

SLIME-MOLD BEETLES OF THE GENUS
AGATHIDIUM PANZER IN NORTH
AND CENTRAL AMERICA,
PART II. COLEOPTERA: LEIODIDAE

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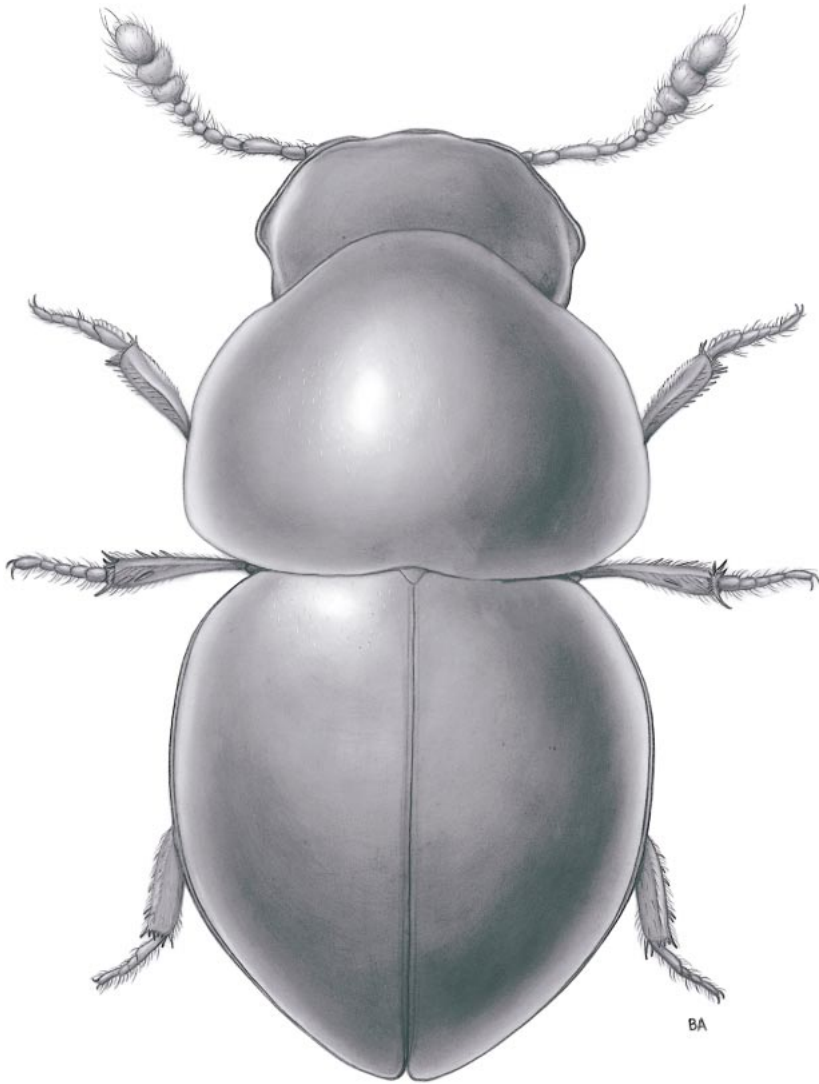
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FRONTISPIECE. Male *Agathidium vaderi*, new species, dorsal habitus. Original by Byron Alexander.

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ABSTRACT

The *Agathidium concinnum*, *A. pulchrum*, *A. compressidens*, *A. iota*, and *A. oniscoides* groups are revised. The following new species are described: *A. akallebregma*, n.sp., *A. akrogeneios*, n.sp., *A. amae*, n.sp., *A. andersoni*, n.sp., *A. appalachium*, n.sp., *A. aztec*, n.sp., *A. bituberculum*, n.sp., *A. bushi*, n.sp., *A. carolinense*, n.sp., *A. chauliodoum*, n.sp., *A. cheneyi*, n.sp., *A. cortezi*, n.sp., *A. disgregum*, n.sp., *A. divaricatum*, n.sp., *A. erythromelas*, n.sp., *A. fawcettae*, n.sp., *A. framea*, n.sp., *A. gallititillo*, n.sp., *A. georgiaense*, n.sp., *A. gomezae*, n.sp., *A. grandidentatum*, n.sp., *A. grumum*, n.sp., *A. hamulum*, n.sp., *A. hidalgoense*, n.sp., *A. hirsutum*, n.sp., *A. hyle*, n.sp., *A. impensum*, n.sp., *A. invisitatum*, n.sp., *A. iota*, n.sp., *A. iridescens*, n.sp., *A. kimberlae*, n.sp., *A. lobosternum*, n.sp., *A. marae*, n.sp., *A. megoniscoides*, n.sp., *A. microphthalmum*, n.sp., *A. multidentatum*, n.sp., *A. nimbosilva*, n.sp., *A. oaxacaense*, n.sp., *A. oculum*, n.sp., *A. oedema*, n.sp., *A. oregonense*, n.sp., *A. pocahontasae*, n.sp., *A. popocatepetlae*, n.sp., *A. potosii*, n.sp., *A. recurvatum*, n.sp., *A. rhamphastes*, n.sp., *A. rumsfeldi*, n.sp., *A. sejunctum*, n.sp., *A. skoliosternum*, n.sp., *A. stenomma*, n.sp., *A. stephani*, n.sp., *A. tenangoense*, n.sp., *A. triangularum*, n.sp., *A. tribulograndum*, n.sp., *A. tribulosum*, n.sp., *A. tumidiventre*, n.sp., *A. vaderi*, n.sp., *A. vesperpressidens*, n.sp. The following new synonyms are proposed: *A. assimile* Fall, *A. municeps* Fall, and *A. falli* Hatch = *A. angulare* Mannerheim, new synonyms; *A. alticola* Fall = *A. athabascanum* Fall, new synonym; *A. contiguum* Fall, *A. varipunctatum* Hatch, and *A. striolum* Hatch = *A. picipes* Fall, new synonyms; and *A. californicum* Horn and *A. alutaceum* Fall; = *A. exiguum* Melsheimer, new synonyms. Lectotypes are designated for the following species: *A. angulare*, *A. californicum*, *A. concinnum* Mannerheim, *A. dentigerum* Horn, *A. difficile* Matthews, *A. effluens* Mannerheim, *A. exiguum*, *A. globatile* LeConte, *A. laetum* Fall, *A. pulchrum* LeConte, *A. rotundulum* Mannerheim, *A. rubellum* Fall, *A. ruficorne* LeConte, and *Phalacrus diffiformis* LeConte.

INTRODUCTION

This is the second of two parts of a taxonomic revision of the species of the genus *Agathidium* Panzer (Coleoptera, Leiodidae) of North and Central America. A general introduction to the revision, a detailed account of the external morphology of a representative species, keys to described New World genera of Agathidiini and species groups within the scope of this study, and a summary of host associations, primarily with Myxomycetes (slime-molds), were presented in part I (Wheeler and Miller, in press), along with taxonomic treatments of the *A. revolvens*, *A. sexstriatum*, and *A. brevisternum* species groups. Below are presented the remaining species in the *A. compressidens*, *A. concinnum*, *A. iota*, *A. pulchrum*, and *A. oniscoides* species groups, and a checklist for all *Agathidium* species of North and Central America.

Materials and methods are the same for this portion of the revision as for part I. For measurements: OHW (ocular head width) = greatest width of head across eyes; MDL (median head length) = head length from base of labrum to posterior margin of cranium; PNW (pronotal width) = greatest width

of pronotum; PNL (pronotal length) = length of pronotum along midline; ELW (elytral width) = greatest width of combined elytra; SEL (postscutellar elytral length) = length of elytra along suture from posterior margin of scutellum to apex; MTL (metasternal length) = length of metasternum along midline; MTW (metasternal width) = greatest width of metasternum; TBL (total body length) = MDL + PNL + SEL.

AGATHIDIUM CONCINNUM SPECIES GROUP

DIAGNOSIS: The group is characterized by the well-developed postocular temporum which extends the lateral margin of the head posteriorly beyond the eye between 0.5 and 1.0 times the eye length (figs. 1–5). The anterior portion of the mesosternum is relatively short, much shorter than the posterior portion which is moderately to strongly concave. The humeral angles of the elytra are relatively angulate.

DISCUSSION: This species group appears to correspond to the subgenus *A. (Cyphocele)* Thomson based on the long temporum. In North America the group contains five species that fall into two subgroups. The first includes



Fig. 1. *Agathidium angulare*, dorsal habitus.

A. akallebregma, *A. angulare*, and *A. mollinum* which share the presence of a male mandibular horn (e.g., figs. 17–20), moderately elongate body shape, and strongly concave posterior portion of the mesosternum. The second group includes *A. hatchi* and *A. concinnum* which are large species (very large in the case of *A. hat-*

chi) and are characterized by the lack of a male mandibular horn, a broad, depressed body form (e.g., fig. 2), and weakly concave posterior portion of the mesosternum. Of course, given the lack of a cladistic analysis it is impossible to say which of these states is derived. However, given the presence of a prominent

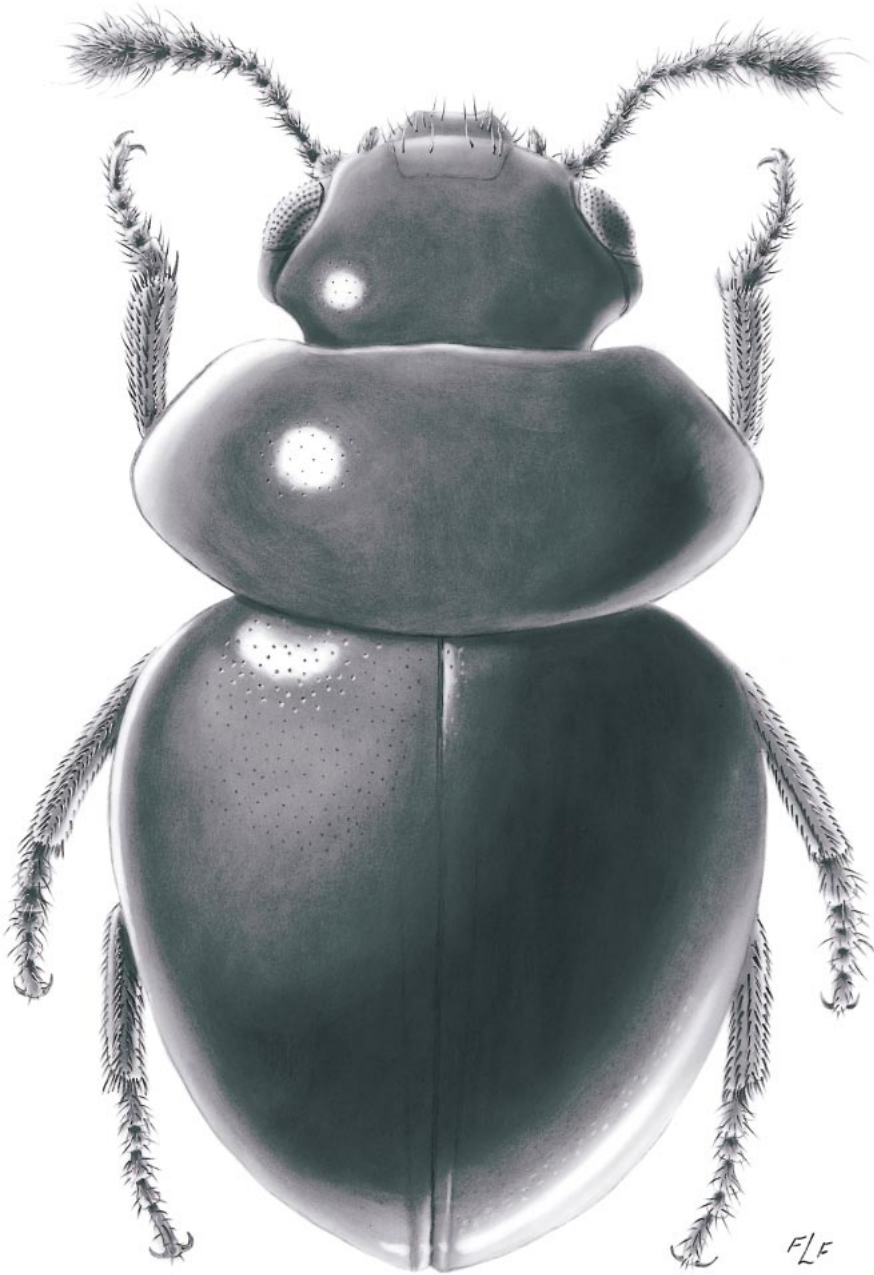
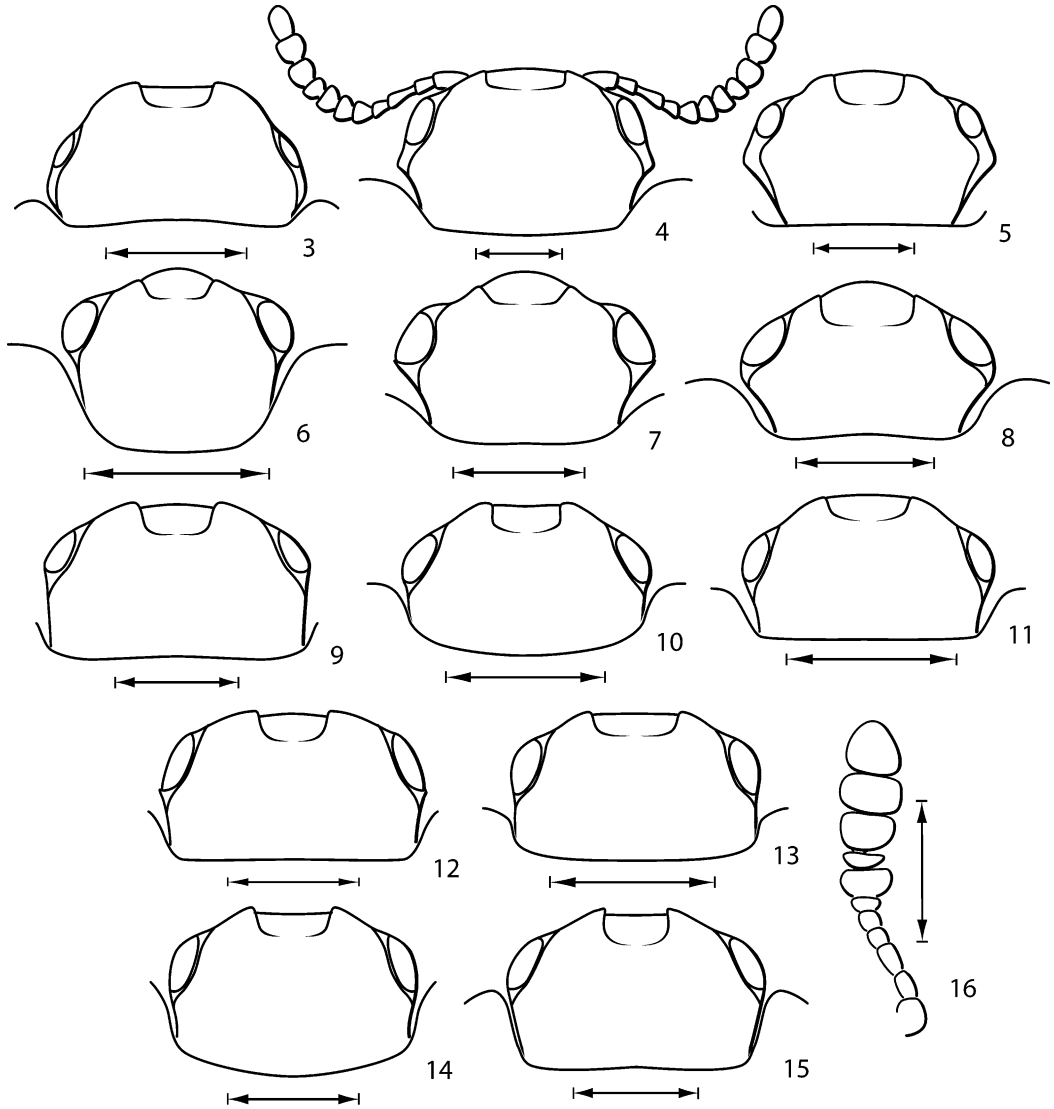


Fig. 2. *Agathidium concinnum*, dorsal habitus.

left mandibular horn in at least some of these species (certainly an apomorphy within the Agathidiini), they may be related to the members of the *A. brevisternum* and *A. pulchrum* species groups (= subgenus *A. (Neoceble) auctorum*). Some species of the *A. pulchrum*

group have a relatively long temporum, even approaching half the length of the eye. The gradational nature of this feature in Nearctic *Agathidium* further suggests that these species groups may not each be monophyletic.

These species occur in far western and



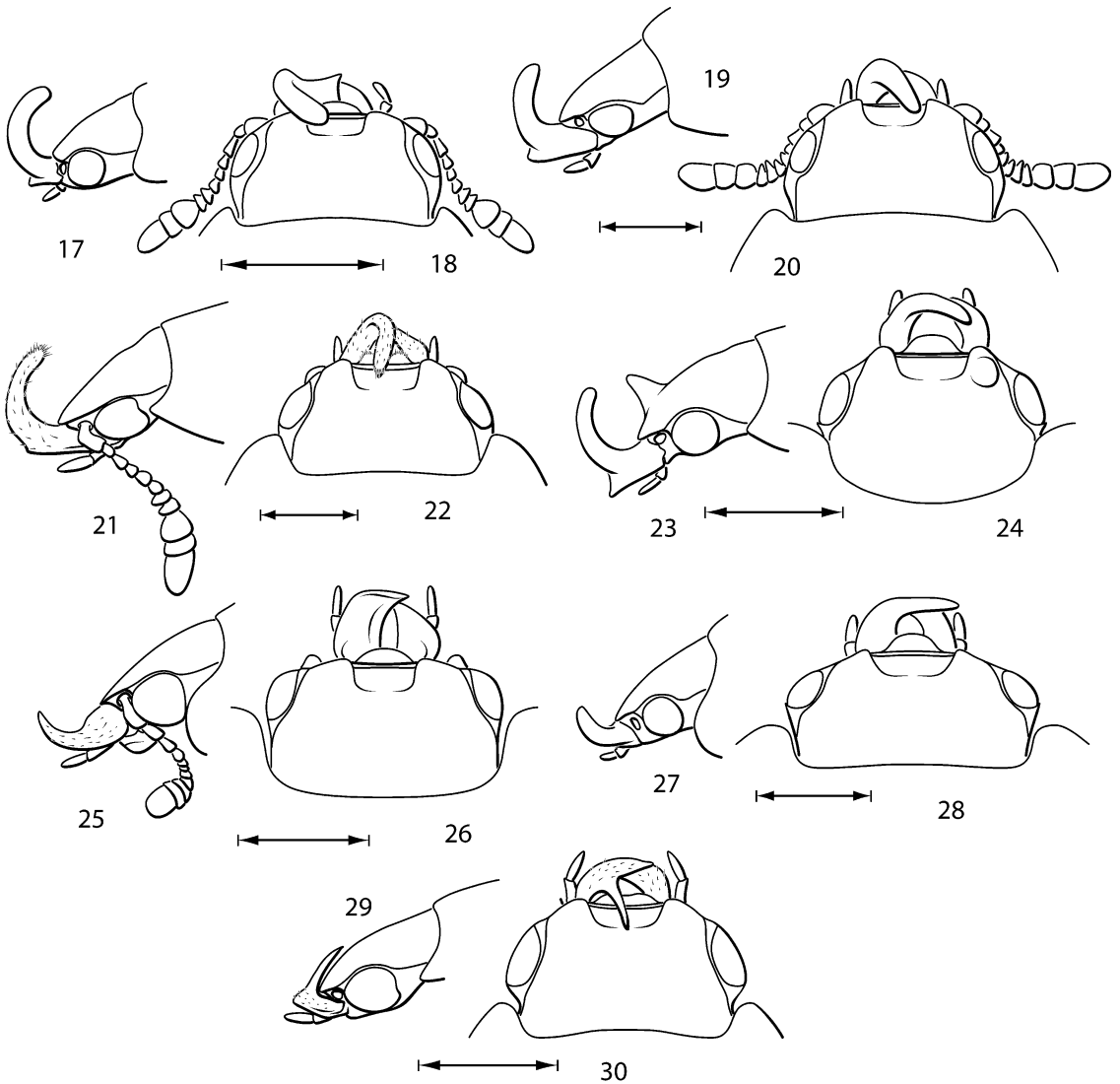
Figs. 3–16. *Agathidium concinnum*- and *A. pulchrum*-group species. 3–15. Heads, dorsal aspect: 3, *A. akallebregma*. 4, *A. hatchi*. 5, *A. concinnum*. 6, *A. laetum*. 7, *A. athabaskanum*. 8, *A. columbianum*. 9, *A. rusticum*. 10, *A. repentinum*. 11, *A. rotundulum*. 12, *A. atronitens*. 13, *A. oregonense*. 14, *A. hamulum*. 15, *A. politum*. 16, *A. rusticum*, left antenna, dorsal aspect. Bars = 0.5 mm, except fig. 16 bar = 0.25 mm.

northern North America east to the northeastern part of the continent.

KEY TO *A. CONCINNUM* SPECIES GROUP

1. Anterior clypeal margin strongly excavated, anterolateral margins of frons extending

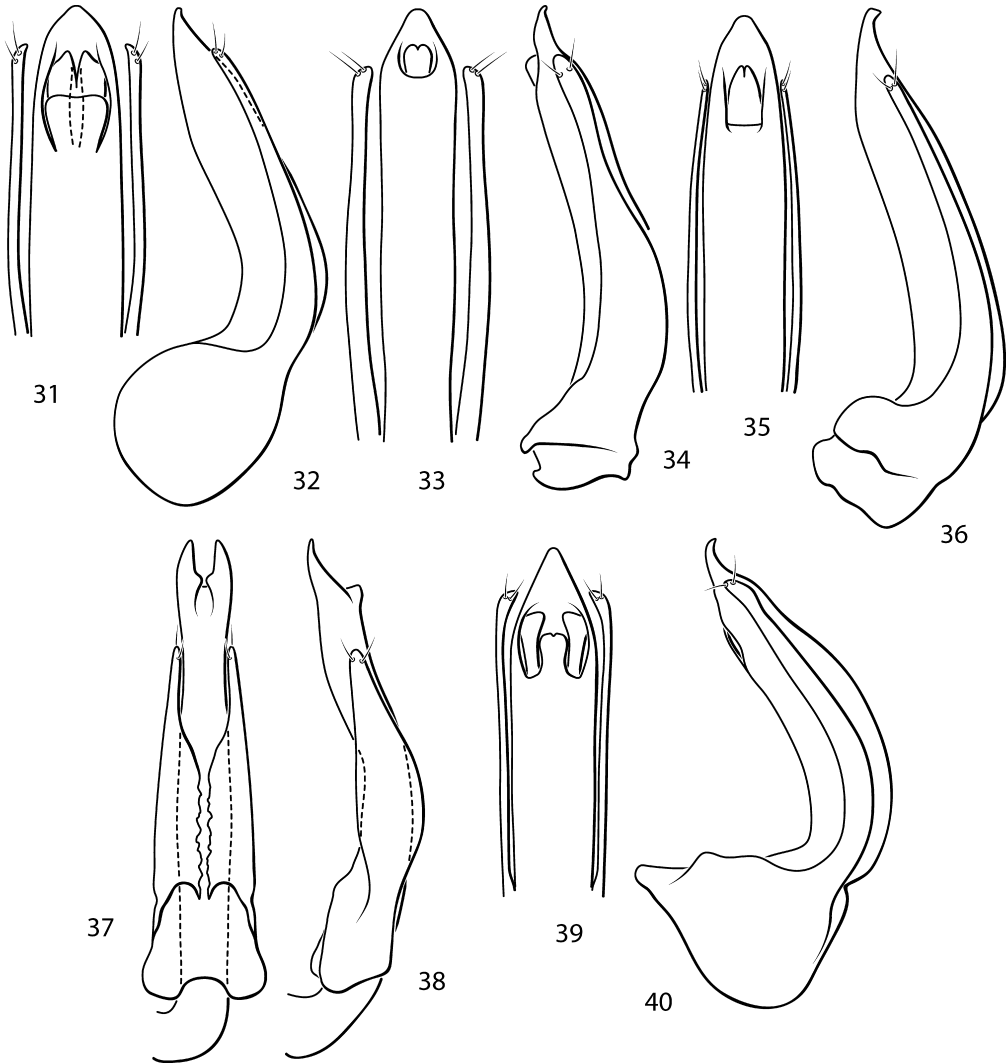
prominently beyond anterior margin of clypeus (figs. 1, 3, 18, 20); posterior portion of mesosternum strongly concave, nearly vertical posteriorly; horn often present on male left mandible (figs. 17–20) 2
 — Anterior clypeal margin not excavated, margin extending to or beyond level of anterolateral margins of frons (figs. 2, 4, 5); posterior por-



Figs. 17–30. *Agathidium concinnum*- and *A. pulchrum*-group species, male heads showing left mandibular horn: 17, 18, *A. mollinum*: **17**, left lateral; **18**, dorsal. 19, 20, *A. angulare*: **19**, left lateral; **20**, dorsal. 21, 22, *A. pulchrum*: **21**, left lateral; **22**, dorsal. 23, 24, *A. marae*: **23**, left lateral; **24**, dorsal. 25, 26, *A. aristerium*: **25**, left lateral; **26**, dorsal. 27, 28, *A. atronitens*: **27**, left lateral; **28**, dorsal. 29, 30, *A. picipes*: **29**, left lateral; **30**, dorsal. Bars = 0.5 mm.

tion of mesosternum concave, but not strongly so, not approaching vertical posteriorly; horn absent on male left mandible 4
 2(1). Anterior surface of head irregular, frons swollen and expanded around margins of clypeus, especially laterad of clypeus *A. akallebregma*, new species
 — Anterior surface of head evenly curved over surface of frons and clypeus, frons not

particularly swollen or only slightly so laterad of clypeus 3
 3(2). Size smaller (TBL < 2.5 mm) ; male mandibular horn when fully developed long, extending from medial surface of mandible in very strong C-shaped curve to left and back over mandible (figs. 17, 18); median lobe of aedeagus in lateral aspect slender and relatively straight, apical por-



Figs. 31–40. *Agathidium concinnum*-group species, aedeagus: 31, 32, *A. akallebregma*: 31, ventral; 32, lateral. 33, 34, *A. mollinum*: 33, ventral; 34, lateral. 35, 36, *A. angulare*: 35, ventral; 36, lateral. 37, 38, *A. hatchi*: 37, ventral; 38, lateral. 39, 40, *A. concinnum*: 39, ventral; 40, lateral.

tion a long slender, pointed process (fig. 34) *A. mollinum* Fall
 — Size larger (TBL > 2.5 mm); male mandibular horn when fully developed long, extending from medial surface of mandible in moderate oblique curve up and to right over clypeus (fig. 19, 20); median lobe of aedeagus in lateral aspect stout, curved and with apical portion slender, curved and with apex abruptly expanded and obliquely truncate (fig. 36)
 *A. angulare* Mannerheim
 4(1). Size very large (TBL > 3.5 mm); antennae

clavate, antennomeres 5–8 similar in width and only slightly less wide than 9–11 (fig. 4); male metafemur unmodified, without tooth; median lobe of aedeagus in ventral aspect very slender, apically prominently divided into two robust, apically pointed rami (fig. 37), in lateral aspect long, slender, irregularly sinuate (fig. 38) *A. hatchi* Wheeler
 — Size often relatively large, but smaller than above (TBL < 3.5 mm); antennae with abrupt, 3-segmented club, antennomeres 5–8 relatively slender; male metafemur

with small, medial tooth along posterior margin (fig. 118); median lobe of aedeagus in ventral aspect broad, apical portion broadly triangular, not prominently divided (fig. 39), median lobe of aedeagus in lateral aspect very robust, broad basally with subbasal constriction, apically tapered to sharp point (fig. 40)
 *A. concinnum* Mannerheim

Agathidium akallebregma Miller and
 Wheeler, new species
 Figures 3, 31, 32, 41

TYPE MATERIAL: Holotype, ♂ in CASC labeled "CALIF: Kern Co. 5 mi. SE Tehachapi XI-9-1984 AJ Gilbert Berlese Oak-Pine duff/HOLOTYPE *Agathidium akallebregma* Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: United States, California, Kern Co., 5 mi SE Tehachapi.

DIAGNOSIS: This species differs from others in this group by the sunken clypeus and raised lateral areas of the frons and the shape of the median lobe of the aedeagus, which has the apex slightly dorsally hooked and narrowly rounded in lateral aspect (fig. 32). The operculum is broad, hyaline, and apparently fused to the median lobe basally (fig. 31).

DESCRIPTION: Body moderate to large (TBL = 2.17–2.64 mm), elongate (PNW/TBL = 0.53–0.48), moderately contractile.

Head dark red; pronotum, elytra, and venter red to dark red; mesosternum yellow; basal antennomeres, palpi, and legs red-brown, antennomeres of club dark brown.

Head very broad (fig. 3) (MDL/OHW = 0.54–0.61), convex, with moderately prominent, transverse, medial crease; tempora prominent in dorsal aspect, 1.0 times eye length, laterally protuberant beyond level of eye in anterior portion (fig. 3); head finely and sparsely to moderately densely punctate, some specimens with interspersed micropunctules, surface between punctures shiny, a few specimens with indistinct, fine microreticulation; eyes large, rounded, finely faceted; frontoclypeal suture indistinct medially; clypeal margin strongly excavate (fig. 3); anterior margin of labrum entire; clypeus impressed with frons around clypeus irregularly raised, especially laterad of clypeus above

antennal insertions, making anterior surface of cranium very irregular, most conspicuous in male; antennomere ratios: length I:II:III = 2.2:1.0:1.2, width VII:VIII:IX = 1.0:1.0:1.3. Pronotum broad (PNL/PNW = 0.52–0.59), laterally not strongly produced, anterolateral angle subquadrate to rounded, posterolateral angle distinctive, but somewhat more rounded than anterolateral angle; punctation similar to that of head, slightly more dense. Elytra moderately elongate (SEL/ELW = 0.91–0.92); punctation coarsely and densely punctate, with larger punctures and many small micropunctules interspersed, some coarse punctures forming irregular longitudinal series; sutural stria about one-half length of elytron on most specimens. Mesosternum concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.30–0.31), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with moderately large ventral field of spatulate setae; mandibular modification present in both males examined, apex of mandible broadly expanded and truncate; metafemur moderately slender, unmodified; metasternal fovea large, anterior, transversely oval with large brush of long, fine, dense setae. Median lobe of aedeagus in lateral aspect large, moderately robust, with robust, expanded basal portion and submedially constricted, apical portion narrowed to fine, slightly dorsally directed point (fig. 32); in ventral aspect moderately broad, lateral margins slightly convergent apically, apical portion broadly triangular, apex pointed, orifice very large (fig. 31); operculum consisting of a triangular, hyaline lobe (fig. 31); endophallus with prominent, long, medial spine visible in orifice (fig. 31); lateral lobes long, slender, curved basally, apices narrowly rounded with 2 long setae (figs. 31, 32).

Female tarsi 5-4-4.

ETYMOLOGY: Named from the Greek words *akalles*, meaning "ugly", and *bregma*, meaning "face", for the unusually shaped anterior portion of the head in this species.



Fig. 41. Geographic distribution of *Agathidium concinnum*-group species: *A. akallebregma* = ■; *A. mollinum* Fall = ▲ (△ = state record only).

DISTRIBUTION: This species is known from only two localities in California and Oregon (fig. 41).

PARATYPES: UNITED STATES: *California:* Kern Co.: 5 mi SE Tehachapi, 8 Nov 1984, oak-pine duff, AJ Bilbert (3, FGAC). *Oregon:* Jackson Co.: 7 mi N Ashland, 27 Dec 1971, 3500', oak brush duff, E Benedict (1, PECK).

DISCUSSION: This species has been collected from oak and oak-pine duff. A single elevation record is from 3500 ft.

Agathidium mollinum Fall
Figures 17, 18, 33, 34, 41

Agathidium mollinum Fall, 1934b: 128.

TYPE MATERIAL: Holotype, ♂ in MCZC labeled "Wt. Mts. N. H. Woods/♂/Agathidium politum Lec [handwritten]/M.C.Z. Type 19570 [number handwritten, red label]/Frederick Blanchard Collection/Agathidium mollinum Fall TYPE [handwritten]".

TYPE LOCALITY: United States, New Hampshire, White Mountains.

DIAGNOSIS: Individuals of this species are smaller than those of most species in this group (TBL < 2.5 mm). The male mandibular horn varies from small and extending from medial surface of left horn laterad to right over right mandible to very long and extending in broad C-shaped curve to left and back over left mandible (figs. 17, 18). The male metasternal fovea is linear, long, transverse, and submedial. The median lobe of the aedeagus is long and slender in lateral aspect with the apex simple (fig. 34).

DESCRIPTION: Body small to moderately large (TBL = 2.24–2.48 mm), robust (PNW/TBL = 0.47), moderately contractile.

Head, pronotum, and elytra dark red-brown; venter red-brown to dark brown; basal antennomeres, palpi, and legs red-brown.

Head broad (fig. 18) (MDL/OHW = 0.54–0.69), flattened, without transverse, medial crease; temporum prominent, about 0.6–1.0 times eye length when viewed in dorsal aspect (fig. 18); head finely and sparsely punctate, surface between punctures shiny, a few specimens with indistinct, fine microreticulation; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin strongly excavate (fig. 18); anterior margin of labrum entire;

antennomere ratios: length I:II:III = 2.0:1.0:1.5, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum broad (PNL/PNW = 0.54–0.56), laterally not strongly produced, anterolateral angle subquadrate to rounded, posterolateral angle distinctive, but rounded; punctation and surface microsculpture similar to that of head. Elytra moderately elongate (SEL/ELW = 1.14–1.18); punctation similar to pronotum, some punctures in vague linear series, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.25–0.34), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with moderately large ventral field of spatulate setae; left mandible in three forms: (1) unmodified, (2) thickened and prominently extending to the right over other mandible, and (3) extremely long, cylindrical and curving broadly to left and back up over mandible (figs. 17, 18), with this last type setose and with prominent apical fovea and cluster of setae; metafemur moderately slender, unmodified; metasternal fovea large, transversely linear and slightly curved, located slightly anterad of middle. Median lobe in lateral aspect moderately slender, slightly curved medially, base not large, apical portion short, narrowed, apically slightly truncated, directed slightly dorsad (fig. 34); in ventral aspect slender, lateral margins subparallel, apical portion subtriangular, apex rounded (fig. 33); operculum short, comprised of two short lobes (fig. 33); lateral lobes broad at base, broadly fused dorsally for about one-half length of median lobe, apically slender and straight, apically pointed with 2 long setae. (figs. 33, 34).

Female tarsi 5-4-4.

DISTRIBUTION: This species is known from eastern North America from Ontario to New Hampshire and Maine south to North Carolina (fig. 41).

SPECIMENS EXAMINED: CANADA: *Ontario:* 25

km W Ignace, 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (2, CNCI); Lake Superior Prov. Park, Algoma Co., 9 Sep 1980, R Baranowski (4, LUND).

UNITED STATES: *Maine*: "Tang Lo"??, Aug 1894 (1, MCZC). *Michigan*: state only (1, CMNH). *New Hampshire*: Carrol Co.: 1 mi N Wonalancet, 7 Aug 1985, FIT, DS Chandler (2, CNCI); The Bowl, 2.5 mi NW Wonalancet, 2 Jul 1985, FIT, DS Chandler (4, CNCI); Coos Co.: 1 mi NE East Inlet Dam, 8 Aug 1986, DS Chandler (1, CNCI); Mt Washington auto road, 1 Jul 1982, 2700', birch litter, DS Chandler (1, DENH); Norton Pool 2 mi E East Inlet Dam, 7 Sep 1984, leaf litter, fallen spruce, DS Chandler (17, CNCI); Norton Pool, 3 mi NE East Inlet Dam, 9 Jul 1986, conifer logs, DS Chandler (3, CNCI). *New York*: Albany Co.: Rensselaerville, E.N. Huyuck Preserve, 18 Aug 1974, birch log, WR Suter (1, PECK); Sullivan Co.: Mangoup Lake, 3 mi N DeBruce, 22 May 1968, litter, Berlese, S Peck (1, PECK). *North Carolina*: Jackson Co.: Blue Ridge Parkway, Hayward Gap, 5 Jun 1984, FIT, S Marshall (2, PECK); Swain Co.: 14 Sep 1985, 5800', on *Cribraria purpurea*, SL Stephenson (7, CUIC); Yancey Co.: Mt Mitchell, 31 May 1973, fern rhizome, WR Suter (1, PECK). *Virginia*: Giles Co.: 18 Jun 1986, 3700', on *Stemonitis axifera*, SL Stephenson (3, CUIC); 6 Oct 1984, on *Diderma floriforme*, SL Stephenson (1, CUIC).

DISCUSSION: This species has been collected from litter from various sources including birch, fir, maple, and "conifer". It has also been collected from "fern rhizome" and in flight intercept traps. Host records include the myxomycetes *Cribraria purpurea*, *Diderma floriforme*, and *Stemonitis axifera*.

Agathidium angulare Mannerheim

Figures 1, 19, 20, 35, 36, 42

Agathidium angulare Mannerheim, 1852: 369; Horn, 1880; Leng, 1920; Fall, 1934b.

Agathidium assimile Fall, 1934b: 128. NEW SYNONYM.

Agathidium temporale Fall, 1934b: 127 (preoccupied by Sahlberg, 1908, replaced by Fall, 1934a).

Agathidium municeps Fall, 1934a: 171 (replacement name for *Agathidium temporale* Fall, 1934b *nec* Sahlberg, 1908). NEW SYNONYM.

Agathidium falli Hatch, 1957: 32 (unnecessary replacement name for *Agathidium temporale* Fall, 1934b *nec* Sahlberg, 1908). NEW SYNONYM.

TYPE MATERIAL: *Agathidium angulare*: lectotype (designated here to fix this name

with this species), ♂ in MCZC labeled "93/Type 7946 [red label]/A. angulare Sitkha Mannh. [handwritten]". Horn (1880) and Fall (1934b) each mentioned multiple type specimens, and Mannerheim (1852) seemed to imply he had more than one specimen when he described this species. We selected the male specimen in MCZC as the lectotype.

Agathidium assimile: holotype, ♂ in MCZC labeled "Ind./Ind'apolis 7/14/10/♂/TYPE assimile [name handwritten, red line under "TYPE"]/M.C.Z. Type 19571 [number handwritten, red label]/H.C. FALL COLLECTION." There are three paratypes (one male, two females) from Mt. Washington, New Hampshire.

Agathidium temporale: holotype, ♂ in MCZC labeled "Randolph Hill. N.H. '04-IX J.D.S. [handwritten]/♂/near difforme clypeal [handwritten, with other words illegible]/Tarsi 5-5-4 [handwritten]/M.C.Z. Type 19573 [number handwritten, red label]/Frederick Blanchard Collection/Agathidium temporale Fall TYPE [handwritten]/replacements: municeps Fall '34 falli Hatch '57 [handwritten]/Agathidium temporale Fall [handwritten, red line around border]". There is one female paratype from North Conway, New Hampshire.

TYPE LOCALITY: *Agathidium angulare*: United States, Alaska.

Agathidium assimile: United States, Indiana, Indianapolis.

Agathidium temporale: United States, New Hampshire, Randolph.

DIAGNOSIS: This species is diagnosed by its relatively large size (TBL > 2.5 mm), long male mandibular horn (when present and fully developed) that extends from the medial surface of the mandible in a moderate, oblique curve up and to right over the clypeus (figs. 19, 20), and male with the median lobe of the aedeagus in lateral aspect stout, curved, and with the apex abruptly anvil-shaped and truncate (fig. 36).

DESCRIPTION: Body moderate to large (TBL = 2.59–3.32 mm), elongate (PNW/TBL = 0.46–0.49), moderately contractile.

Head dark red; pronotum, elytra and venter red to dark red; mesosternum yellow; basal antennomeres red-brown, club antennomeres dark brown; palpi and legs red-brown.

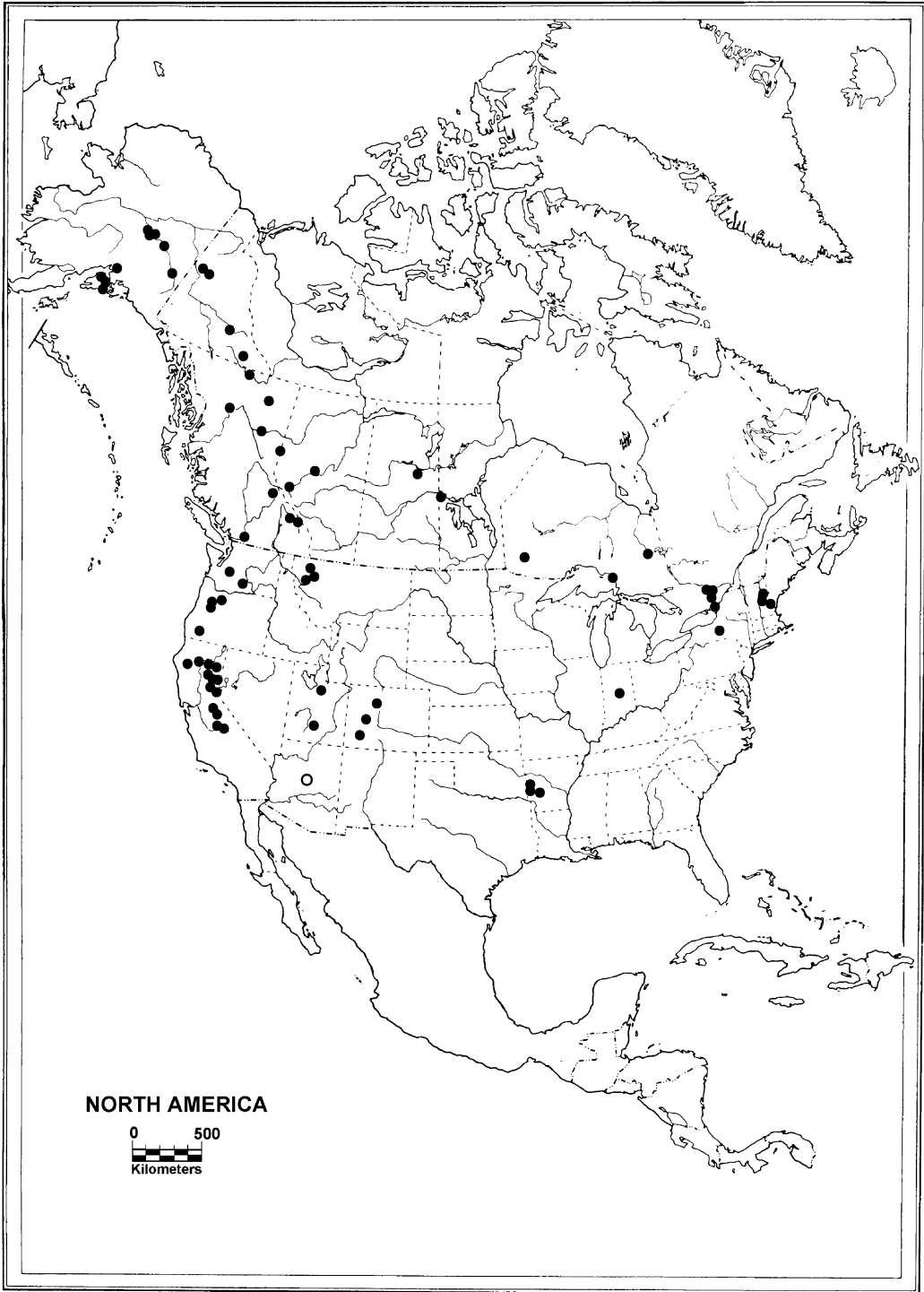


Fig. 42. Geographic distribution of *Agathidium angulare*.

Head very broad (figs. 1, 20) (MDL/OHW = 0.62–0.73), convex, without transverse, medial crease; temporum prominent, about 0.6 to 1.0 times eye length when viewed in dorsal aspect (figs. 1, 20); head finely and sparsely to moderately densely punctate, some specimens with interspersed micropunctules, surface between punctures shiny, a few specimens with indistinct, fine microreticulation; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin strongly excavate (figs. 1, 20); anterior margin of labrum entire; antennomere ratios: length I:II:III = 2.3:1.0:1.4, width VII:VIII:IX = 1.1:1.0:2.5. Pronotum broad (PNL/PNW = 0.55–0.57), laterally not strongly produced, anterolateral angle subquadrate to rounded, posterolateral angle distinctive, but rounded; punctuation similar to that of head. Elytra moderately elongate (SEL/ELW = 1.01–1.20); punctuation coarser than that of pronotum, some specimens relatively densely punctate, others more sparse, some specimens with numerous micropunctules between larger punctures; sutural stria about three-fifths length of elytron on most specimens. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.33–0.35), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with moderately large ventral field of spatulate setae; mandibular horn, when fully developed, very long, curving anteriorly, then posteriorly over front of head (figs. 19, 20), subcircular throughout in cross-section, punctate and setose along its length, apical fovea prominent with large cluster of setae, some specimens with mandible variously thickened, others without modification; metafemur moderately slender, unmodified; metasternal fovea small, round, anterior, moderately large brush of fine, dense setae. Median lobe in lateral aspect large, moderately robust, strongly curved basally with slight constriction, lateral margins evenly converging, apical portion flat, slender, curved dorsad, apex abruptly expanded (fig. 36); in ventral aspect mod-

erately broad, lateral margins subparallel, apical portion triangular, apex pointed, orifice large (fig. 35); operculum long and moderately broad, apically narrowly emarginate, inconspicuous and hyaline (fig. 35); lateral lobes long, slender, curved basally, apices rounded with 2 long setae (figs. 35, 36).

Female tarsi 5-4-4.

DISTRIBUTION: This species is widespread across northern North America from Alaska to New Hampshire and south in western North America to Arizona (fig. 42). Records from Indiana and Arkansas suggest that the species may be even more widespread than records indicate.

SPECIMENS EXAMINED: "W.T." [probably Washington Territory] (1, MCZC).

CANADA: *Alberta*: Demmitt, 3 km W 90 km NW Grand Prairie, 12 Jun 1984, poplar forest, FIT, S and J Peck (1, PECK); 3.8 mi N Cadomin, 4 Aug 1985, lodgepole pine forest, FIT, RS Anderson (40, CNCI); Sibbold Flats Rec. Area, 6 Sep 1981, FIT, RS Anderson (10, CNCI); George Lake 50 km NW Edmonton, 11 Jun 1984, spruce-aspen forest, FIT, S and J Peck (2, CNCI). *British Columbia*: Pink Mountain 252 km S Ft Nelson, Rt 97, 12 Jun 1984, aspen forest, FIT, S and J Peck (14, PECK); Lorna, 17 Aug 1934, R Hopping (1, CASC); Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, RS Anderson (10, PECK); Bear Lake, 20 Aug 1969, sifting, BF and JL Carr (1, CARR); 37 km W Ft Nelson, Ak Hwy, 12 Jun 1984, aspen-spruce forest, FIT, S and J Peck (12, PECK); Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, RS Anderson (44, CNCI); 14 km E Coal River, 160 km E Watson Lake, YT, 14 Jun 1984, spruce-alder forest, malaise FIT, S and J Peck (12, PECK); 5.6 mi E E Border Glacier Natl Park on #1, 11 May 1984, Columbia forest, RS Anderson (3, CNCI); Mount Robson Prov. Park, Berg Lake Trailhead, 4 Jul 1984, cedar/hemlock forest litter, RS Anderson (1, PECK); Kootenay Natl Park, 17 Jul 1985, on *Stemonitis*, SL Stephenson (3, AMNH); Pink Mt, 252 km S Ft Nelson, rt 97, 5 Jun 1984, aspen forest, FIT, S and J Peck (10, CNCI); Stanley, 19 Jul 1932, N Graham (2, CASC); Manning Prov. Park, 19 Jun 1979, alpine meadow, pitfall traps, CD Dondale (20, CNCI); Lorna, 19 Jul 1926, H Richmond (1, CASC). *Manitoba*: Grass River Prov. Park, 100 rd km SE FlinFlon, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (4, CNCI); Grass Riv. Prov. Park, 100 rd KM SE FlinFlon, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (2, PECK). *Ontario*: Stittsville, 5 Sep 1976, M Sanborne (1, PECK); 25 km W Ignace, 75 km E Dryden, 5 Jun

1984, fir-maple forest, FIT, S and J Peck (1, PECK); Kemptville, 2 Oct 1984, BRI staff (1, CNCI); Gloucester, 15 Sep 1984, M Sanborne (1, CNCI); Chaffey Locks QUSB, 5 Oct 1980, forest, malaise FIT, S Peck (16, CNCI); Smooth Rock Falls 56 km NW Cochrane, 3 Jun 1984, mixed spruce-birch, evening car netting, S and J Peck (1, PECK); Haley Sta. 15 km NW Refrew, 2 Nov 1979, mixed forest, malaise, S and J Peck (1, CNCI); Lake Superior Prov. Park, Algoma Co., 9 Sep 1980, R Baranowski (1, LUND); 25 km W Ignace, 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (1, CNCI); Stittsville, DA Smith's woods, 18 Oct 1979, forest, malaise FIT, S Peck (3, CNCI). *Quebec*: Hull, Gatinaeu Park, nr Pinks Lake, 30 Jun 1979, for. Mal. Trough, S Peck, A Davies (5, PECK); Gatineau Park nr Pinks Lake, 1 Oct 1979, forest, malaise, S Peck, A Davies (10, CNCI); Masham, Lac Philippe, Gatineau, 13 Dec 1981, on *Brefeldia maxima*, S Peck (21, CNCI); Hull, Gatinaeu Park, nr Pinks Lake, 24 Jun 1979, for. Mal. Trough, S Peck, A Davies (7, PECK); Masham lac Philip, Gatineau, 13 Sep 1981, reared from larvae, on *Brefeldia maxima*, S Peck, A Newton (3, FMNH). *Saskatchewan*: Jay Jay Lake Rt 102, 130 km NE Candle Lake, 8 Jun 1984, pine-fir forest, FIT, S and J Peck (1, CNCI); Jay Jay Lake, Rt 102, 130 km NE Candle Lake, 8 Jun 1984, pine-fir forest, FIT, S and J Peck (4, PECK). *Yukon*: Dawson City, km 45 Kondike Hwy, 9 Jul 1985, cut willow, *Equisetum*, FIT, SA Marshall (1, PECK); Engineer Creek Dempster Hwy, km 194, 19 Jun 1984, spruce-aspens forest, car top, S and J Peck (1, PECK); Ross River, 16 Jun 1984, aspen-willow, river terrace, malaise FIT, S and J Peck (9, PECK); Dempster Jct 40 km E Dawson, 19 Jun 1984, willow-spruce forest, malaise FIT, S and J Peck (26, PECK); Dempster Hwy, Tombstone Mtn Camp, 5 Jul 1985, willow shrub, FIT, SA Marshall (2, PECK); km147 Dempster Hwy, 6 Jul 1985, fen willows-spruce dung pan trap, SA Marshall (1, PECK); Simpson Lake, 81 km N Watson Lake, 15 Jun 1984, pine-willow forest, malaise FIT, S and J Peck (9, PECK); Moose Creek, 14 km NW Stewart Cross., 18 Jun 1984, stream willow thicket, malaise FIT, S and J Peck (20, PECK); Dempster Jct 40 km E Dawson, 19 Jun 1984, willow spruce forest, malaise FIT, S and J Peck (1, CNCI); Engineer Creek, Dempster Hwy km 194, 19 Jun 1984, willow spruce forest, malaise FIT, S and J Peck (1, CNCI); Engineer Creek, Dempster Hwy, km 194, 19 Jun 1984, aspen-spruce forest, FIT, S and J Peck (38, PECK); Ross River, 16 Jun 1984, aspen willow river terrace, malaise FIT, S and J Peck (6, CNCI).

UNITED STATES: *Alaska*: Chatanika Hwy 6, Chatanika River, 13 Aug 1984, floodplain birch

forest litter, Berlese, S and J Peck (2, PECK); Houston, 24 Jun 1984, spruce-birch forest with moss, FIT, S and J Peck (8, PECK); Kenai Pen, E Skilak Rd Jct Rt 1, 25 Jun 1984, aspen-spruce forest, malaise FIT, S and J Peck (17, PECK); Nenana, 13 mi NE Rt 3, mi 318, 27 Jul 1984, birch-spruce forest, malaise FIT, S and J Peck (9, PECK); 15 mi N Fox 30 mi N Fairbanks, 30 Jul 1984, mixed birch woods, malaise FIT, S and J Peck (14, PECK); 11 mi S Anderson Jct Rt 3 mi 270, 23 Jun 1984, alder, poplar, spruce, FIT, S and J Peck (40, PECK); Chena Ridge Rd, 5 mi W Fairbanks, 22 Jun 1984, poplar forest, malaise FIT, S and J Peck (33, PECK); Houston, 24 Jun 1984, spruce-birch forest with moss, malaise FIT, S and J Peck (33, PECK); Kenai Pen, Tern Lake, Jct, rts 1 & 9, 25 Jun 1984, poplar, spruce, alder, malaise FIT, S and J Peck (23, PECK); Tok, 21 Jun 1984, spruce-poplar, FIT, S and J Peck (9, PECK); Chena River Rec. Area 30 mi E Fairbanks, 22 Jun 1984, spruce forest, malaise FIT, S and J Peck (5, PECK); 11 mi S Anderson Jct Rt 3 mi 270, 23 Jun 1984, alder, poplar, spruce, malaise FIT, S and J Peck (2, PECK); Big Delta, 21 Jun 1984, spruce-willow, malaise FIT, S and J Peck (43, PECK); Seward, Salmon Creek, 26 Jun 1984, mature poplar-spruce, malaise FIT, S and J Peck (12, PECK); Kenai Pen. Tern Lake Jct Rts 1 & 9, 25 Jun 1984, poplar-spruce-alder, malaise FIT, S and J Peck (4, PECK); Chena Ridge Rd, 5 mi W Fairbanks, 27 Jul 1984, birch-spruce forest, FIT, S and J Peck (17, CNCI); Seward, Salmon Creek, 26 Jun 1984, mature poplar-spruce forest, malaise FIT, S and J Peck (9, CNCI); Alaska Hwy 12 mi N Tok, 14 Jul 1985, carrion trap, SA Marshall (1, PECK); Ellito Hwy mi 27.8 White Mtn Trail, 16 Jul 1985, mushroom trap, SA Marshall (1, PECK); 15 mi N Fox 30 mi N Fairbanks, 30 Jul 1984, mixed birch woods, malaise FIT, S and J Peck (1, CNCI); Chena Ridge Rd, 5 mi W Fairbanks, 27 Jul 1984, birch-spruce forest, malaise FIT, S and J Peck (1, CNCI); Bonanza Creek Extension Forest nr Fairbanks, 12 Jul 1989, on *Stemonitis* sp., SL Stephenson (6, CUIC); Chena River Rec. Area, 30 mi E Fairbanks, 22 Jun 1984, spruce forest, malaise FIT, S and J Peck (16, PECK); Chena Hot Springs, mi 50 Hot Springs Road, 28 Jul 1984, open spruce-moss taiga, malaise FIT, S and J Peck (1, PECK); campus woods, Univ. Alaska, Fairbanks, 30 Jul 1989, on *Fuligo septica*, SL Stephenson (19, CUIC). *Arizona*: (1, MCZC). *Arkansas*: Montgomery Co.: Crystal Rec. Area S campground, 27 Sep 1991, deciduous forest, C Carlton (1, LSAM); Polk Co.: Caney Creek Wild. Area 3.5 mi N Bard Springs, 20 Jan 1992, beech-maple, Berlese, C Carlton (1, LSAM); Caney Creek WA Sugar Creek, 4 Oct 1993, C Carlton (1, LSAM); Scott Co.: Hogan Mt.

Turkey Area, 19 Oct 1991, deciduous forest, C Carlton (2, LSAM). *California*: Mohawk, Jun 1925, Fenyes (1, MCZC); Sugar Pine, Fenyes (1, CASC); Sta Cruz Mts (5, CASC); colr. (7, MCZC); Mohawk, Jun (1, CASC); Mohawk (3, CASC); Tuolumne Meadows, 7 Jul 1916 (1, MCZC); Amador Co.: 1 mi W Pine Grove, 24 Jun 1975, leaf litter, mixed conifer hardwood forest, A Newton, M Thayer (1, MCZC); Butte Co.: Garland Rd, 2 mi E Hwy 32, 27 Feb 1986, on *Polyporus* sp. on *Quercus kelloggii*, F Andrews, A Hardy, T Eichlin, D Mayhew (1, FGAC); 5 mi NE Butte Mdws, Cherry Hill Cpgd, 7 May 1976, FG Andrews (2, FGAC); Fresno Co.: Shaver Lake Heights, 26 Oct 1972, under bark, pine stump, AJ Gilbert (2, FGAC); Nevada Co.: 14.2 mi SW Alleghany, 4 Apr 1985, under *Pinus* bark, Andrews, Hardy (1, FGAC); Placer Co.: Carnelian Bay, Lake Tahoe, 24 Jun 1964, DF Veirs (1, MCZC); Plumas Co.: 14 Jun 1913 (1, MCZC); Butte Valley Dam, 30 Jun 1975, 4000', under bark conifer, A Newton, M Thayer (2, MCZC); Sierra Co.: Yuba Pass, 20 Jul 1983, 6700', F Andrews, A Hardy (2, FGAC); Tehama Co.: 10 mi SE Mineral, 4 Sep 1961, JF Lawrence (1, MCZC); Trinity Co.: 5 mi SE Peanut, 21 May 1973, under bark, *Pinus ponderosa*, J Doyen (2, EMEC); Tulare Co.: Sequoia Natl Park, Halstead Creek, 23 May 1984, 7000', R Baranowski (1, LUND). *Colorado*: Silverton, Jul 1934, Carpenter (1, MCZC); Grand Co.: 21 Aug 1983, 9600', on cream-colored plasmodium, SL Stephenson (2, CUIC); Gunnison Co.: 17 Aug 1983, 10,700', on orange-yellow plasmodium, SL Stephenson (13, CUIC); 17 Aug 1983, 10,700', on *Fuligo septica*, SL Stephenson (33, CUIC). *Indiana*: Indianapolis, 14 Jul 1910 (1, MCZC). *Montana*: Flathead Co.: Swan Lake, 2 Jul 1989, on *Stemonitis axifera*, SL Stephenson (1, CUIC); 27 Jun 1985, 6700', on *Comatricha* sp., SL Stephenson (2, CUIC); Lake Co.: 29 Jun 1985, on *Stemonitis* sp., SL Stephenson (10, CUIC). *New Hampshire*: Subalpine, Mt Washington, 4 Jul 1896 (3, MCZC); N Conway, Jun (1, MCZC); Mt Washington, 8 Sep 1926, Darlington (1, MCZC); Randolph, Sep 1904, JDS (1, MCZC); Mt Chocoura, 24 Jun 1932 (1, MCZC); Carr. Co.: The Bowl, 2.5 mi NW Wonalancet, 18 Sep 1985, FIT, DS Chandler (6, CNCI); 1 mi N Wonalancet E Park Spring Br, 18 Sep 1985, FIT, DS Chandler (2, CNCI); Coos Co.: Norton Pool, 3 mi NE East Inlet Dam, 22 Aug 1986, FIT, DS Chandler (13, CNCI); Straf Co.: Hubbard Brook Exp For., Bear Brook, 6 Jul 1983, rotten wood, DS Chandler (1, DENH). *New York*: Tompkins Co.: Ithaca, 17 Oct 1976, on Myxomycetes, T Hlavac (1, MCZC). *Oregon*: 5 mi NE Newberg, 14 Nov 1968, light trap, Anderson and Goeden (1, RLWE); Grants Pass, 2 Oct 1965, K Goeden

(2, RLWE); Benton Co.: Mary's Peak, 17 May 1983, 3500', Ribes litter, DS Chandler (1, DENH); Mary's Peak, 20 Jun 1970, on polyporous fungus, RL Westcott (1, RLWE); Clackamas Co.: 10 mi N 10 mi E Gout Camp, Mt Hood rd 5-31, 30 Aug 1972, 5500', hemlock litter, Benedict (6, PECK); Clackamas Co.: 1.5 mi S jct US 26 Ore. 35, 11 Jul 1975, litter, mixed conifer forest, Berlese, A Newton, M Thayer (1, MCZC). *Utah*: Garfield Co.: Aquarius Plateau, Bluebell Knoll, Mar 1986-Sep 1986, pitfall trap, AJ Gilbert (23, FGAC); Wasatch Co.: Lost Lake Camp, Uinta Mountains, 29 Aug 1940, 7800', HP Chandler (1, CASC). *Washington*: Pierce Co.: Mt Rainier Natl Park 4.7 mi W Longmire, 26 Jul 1975, 2200', on *Fuligo septica*, A Newton, M Thayer (2, MCZC); Yakima Co.: 8 mi SW Tieton RS, Snoqualmie NF Bear Creek, 11 Jun 1973, WJ Turner (17, WSUC).

DISCUSSION: This species has been described several times based on supposed degree of angulation of the lateral corners of the pronotum, type of dorsal punctation, and presence or absence of a male mandibular horn. We are unable to find any significant differences in degree of angulation between any of the many specimens examined, including the type specimens of *A. angulare*, *A. municeps*, and *A. assimile*. There are some differences in the type of punctation, however. Dorsal punctation of the elytra and, to a lesser extent, the pronotum and head vary from relatively coarse and sparse to very fine and dense. Specimens from the eastern portion of the range (such as from where *A. municeps* was described) are often much more finely and densely punctate. However, male genitalia and other characters such as the nature of the metasternum and male metasternal fovea agree in all the populations studied throughout the range of the species, and punctation tends to be quite variable within as well as among populations, suggesting that this character is not useful for delimiting species. Therefore, we have synonymized *A. angulare*, *A. municeps*, and *A. assimile*. *A. angulare* has priority. Interestingly, although Hatch advised Fall that *A. temporale* was preoccupied (Fall, 1934a), and Hatch knew of Fall's (1934a) replacement of *A. temporale* Fall with *A. municeps* (Hatch, 1936), he still erected a new replacement name, *A. falli* (Hatch, 1957), although by this time it was unnecessary.

This species has been collected during every month. The species occurs in a broad variety of forest types and has been collected in a number of trap types including flight intercepts, pitfalls, and "carrion traps". Elevation records are from 2200 ft (Washington) to 10,700 ft (Colorado). Host records from specimen labels include: *Brefeldia maxima*, *Comatricha* sp., *Fuligo septica*, *Stemonitis axifera*, *Stemonitis* sp., *Polyporus* sp., and from "cream-colored" and "orange-yellow" plasmodia.

Agathidium hatchi Wheeler

Figures 4, 37, 38, 43

Anisotoma fenderi Hatch, 1957: 32.

Agathidium hatchi Wheeler, 1977: 137 (new combination, replacement name for *Agathidium fenderi* (Hatch, 1957, *Anisotoma*), preoccupied by *Agathidium fenderi* Hatch, 1957).

TYPE MATERIAL: Holotype, ♀ in OSAC, examined by the second author (Wheeler, 1977).

TYPE LOCALITY: United States, Oregon, Ocean Park.

DIAGNOSIS: This species differs from others by its very large size (TBL > 3.5 mm), clavate antennae (antennomeres 5–11 gradually widening) (fig. 4), unmodified male metafemur (without teeth) and very distinctive median lobe which is long, slender, irregularly sinuate, and has the apex bifid in ventral aspect (figs. 37, 38).

DESCRIPTION: Body very large (TBL = 3.77–4.14 mm), broad (PNW/TBL = 0.53–0.55), laterally broadly rounded, somewhat contractile.

Head, pronotum, and elytra red-brown; venter red-brown, darker on metasternum; antennae brown, club dark brown; palpi brown; legs yellow-brown.

Head broad (fig. 4) (MDL/OHW = 0.66–0.67), flattened, without transverse, medial crease; tempora very prominent, about length of eye when viewed in dorsal aspect, extending laterad beyond level of eye at posterior end (fig. 4); head finely and densely punctate, surface between punctures with conspicuous microreticulation of small cells; eyes large, rounded, finely faceted; frontoclypeal suture prominent through entire length; clypeal margin relatively straight, extending

to level of anterolateral margins of frons (fig. 4); anterior margin of labrum entire; antenna clavate, club not abrupt (fig. 4), antennomere ratios: length I:II:III = 1.8:1.0:1.6, width VII:VIII:IX = 1.0:1.0:1.2. Pronotum broad (PNL/PNW = 0.43–0.48), laterally not strongly produced, anterolateral angle moderately rounded, posterolateral angle more angulate than anterolateral angle; punctation and surface microsculpture similar to that of head. Elytra broad, robust, laterally broadly rounded (SEL/ELW = 1.08–1.19); coarsely and densely punctate, punctures not in series, surface between punctures shiny and smooth; sutural stria about two-thirds length of elytron. Mesosternum slightly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.30–0.31), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately expanded and with large ventral field of spatulate setae; left mandible unmodified; metafemur slender, unmodified; metasternal fovea moderately large, transverse, linear, anterad of middle, with prominent series of fine, dense setae. Median lobe in lateral aspect long, slender, irregularly sinuate, with distinct prominence on dorsal surface at base of apical portion which is robust, slightly curved and apically pointed (fig. 38); in ventral aspect very slender, lateral margins subparallel, apically prominently divided into two robust, apically pointed rami, apical orifice elongate (fig. 37); operculum absent (fig. 37); lateral lobes broad, broadly fused along dorsal and ventral margins forming a sheath around median lobe, apical portions broad, tapered to rounded apices, ending far short of apex of median lobe, without apical setae (figs. 37, 38).

Female tarsi 5-4-4.

DISTRIBUTION: This species is known from Oregon and New Brunswick (fig. 43).

SPECIMENS EXAMINED: CANADA: *New Brunswick*: Fredrickton, 20 Mar 1961, RC Clark (1, Utah State).

UNITED STATES: *Oregon*: 5 MI NE Newberg, 2 Nov 1968, black light trap, Anderson and Goeden (1, Utah State).

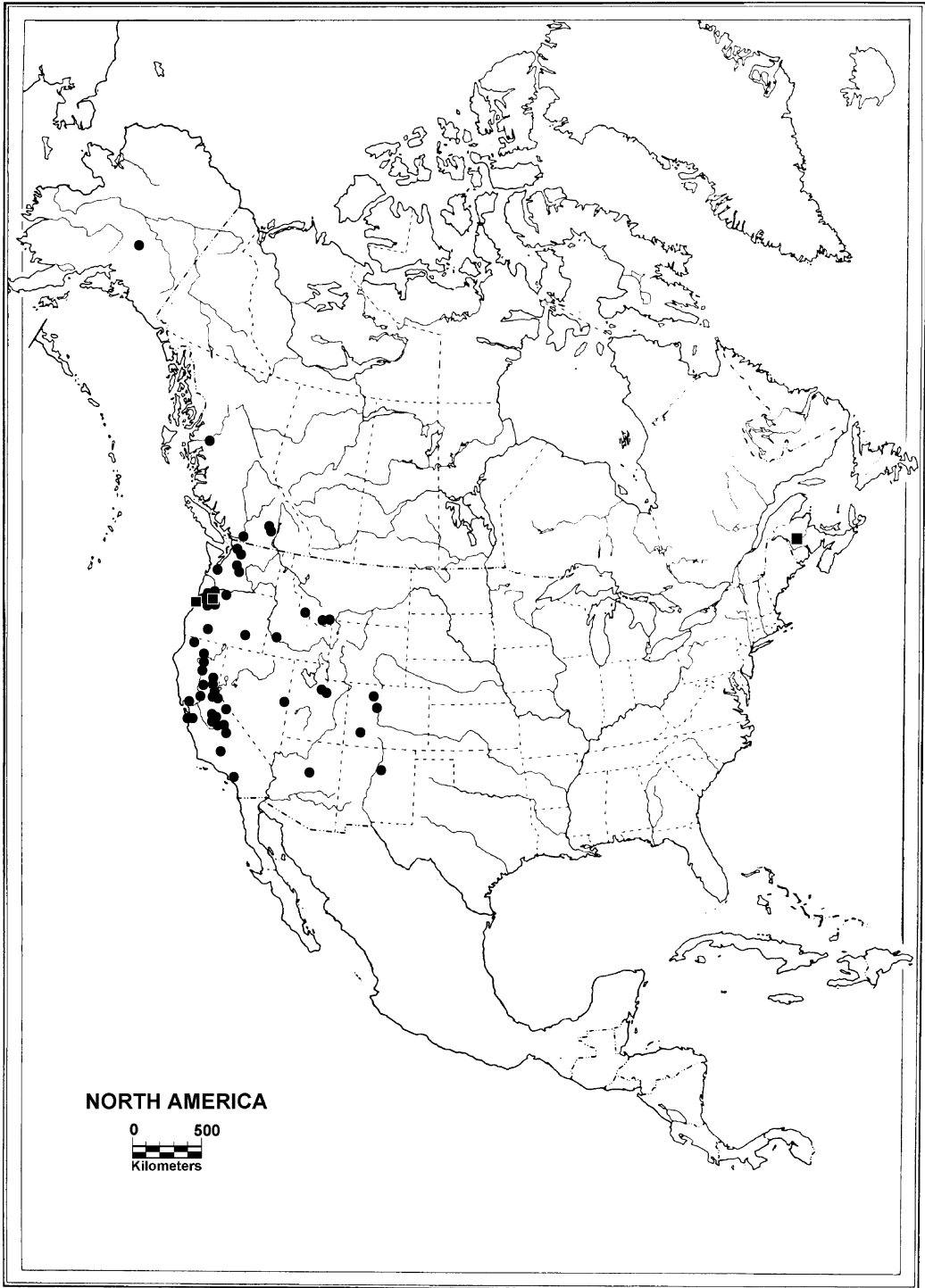


Fig. 43. Geographic distribution of *Agathidium concinnum*-group species: *A. concinnum* = ●; *A. hatchi* = ■.

DISCUSSION: This species was first described in *Anisotoma* but was transferred to *Agathidium* by Wheeler (1977). Hatch (1957) had already described a species of *Agathidium* named *fenderi*, and thus Wheeler replaced the transferred homonymous name with *A. hatchi*. Superficially the species does resemble many members of *Anisotoma* in being exceptionally large, broad, and dorsoventrally flattened. The unusual male genitalia are also reminiscent of some members of *Anisotoma* and are quite different from most other North American *Agathidium*. However, the prolonged temporum and supraocular carina (fig. 4), anteriorly shortened clypeus (fig. 4), and lack of serial striae on the elytra together suggest the species best belongs in *Agathidium* following Wheeler (1977). The antennae are unusual in that antennomeres 5–8 are gradually broadened such that the antenna does not have an abrupt 3-segmented club (fig. 4). In other respects, the species seems to resemble *A. concinnum* in general shape, relatively shallow concavity of the posterior portion of the mesosternum, and prolonged and protruding temporum.

The distribution of this species is unusual in that specimens are known from Oregon and New Brunswick, but from nowhere in between. The Oregon specimens (including the type) are females and the New Brunswick specimen is a male. Therefore, there is some possibility the specimens represent different species and that our male-female association is incorrect. However, since the specimens agree closely in all characters examined and numerous other species have transcontinental distributions, we regard conspecificity of the specimens to be a reasonable hypothesis until additional material can be discovered. It is also possible that the New Brunswick specimen is mislabeled. The species has been collected in March and November. One specimen was collected in a black light trap.

Agathidium concinnum Mannerheim
Figures 2, 5, 39, 40, 43, 118

Agathidium concinnum Mannerheim, 1852: 370; Horn, 1880; Leng, 1020; Fall, 1934b; Hatch, 1957.

Agathidium castaneum: Attributed to “Ménétriés in litteris” by Mannerheim (1852). (Published in synonymy with *A. concinnum* and never

made available by subsequent use as a valid name.) NOMEN NUDUM.

Agathidium effluens Mannerheim, 1853: 202; Horn, 1880 (synonymized with *A. concinnum*); Leng, 1920.

TYPE MATERIAL: *Agathidium concinnum*: lectotype (designated here to clarify assignment of this name to this species), ♀ in MCZC labeled “46/Type 7944 [number handwritten, red label]/*A. concinnum* Sitkha Mannh. [handwritten]”. Mannerheim had multiple individuals of this species, but was not clear how many. We have selected the female in MCZC labeled as the type as the lectotype.

Agathidium effluens: lectotype (designated here to clarify assignment of this name to this species), ♀ in MCZC labeled “Kenai [handwritten]/*A. effluens* RA. Mann [handwritten]/*concinnum*8 [handwritten]”. Mannerheim was not clear whether multiple specimens were involved during this description, so we have selected a single specimen from the MCZC as the lectotype.

TYPE LOCALITY: *Agathidium concinnum*: United States, Alaska. *Agathidium effluens*: United States, Alaska, Kenai Peninsula.

DIAGNOSIS: This species is characterized by the laterally protruding temporum in a bulge beyond the lateral margin of the eye (figs. 2, 5), the broad, depressed body form, the metafemur with a small, medial tooth on the posterior margin in most male specimens (fig. 118), and the median lobe of the aedeagus in lateral aspect very robust, with broad basal portion and subbasal constriction, apically tapered to a sharp, curved point (fig. 40) and in ventral aspect broad, with the apical portion broadly triangular and sharply pointed (fig. 39). The apical orifice is large with prominent, truncate rami visible (fig. 39).

DESCRIPTION: Body large (TBL = 2.51–3.30 mm), broad (PNW/TBL = 0.48–0.49), laterally broadly rounded, moderately contractile.

Head pronotum and elytron light brown to dark red-brown; venter light brown, darker on metasternum; antennae brown, club dark brown; palpi and legs brown.

Head broad (figs. 2, 5) (MDL/OHW = 0.60–0.67), flattened, without transverse, medial crease; temporum very prominent,

about one-half length of eye when viewed in dorsal aspect, extending prominently lateral to eye (figs. 2, 5); head finely and moderately densely punctate, smooth and shiny on surface between punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin curved, extending slightly beyond anterolateral margins of frons (figs. 2, 5); anterior margin of labrum entire; antennomere ratios: length I:II:III = 2.4:1.0:2.1, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum broad (PNL/PNW = 0.49–0.50), not strongly produced laterally, anterolateral angle subquadrate, posterolateral angle moderately angulate; punctation and surface microsculpture similar to those of head. Elytra broad, laterally broadly rounded (SEL/ELW = 1.02–1.11); coarsely and densely punctate, punctures not in series, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum moderately and broadly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum relatively broad medially (MTL/MTW = 0.24–0.29), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; left mandible unmodified; metafemur slender, many specimens with distinct, medial, small tooth (fig. 118); metasternal fovea minute, medial with small brush of fine, dense setae. Median lobe in lateral aspect very robust, very broad basally with prominent subbasal constriction, medially curved and expanded, apically tapered to sharply pointed, slightly dorsally directed apex (fig. 40); in ventral aspect broad, apical portion very broadly triangular, tapered to slightly acuminate, pointed apex, orifice extremely large (fig. 39); operculum comprised of two long, broad, flat structures, each ramus apically rounded to subtruncate (fig. 39); lateral lobes moderately broad basally, more slender submedially, apically expanded and directed ventrad, apices slightly constricted and pointed with 2 prominent setae (figs. 39, 40).

Female tarsi 5-4-4.

DISTRIBUTION: This species is widespread in western North America from Alaska south to Arizona and east to Colorado and New Mexico (fig. 43).

SPECIMENS EXAMINED: "W.T." [probably Washington Territory] (1, MCZC).

CANADA: *British Columbia:* NEAR Mabel Lake at Squaw Valley, 11 Aug 1982, R Baranowski (2, LUND); Mesachie, 30 Jun 1980, H and A Howden (8, CNCI); Stanley, 21 Jun 1932, W Mathers (1, CASC); Pender harbor, 20 Jun 1929, RT Turner (1, CASC); Lorna, 29 Jul 1926, H Richmond (4, CASC); Merrit, 22 Aug 1925, *Pinus ponderosa*, WM Mathers (1, MCZC); Lorna, 28 Jul 1926, *Picea engelmanni*, H Richmond (1, MCZC); Lorna, 20 Jul 1924, R Hopping (2, MCZC); Lorna, 23 Jul 1924, R Hopping (2, MCZC); Lorna, 28 Jul 1926, *Picea engelmanni*, B Hopping (1, CASC); Monashee Mtn Near Cherryville, 11 Aug 1982, 1600 m, M Sorensson (4, LUND); Stanley (1, CASC); Terrace, ME Hippisley (1, MCZC); Terrace (1, MCZC); Terrace, Feb 1960, ME Clark (1, MCZC); Terrace, ME Clark (1, MCZC); near Mabel Lake at Squaw Valley, 5 Aug 1982, R Baranowski (2, LUND); Monashee Mtn Near Cherryville, 10 Aug 1982, 1400–1600 m, M Sorenson (3, LUND); Manning Park, E gate, 24 Jul 1984, lodgepole pine, D Miller (1, CNCI); Manning Prov. Park, 27 Nov 1992, 1220 m, spruce or fir log, red or brown rotten wood, R Baranowski (1, LUND).

UNITED STATES: *Alaska:* E Fork Toklat River, McKinley Park, 17 Aug 1958, Lindroth (1, MCZC). *Arizona:* state only (5, MCZC); White Mts, 4 Jul 1933 (2, CASC); Flagstaff, San Francisco Mts, 13 Aug 1934, 8000', D Rockefeller (2, AMNH). *California:* state only (14, MCZC); Miami, Jun (1, MCZC); Sta Cruz Mts (1, CASC); Tehachapi, Wickham (1, MCZC); colr. (2, MCZC); Stanford Univ, 4 Apr 1955, PS Bartholomew (2, CASC); Tahoe Canyon, 27 Jun, A Fenyes (2, MCZC); Miami, Jun (1, CASC); Pomona, 30 May 1896 (1, MCZC); Yosemite, 20 May 1934, Bryant (1, CASC); McClaw, A Fenyes (1, CMNH); Los Gatos (1, MCZC); Tehachapi, Wickham (1, MCZC); North Fork, 31 May 1920, Dietrich (2, MCZC); Tahoe Canyon, Jun (1, CASC); Manzanita Lake, Lassen Natl Park, 23 May 1941, CD Michener (1, EMEC); Wawona, Jun (1, CASC); Sugar Pine, 6 Jul (1, CASC); Miami, Jun (1, CASC); Alpine Co.: 4 mi W Markleville, 30 Sep 1970, grass duff, Berlese, FG Andrews (1, FGAC); Butte Co.: 5 mi NE Butte Mdw Cherry Hill Cpgd, 7 May 1976, caught flying, FG Andrews (2, FGAC); El Dorado Co.: 0.7 mi E Pacific House, 28 Apr 1992, screening flume, F Andrews, T Eichlin (1, FGAC); 7 mi S Yellow-

- jacket Camp, 28 Jun 1980, CY Kitayama (4, EMEC); China Flat CG, 2 mi S Kyburz, 21 Jun 1979, 4300', W and AR Hardy (1, FGAC); 5 mi S Meyers, 29 Jun 1975, 7200', mixed conifer forest, litter, Berlese, A. Newton, M. Thayer (1, MCZC); Fresno Co.: 5 mi SW Big Creek, 9 Jul 1962, JF Lawrence (2, MCZC); Kern Co.: 2 mi W Woffard Hts, 29 Apr 1964, Doyen (1, EMEC); Mariposa Co.: Fish Camp, 6 mi NW, 8 Jul 1962, JF Lawrence (1, EMEC); 2 mi NE Darrah, 17 Nov 1975, oak litter, Berlese, AJ Gilbert (1, FGAC); Mono Co.: Convict Lake (near Mammoth Lakes), 13 Jun 1984, 8000', R Baranowski (1, LUND); Inyo Hat For. HM Hall Nat Area, 28 Aug 1973, 10,000–10,400', *Pinus murrayana* forest, pitfall trap, R Papp (3, EMEC); Nevada Co.: Sagehen Creek, 28 Aug 1983, debris, log in stream, F Andrews, A Hardy (1, FGAC); Placer Co.: Carnelian Bay, Lake Tahoe, 24 Jun 1964, DF Veirs (1, EMEC); Plumas Co.: Lake Almanor, 23 Apr 1971, pine litter, FG Andrews (1, FGAC); San Bernardino Co.: Hardin Flats, 13 Jun 1964, R Scott (1, FGAC); Santa Clara Co.: colr. (1, MCZC); Santa Cruz Co.: county only (1, MCZC); Boulder Creek, 7 May 1968, A and A Gillogly (1, FGAC); Shasta Co.: Burney Falls, 18 Jun 1954, RO Schuster (2, FGAC); Sierra Co.: Yuba Pass, 8 Jul 1976, moss along small stream, FG Andrews (1, FGAC); 10 mi E Sierra City, N Yuba River, 28 Jun 1976, 6200', L and N Herman (1, AMNH); Siskiyou Co.: county only (1, CASC); 3 mi E McCloud, Elk Creek, 30 Jun 1976, 3200', L and N Herman (1, AMNH); 5.4 mi SE Seiad Valley, O'Neil Creek, 3 Jul 1976, 1500–2000', L and N Herman (1, AMNH); Tehama Co.: Snoqualmie Gulch 10 mi SE Manton, 1 Dec 1986, 2850', leaf litter, DS Chandler (1, CNCI); Toulumne Co.: 10 mi E Buck Meadows, 16 Jun 1984, 3500', R Baranowski (1, LUND); Tulare Co.: Sequoia Natl Park., 10 May 1979, R Baranowski (1, LUND); Sequoia Natl Park, Halstead Creek, 23 May 1984, R Baranowski (13, LUND); Ash Mountain, 17 Mar 1984, flume forebay, R Haines (1, FGAC); Tuolumne Co.: 30.5 NE Strawberry near Deadman Creek, 18 Jul 1976, 8000', L and N Herman (3, AMNH). *Colorado*: Breckenridge, 15 Jul 1896, 9600–10,000', Wickham (1, MCZC); above Ouray, mineral point trail, 1 Jul 1889, 9000–10,000', Wickham (1, MCZC); Veta Pass, Jun 1924 (1, MCZC); Grand Co.: SE Rabbit Ears Pass, 21 Jun 1975, 9000', squirrel middens under conifers, A. Newton, M. Thayer (2, MCZC). *Idaho*: Boise Co.: N Centerville, 14 Sep 1974, AD Allen (1, PECK); Lemhi Co.: continental divide 2.4 mi airline SW of Bannock Pass, 24 Aug 1962, 8500', HB Leech (2, CASC); continental divide 2.4 mi airline SW Bannock pass, 24 Aug 1969, HB Leech (16, CASC). *Montana*: Gallatin Co.: Earthquake Lake, 28 Jun 1966, J Haddock (1, EMEC); Madison Co.: Hidden Lake Bench, Oct–May 1989, 7400', FIT, DL Gustafson (1, MTEC). *Nevada*: state only (13, MCZC); White Pine Co.: Snake Range, 6 mi W Baker, 1984–1985, pitfall trap, D Giuliani (3, FGAC). *New Mexico*: San Miguel Co.: Gallinas, 6 Aug 1992, JF Cornell (2, CUIIC). *Oregon*: state only (3, MCZC); Albany (1, MCZC); Portland, 22 Jun (3, OSUC); Corvallis, 12 Jun 1925, EP VanDyke (1, CASC); Clarks, 10 Jan 1961, H Foster (1, RLWE); nr Plains, 1 Apr 1956, fir slab wood, K Goeden (5, RLWE); Benton Co.: nr Corvallis, Mary's Pass, May 1966, rotary net trap (3, CUIIC); Corvallis, 23 Jun 1974, from nest of *Neotoma fuscipes*, D Carlson (2, FGAC); Clakamas Co.: Salmon River nr Zigzag, 27 Aug 1982, R Baranowski (3, LUND); Harney Co.: Steens Mt N side Loop Rd, 12 May 1972, aspen-juniper duff, E Benedict (1, CNCI); Steens Mt, Fish Lake Rd, 19 Jul 1971, 6000', juniper-aspen duff, HE Benedict (1, PECK); 15 mi E Frenchglen Lily Lake, 29 Jul 1971, aspen duff, E Benedict (6, CNCI); Klamath Co.: Kimball St. Park. Wood River Spring, 2 mi N Fort Klamath, 20 Jun 1978, J Schuh, L and N Herman (1, QDWC); PoLake Co.: 0.5 mi S Buell, 9 Jan 1981, *Neotoma* nest 15' off ground, PJ Johnson (1, FMNH); 1 mi N Suver Jct, old Hwy 99-W, 23 Mar 1980, fecal material, nest of *Neotoma* sp., PJ Johnson, J LaBonte (2, FMNH); Buell, 27 Sep 1981, fecal chamber of *Neotoma fuscipes*, PJ Johnson (2, FMNH); 3 mi S Airlie, 23 Mar 1980, *Neotoma* nest, PJ Johnson (2, FMNH); Yamhill Co.: Muddy Valley, 2 Feb 1982, *Neotoma* nest, fence post, PJ Johnson (1, FMNH). *Utah*: Uintah Mts, Tryol Lake, 26 Aug 1920, 9800', HP Chandler (1, CASC); Alta (2, MCZC); Wasatch Co.: Lost Lake Camp, Uinta Mountains, 29 Aug 1940, 7800', HP Chandler (2, CASC). *Washington*: Easton (1, CASC); Baring, Jul (1, CASC); Olympia (1, MCZC); King Co.: 14 km S North Bend, 4 Mar 1981, moss on rocks, RE Nelson (1, CNCI); Skagit Co.: 2 mi NW Rainy Pass, 31 Jul 1982, M Sorensson (2, LUND); 2 mi NW Rainy Pass, 31 Jul 1982, R Baranowski (1, LUND); Birdsvew, 27 Jul 1982, R Baranowski (1, LUND).

DISCUSSION: Based on our examination of the type specimens of *A. concinnum* and *A. effluens*, these two names refer to the same species following Horn (1880).

This species has been collected from every month during the year. Specimens have been collected in a variety of habitats including pine, juniper, and aspen forests and various sources of litter. The most intriguing habitat,

which has yielded numerous specimens, is the nests of *Neotoma* sp. and *Neotoma fus-cipes*. Elevation records are from 2850 ft (California) to 10,400 ft (California).

AGATHIDIUM PULCHRUM SPECIES GROUP

DIAGNOSIS: Members of this species group are characterized by having the mesosternum strongly concave (declivitous), the clypeus strongly excavate to extending moderately beyond the sides of front of cranium (e.g., figs. 6, 22), the metasternum not strongly shortened, the humeral angles of the elytra relatively distinct, the postocular tempora relatively short (e.g., figs. 6, 22), and males of several species with a prominent tusk or horn on the left mandible (e.g., figs. 21–29, 44, 45). Several of the species are distinctly and dramatically maculate dorsally (figs. 44–46, 48–51), which is unusual for New World members of *Agathidium*. The tarsal formula is ♂ 5-5-4 / ♀ 5-4-4 or 4-4-4.

DESCRIPTION: This group includes species belonging to the subgenus *A. (Neocele)* *Gozis auctorum*, a very diverse Holarctic group. The presence of a horn on the male left mandible (also occurring in our *A. brev-isternum* and some of our *A. concinnum* group species) is a particularly unique feature of several of these species in the Leiodidae and in beetles in general. Asymmetry in similar secondary sexual features is only rarely reported. The horn comes in a variety of shapes and sizes when fully developed, including those that are short, spinous, and adpressed (figs. 29, 30) to very long and variously curved (figs. 21–23, 44, 45). One species, *A. aristerium*, has the apex of the mandible strongly upturned and truncate apically (fig. 25, 26). In several species the mandibular horn bears a prominent brush of setae arising apically from an oblique, curved impressed line, but not all species have a setose horn. In all species where sufficient material is available for examination, the horn is variable from entirely absent to well developed. In some species, very many males are strongly modified, whereas in some very few males are modified. The development of this dimorphism is particularly dramatic in one species, *A. marae*, in which not only is there a

left mandibular horn, but the right surface of the frons is also developed into an opposing spine (figs. 23, 24). No evidence has yet been presented for a function for the mandibular horn, but other beetles with horns use them for male-male competition, a possible scenario for these species where large numbers of males and females are often concentrated on a small food and oviposition resource where competition for mates might figure strongly. Historically, many species were recognized based on the presence or absence of a male mandibular horn, but the variability of this feature within all species that possess it makes this an unreliable character for keying or diagnosing species. In the past, species identifications have also relied heavily on the number of female protarsomeres (5 or 4). Although this is a good diagnostic feature of some species, we have avoided using this character as an exclusive diagnostic character since it is not always possible to positively associate males with females. It seems apparent from previous work on the group that often female and males were misassociated, leading to erroneous conclusions about the tarsal formula for females of certain species.

Most of these species occur in forests of western and northern North America. There is an additional assemblage of species in northeastern North America and a few that occur only in the central portion of the continent.

KEY TO *A. PULCHRUM* SPECIES GROUP

1. Elytra maculate, either irregularly brown and yellow or red with a broad, black triangle at bases of elytra (figs. 48–51); female with five protarsomeres 2
- Elytra concolorous brown to piceous; female with four or five protarsomeres 5
- 2(1). Elytra red with a broad, black triangle medially at base of elytra and black around elytral margins (fig. 48); mesosternum with distinctive lobe extending ventrad between mesocoxae; lateral lobes apically prominently expanded (fig. 53); median lobe of aedeagus without medial excavation on ventral surface visible in lateral aspect (fig. 53)
 *A. difforme* (LeConte)
- Elytra yellow with irregular black maculae (figs. 49–51); mesosternum without dis-

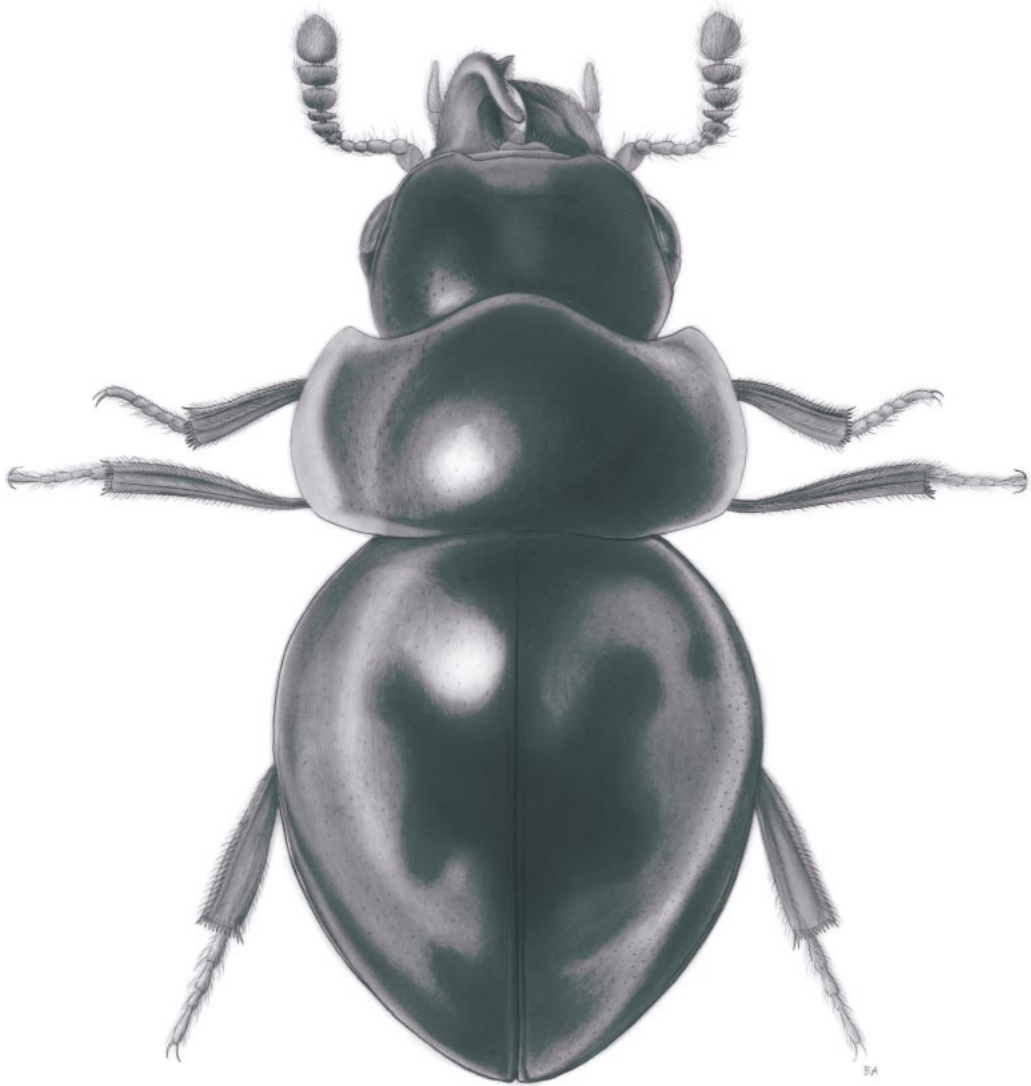


Fig. 44. *Agathidium pulchrum*, dorsal habitus.

tinctive posteroventral lobe; lateral lobes apically not prominently expanded; median lobe of aedeagus with distinctive medial excavation on ventral surface visible in lateral aspect 3
 3(2). Elytron without sutural stria (fig. 49); anterior clypeal margin near level of anterolateral margins of frons (fig. 49); male left mandibular horn, when fully formed, relatively straight and flattened; operculum apically narrowed to two spinous apices (fig. 54) *A. maculosum* Brown
 — Elytron with distinct sutural stria; anterior

clypeal margin strongly excavate, not extending to level of anterolateral margins of frons (figs. 22, 51); male left mandibular horn, when fully formed, relatively curved and rounded (e.g., figs. 21, 22); operculum reduced to inconspicuous, flattened hyaline lobe (figs. 56, 58) 4
 4(3). Elytral maculation usually more extensive, covering much of elytra (fig. 51); median lobe of aedeagus in lateral aspect with apical portion slender, apically narrowly rounded or pointed (fig. 57), in ventral aspect with apical portion broader, lateral

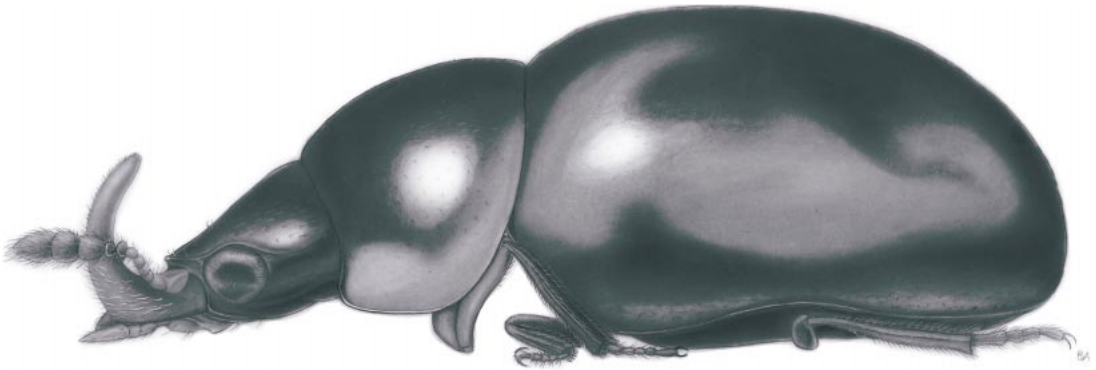


Fig. 45. *Agathidium pulchrum*, lateral habitus.

- margins more abruptly convergent apically (fig. 56) *A. pulchrum* LeConte
- Elytral maculation usually less extensive, most of elytron yellow (fig. 50); median lobe of aedeagus in lateral aspect with apical portion more robust, apically more broadly rounded (fig. 59), in ventral aspect with apical portion slender, lateral margins evenly convergent to apex (fig. 58) *A. amae*, new species
- 5(1). Anterior clypeal margin broadly convex, extending distinctly beyond anterolateral margins of frons (figs. 6–8); male without left mandibular horn 6
- Anterior clypeal margin straight, not extending beyond anterolateral margins of frons though in some species at level of frons, generally excavate (e.g., figs. 9–15); male with or without left mandibular horn 8
- 6(5). Mesosternum with prominent, flattened lobe extending ventrally between mesocoxae; median lobe of aedeagus in ventral aspect relatively slender basally and broadly expanded apically, apex short and broadly rounded (fig. 60), operculum broad and laterally rounded, apically broadly rounded and with deep, narrow medial emargination (fig. 60); southern California (fig. 89) *A. laetum* Fall
- Mesosternum without ventrally directed lobe between mesocoxae; median lobe of aedeagus in ventral aspect not apically broadly expanded, with apex long, slender, and sharply pointed (figs. 62, 64); operculum longer and more slender, apically either not emarginate or with emargination shallower and broader (figs. 62, 64); Alaska south to British Columbia and Alberta east to New Hampshire 7
- 7(6). Median lobe of aedeagus in lateral aspect with apex very sharply curved dorsad (fig. 63); operculum apically expanded and medially distinctly emarginate (fig. 62) *A. athabascanum* Fall
- Median lobe of aedeagus in lateral aspect with apex directed slightly dorsad, but straight, not strongly curved (fig. 65); operculum apically truncate, not medially emarginate (fig. 64) *A. columbianum* Fall
- 8(5). Surfaces of head and pronotum with fine but distinctive microreticulation consisting of fine lines forming small, isodiametric cells 9
- Surfaces of head and pronotum without microreticulation, surface smooth and shiny between punctures 10
- 9(8). Antennomere VII large, twice as long as and distinctly wider than VIII (fig. 16); male metasternal fovea large, transverse, located anterad of middle; median lobe of aedeagus slender, relatively straight in lateral aspect, with relatively small basal portion, apex sharply pointed and distinctly curved dorsad (fig. 67) *A. rusticum* Fall
- Antennomere VII smaller, similar in width and length to VIII; male metasternal fovea rounded, smaller, located slightly posterad of middle; median lobe of aedeagus relatively strongly curved basally, with large basal portion, apex sharply pointed, but relatively long and straight (fig. 69) *A. repentinum* Horn
- 10(8). Margin immediately posterad of eye produced laterally into a prominent pointed



F/LF

Fig. 46. *Agathidium maculosum*, dorsal habitus.

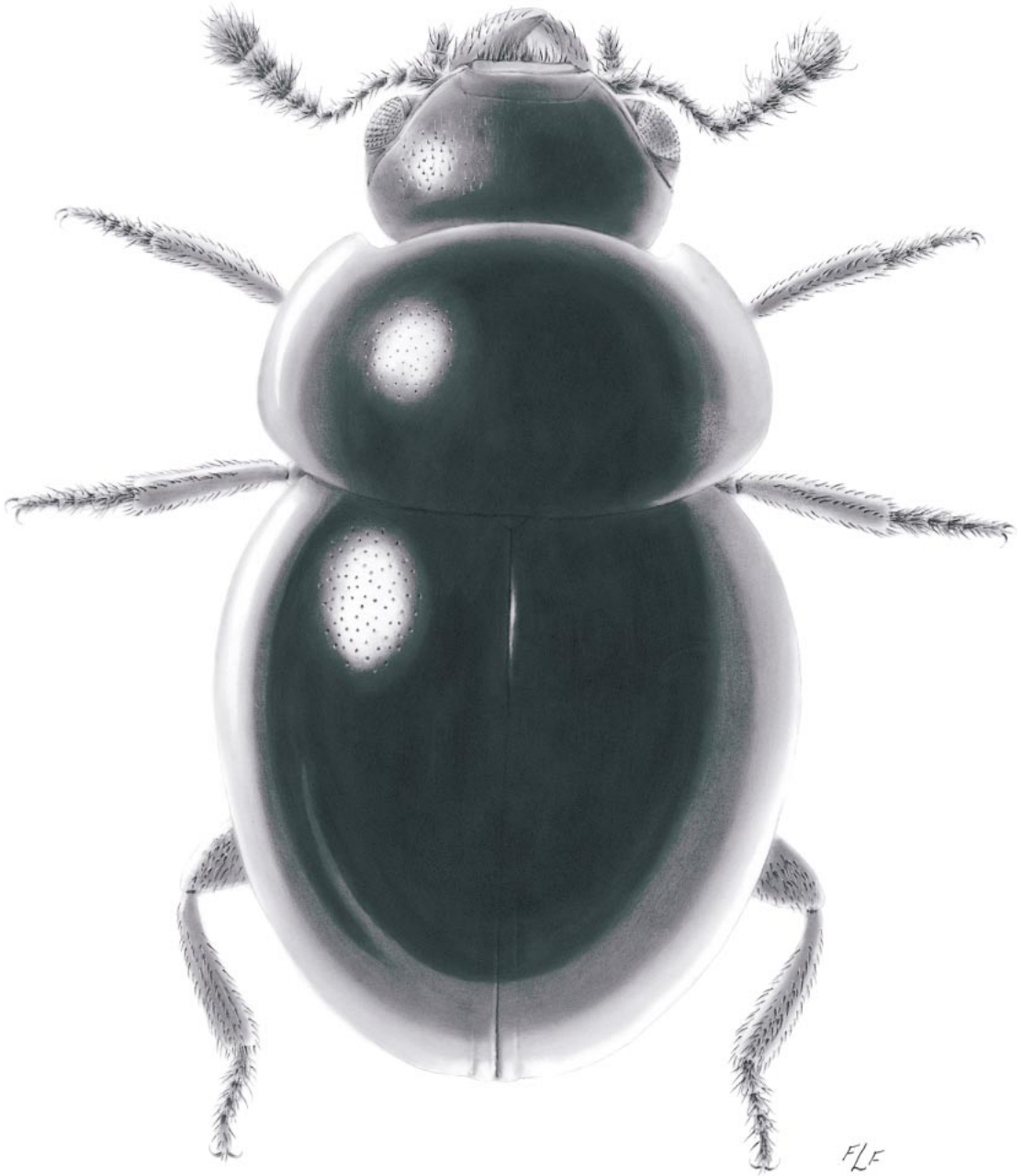
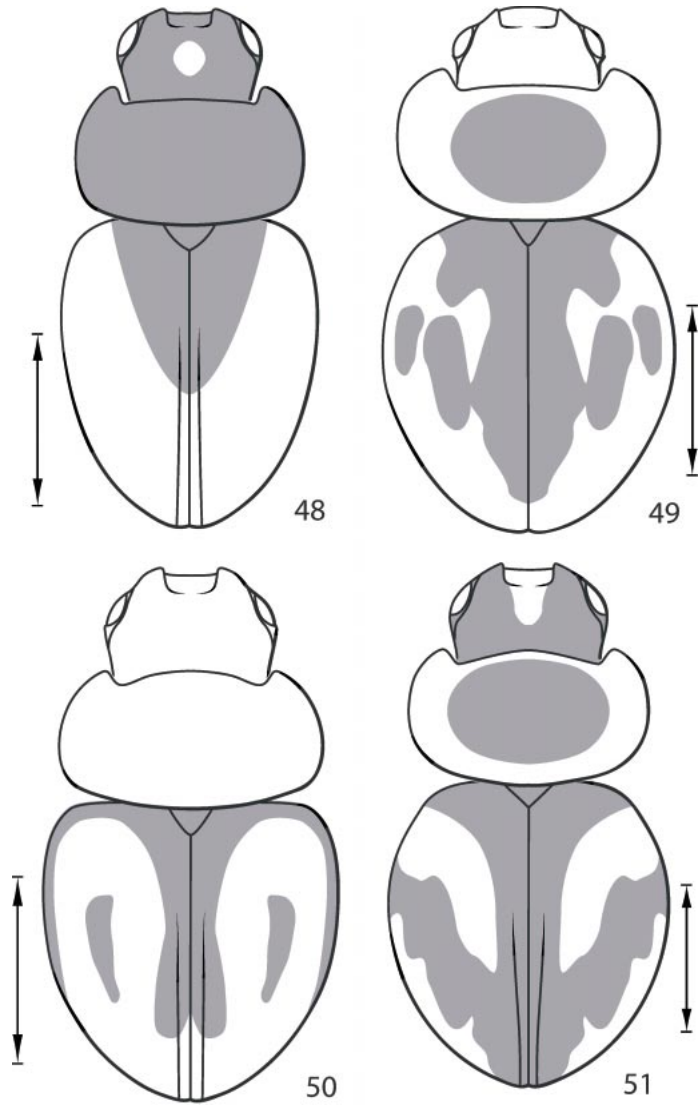


Fig. 47. *Agathidium repentinum*, dorsal habitus.

rim when viewed dorsally (fig. 24); male often with prominent, strongly setose, broad horn extending from dorsal surface of left mandible upwards and to right in curve over clypeus, some males also with well-developed horn arising

from surface of frons to right of clypeus (figs. 23, 24), if this horn not fully developed, then often with at least a distinct swelling at this location when compared with left side of frons; median lobe of aedeagus long and slender in lat-



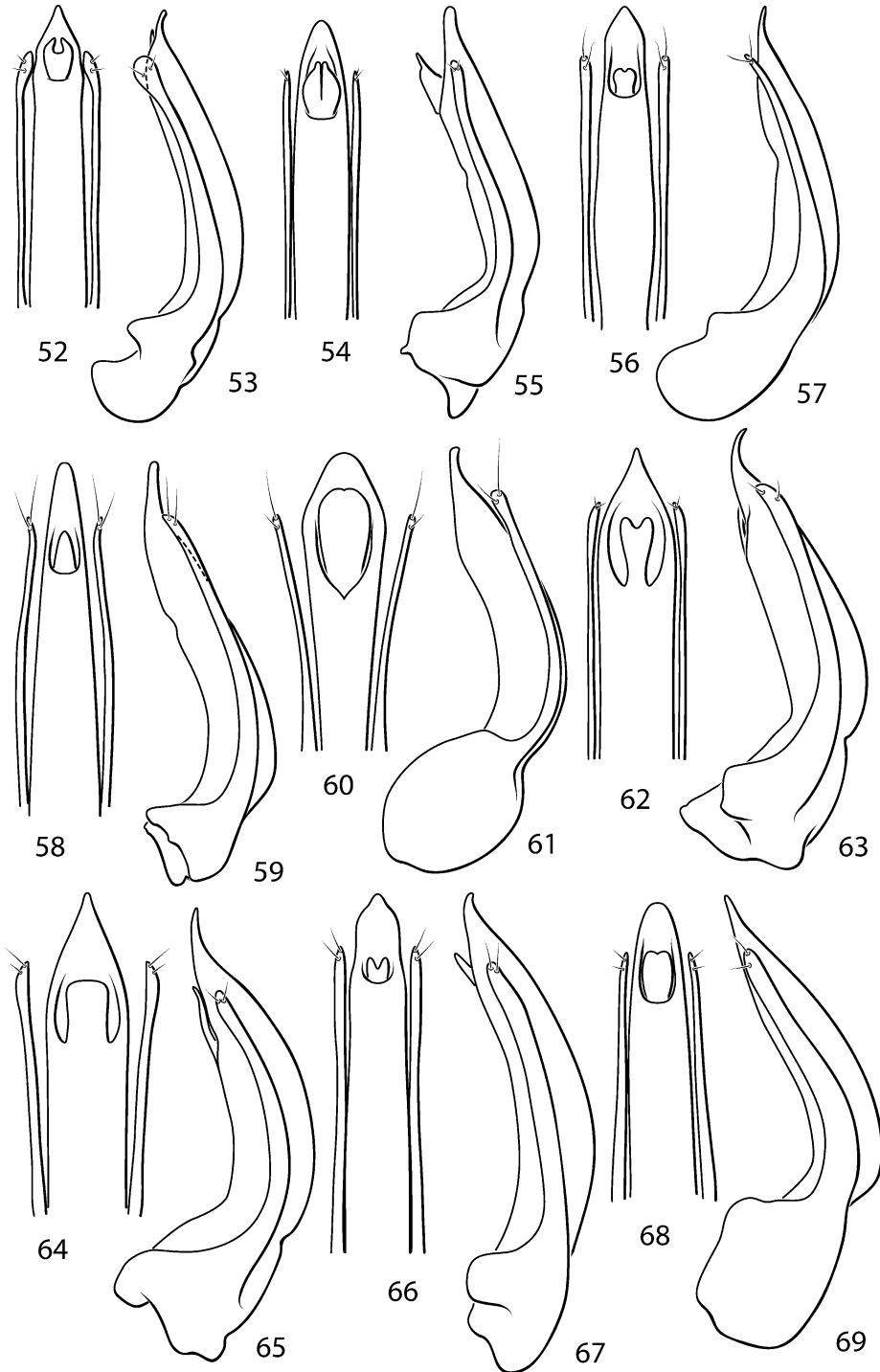
Figs. 48–51. *Agathidium pulchrum*-group species, dorsal habitus: **48**, *A. difforme*. **49**, *A. maculosum*. **50**, *A. amae*. **51**, *A. pulchrum*. Bars = 1.0 mm.

eral aspect, with small basal portion and with apex pointed and curved dorsad (fig. 71); lateral lobes broadly fused dorsally for about 1/3 length of median lobe of aedeagus (figs. 70, 71)

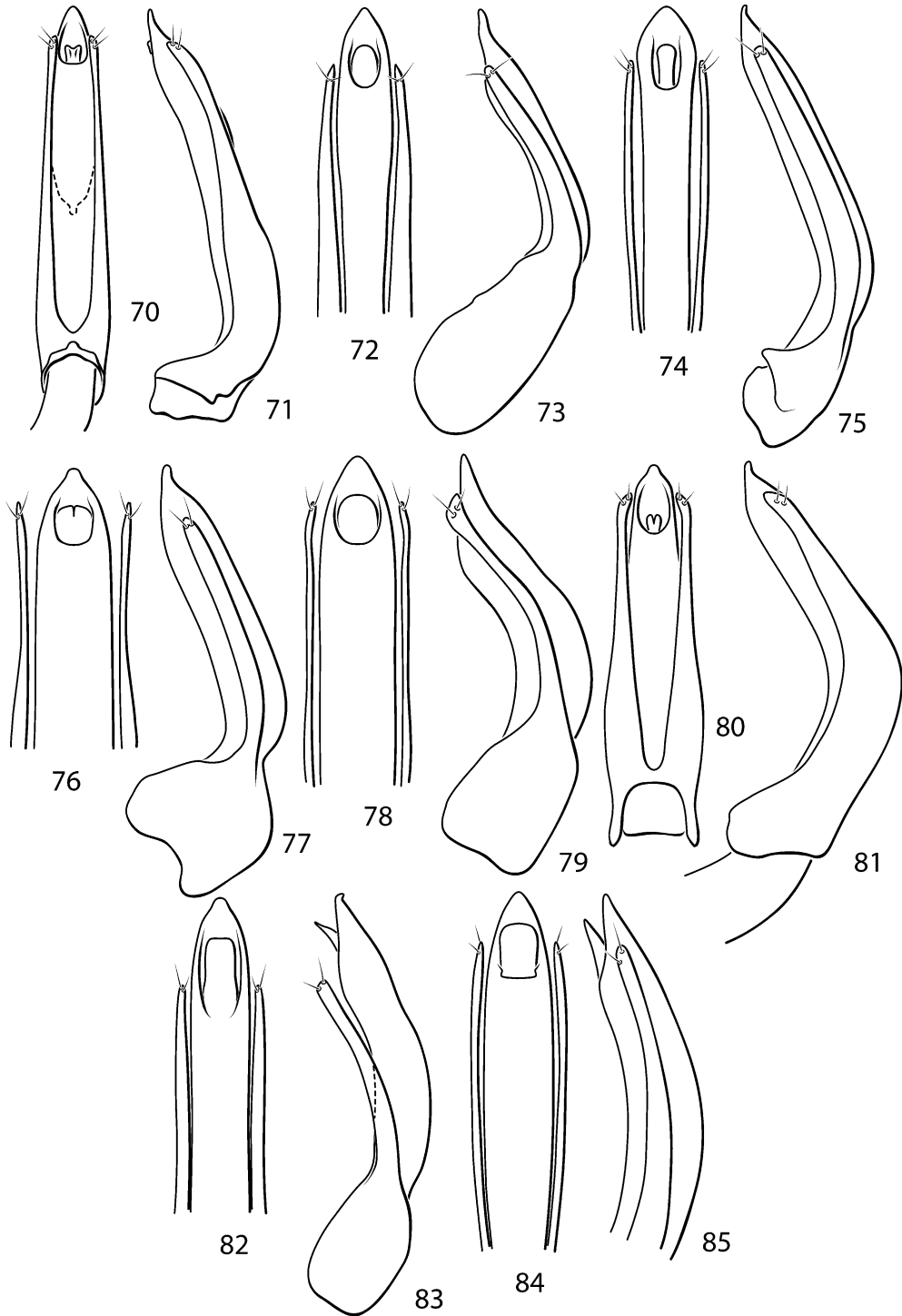
. *A. marae*, new species

- Margin immediately posterad of eye not or only slightly produced laterally; not generally forming a rim, usually evenly curved from eye along temporum; male often horned on left mandible, but without frontal horn or prominence; median lobe of aedeagus various; lateral lobes

- not fused dorsally for one-third length of median lobe of aedeagus 11
- 11(10). Size small (TBL < 2.2 mm) ; anterior clypeal margin extending to level of posterolateral margins of frons (fig. 11); antennomere II subequal in length to antennomere III; male metasternal fovea absent; male left mandibular horn absent; female tarsi 4-4-4; median lobe of aedeagus in lateral aspect with large basal portion, apical portion moderately long, straight and apically slightly expanded and rounded (fig.



Figs. 52–69. *Agathidium pulchrum*-group species, aedeagus: 52, 53, *A. difforme*: 52, ventral; 53, lateral. 54, 55, *A. maculosum*: 54, ventral; 55, lateral. 56, 57, *A. pulchrum*: 56, ventral; 57, lateral. 58, 59, *A. amae*: 58, ventral; 59, lateral. 60, 61, *A. laetum*: 60, ventral; 61, lateral. 62, 63, *A. athabascanum*: 62, ventral; 63, lateral. 64, 65, *A. columbianum*: 64, ventral; 65, lateral. 66, 67, *A. rusticum*: 66, ventral; 67, lateral. 68, 69, *A. repentinum*: 68, ventral; 69, lateral.



Figs. 70–85. *Agathidium pulchrum*-group species, aedeagus: 70, 71, *A. marae*: **70**, ventral; **71**, lateral. 72, 73, *A. rotundulum*: **72**, ventral; **73**, lateral. 74, 75, *A. aristerium*: **74**, ventral; **75**, lateral. 76, 77, *A. atronitens*: **76**, ventral; **77**, lateral. 78, 79, *A. oregonense*: **78**, ventral; **79**, lateral. 80, 81, *A. picipes*: **80**, ventral; **81**, lateral. 82, 83, *A. hamulum*: **82**, ventral; **83**, lateral. 84, 85, *A. politum*: **84**, ventral; **85**, lateral.

- 73); northern California north to Alaska (fig. 91)
- *A. rotundulum* Mannerheim
- Size larger (TBL > 2.2 mm) ; anterior clypeal margin distinctly excavated, though in some cases not strongly so; antennomere II distinctly longer than antennomere III, if II approaching length of III, then TBL clearly greater than 2.2 mm and anteriorly clypeal margin prominently excavated; male with metasternal fovea; male left mandibular horn present or absent; female tarsi 4-4-4 or 5-4-4; median lobe of aedeagus variable; distribution variable 12
- 12(11). Male metasternal fovea located at center of metasternum 13
- Male metasternal fovea located distinctly anterad of center of metasternum 14
- 13(12). Male mandibular horn, when present, formed by extension of apex of mandible in long, evenly curved, flattened structure (figs. 25, 26); median lobe of aedeagus in lateral aspect slender, with small basal portion, evenly and shallowly curved (fig. 75), in ventral aspect apically expanded and very broadly pointed (fig. 74)
- *A. aristerium* Wheeler
- Male mandibular horn, when present, straight, extending from middle of mandible in oblique angle to right over right mandible (figs. 27, 28); median lobe of aedeagus in lateral aspect robust, with large basal portion, strongly constricted and curved distad of expanded basal portion (fig. 77), in ventral aspect apically not or only slightly expanded and more strongly pointed (fig. 76) *A. atronitens* Fall
- 14(12). Male lateral lobe apically abruptly expanded and obliquely truncate (fig. 79); median lobe of aedeagus in lateral aspect robust, apex slender, straight and sharply pointed (fig. 79)
- *A. oregonense*, new species
- Male lateral lobe not expanded apically, of even width to near apex; median lobe of aedeagus in lateral aspect variable, but without long, slender, straight apex 15
- 15(14). Median lobe of aedeagus in lateral aspect slender, strongly bent medially, nearly in right angle (fig. 81); male mandibular horn, when present represented by a short, flattened spine extending pos-

- terad over clypeus (figs. 29, 30)
- *A. picipes* Fall
- Median lobe of aedeagus in lateral aspect moderately curved, but not strongly bent medially; male mandibular horn, when present, represented by a long, rounded, setose horn 16
- 16(15). Median lobe of aedeagus in lateral aspect apically with small, abrupt hook (fig. 83) *A. hamulum*, new species
- Median lobe of aedeagus in lateral aspect apically without hook (fig. 85)
- *A. politum* LeConte

Agathidium difforme (LeConte)
 Figures 48, 52, 53, 86

Phalacrus difformis LeConte, 1850: 222.
Agathidium difformis, LeConte, 1853: 286; Horn, 1880; Fall, 1934b.
Agathidium difforme, Leng, 1920.
Agathidium canadensis Brown, 1930: 89; Fall, 1934b (synonymized with *A. difforme*).

TYPE MATERIAL: *Agathidium difforme*: lectotype (designated here to clarify assignment of this name to this species), ♂ in MCZC labeled “[light green circular disk with two sides cut away]/Type 3175 [number handwritten, 2/3 of label red]/*A. difforme* Lec [handwritten]”. Since LeConte did not indicate how many specimens he had at the time of description, we have selected a male specimen in the MCZC to be the lectotype.

Agathidium canadense: holotype ♂, in CNCI labeled “Brittania Ont. VI-8-1928 W.J.Brown/♂/HOLOTYPE *Agathidium canadensis* 2878 No. Brown [red label]”. There are two female paratypes with the same collection information as the holotype.

TYPE LOCALITY: *Agathidium difforme*: North side of Lake Superior (LeConte, 1853).

Agathidium canadense: Canada, Ontario, Britannia.

DIAGNOSIS: This species is diagnosed by the unique dorsal color pattern. The elytra are red with a large, black basal triangle (fig. 48). The anterior clypeal margin is strongly excavate (fig. 48). The male mandibular horn, when fully formed, is long, stout, and curved, extending from the medial surface of the left mandible up and over the clypeus. The median lobe of the aedeagus is slender, relatively straight, and apically pointed (fig. 53). The lateral lobes are apically broadly ex-

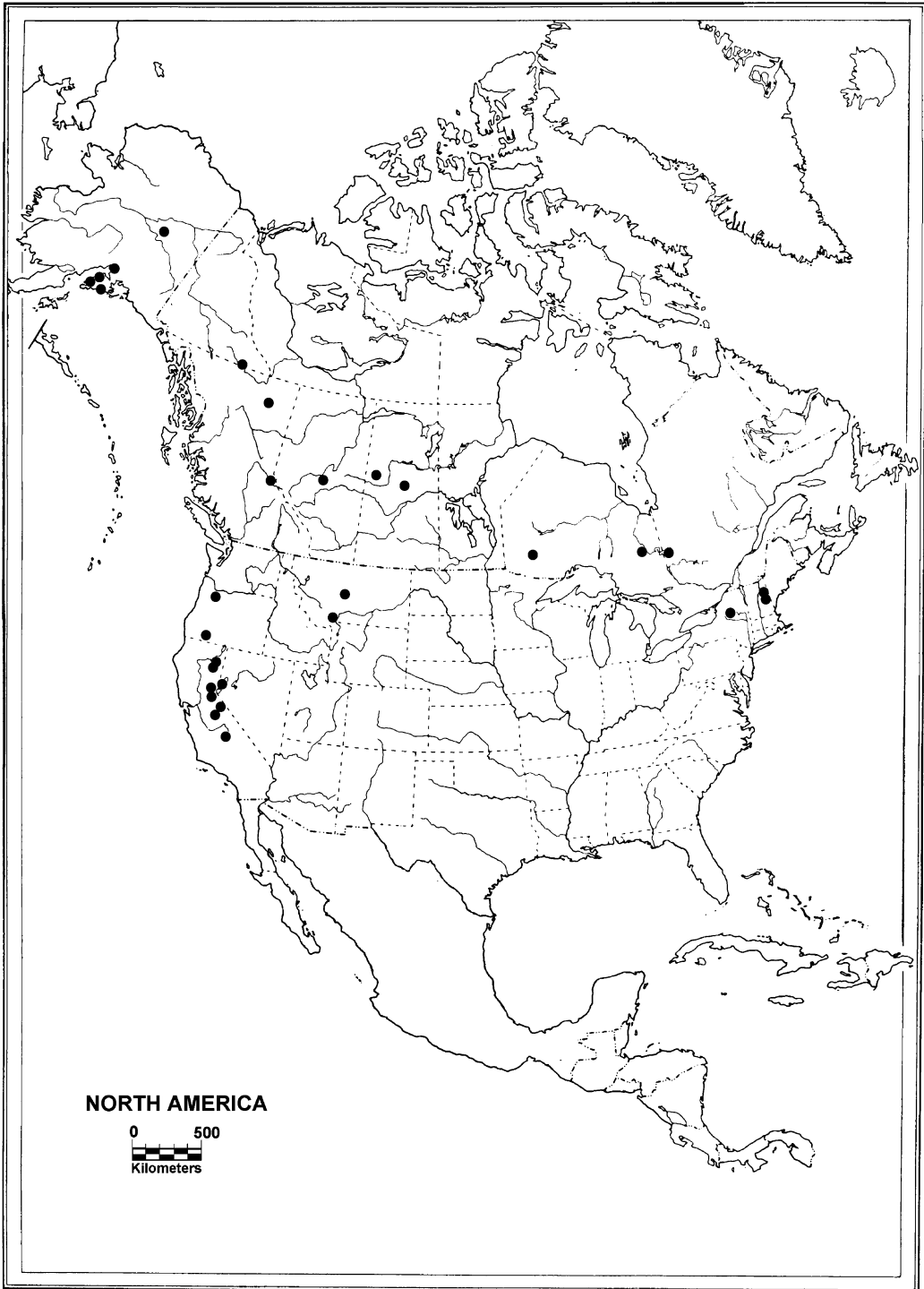


Fig. 86. Geographic distribution of *Agathidium difforme*.

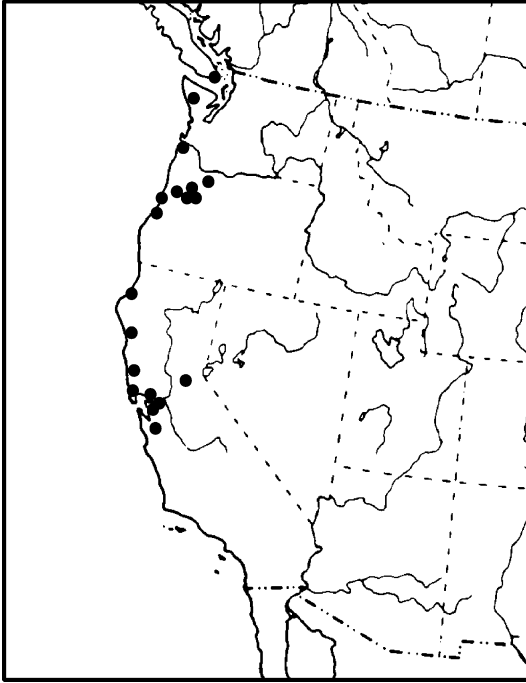


Fig. 87. Geographic distribution of *Agathidium maculosum*.

panded and broadly rounded (fig. 53). Females have 5-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 2.26–3.88 mm), somewhat elongate (PNW/TBL = 0.46–0.47), moderately contractile.

Head piceous with medial red macula, clypeus red; pronotum yellow laterally with large region of red to piceous medially; elytron red medially with black broadly around lateral margins and with large, black triangular macula anteriorly along suture; venter piceous; antennae dark red, club dark brown; palpi and legs dark red.

Head broad (fig. 48) (MDL/OHW = 0.52–0.53), flattened, often with moderately prominent transverse, medial crease; tempora short, inconspicuous; head finely and sparsely punctate, smooth and shiny on surface between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin strongly excavate (fig. 48); anterior margin of labrum entire; antennomere ratios: length I:II:III = 2.3:1.0:1.5, width VII:VIII:IX = 0.9:1.0:1.7. Pronotum broad (PNL/PNW = 0.55), later-

ally not strongly produced, anterolateral angle subquadrate, posterolateral angle relatively strongly angulate; punctation and surface microsculpture slightly coarser than that of head. Elytra somewhat elongate (SEL/ELW = 1.08–1.11); punctation slightly coarser and more dense than on pronotum, some punctures in indistinct series, surface between punctures shiny and smooth; sutural stria about three-fifths length of elytron on most specimens. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina reduced on anterior portion. Metasternum relatively broad medially (MTL/MTW = 0.33–0.35), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; mandibular horn, when fully developed, long, curving posteriorly over front of head, subcircular throughout in cross-section, punctate and setose along its length, apical fovea prominent with large cluster of setae; metafemur moderately slender, unmodified; metasternal fovea small, anterior, with small brush of fine, dense setae. Median lobe in lateral aspect moderately slender, evenly curved, apical portion slender, gently curved dorsad, apex with small triangular, dorsal expansion (fig. 53); in ventral aspect moderately slender, lateral margins subparallel for most of length, slightly sinuate at base of apical portion which is subtriangular, and apically pointed (fig. 52); operculum broad, flat, apically divided with each ramus pointed and convergent (fig. 52); lateral lobes slender, evenly curved, apically expanded, prominently flattened, rounded, with two long, subapical setae (fig. 53).

Female tarsi 5-4-4.

DISTRIBUTION: This species is known from Alaska south to California and Nevada and across Canada to New Hampshire (fig. 86).

SPECIMENS EXAMINED: CANADA: *Alberta:* Jumpingground Creek, 6 Sep 1964, fungus under rotten log, BF and JL Carr (2, CARR); George Lake 50 km NW Edmonton, 11 Jun 1984, spruce-aspen forest, FIT, S and J Peck (1, PECK); Ghost Dam, 12 Jun 1980, BF and JL Carr (4, CARR).

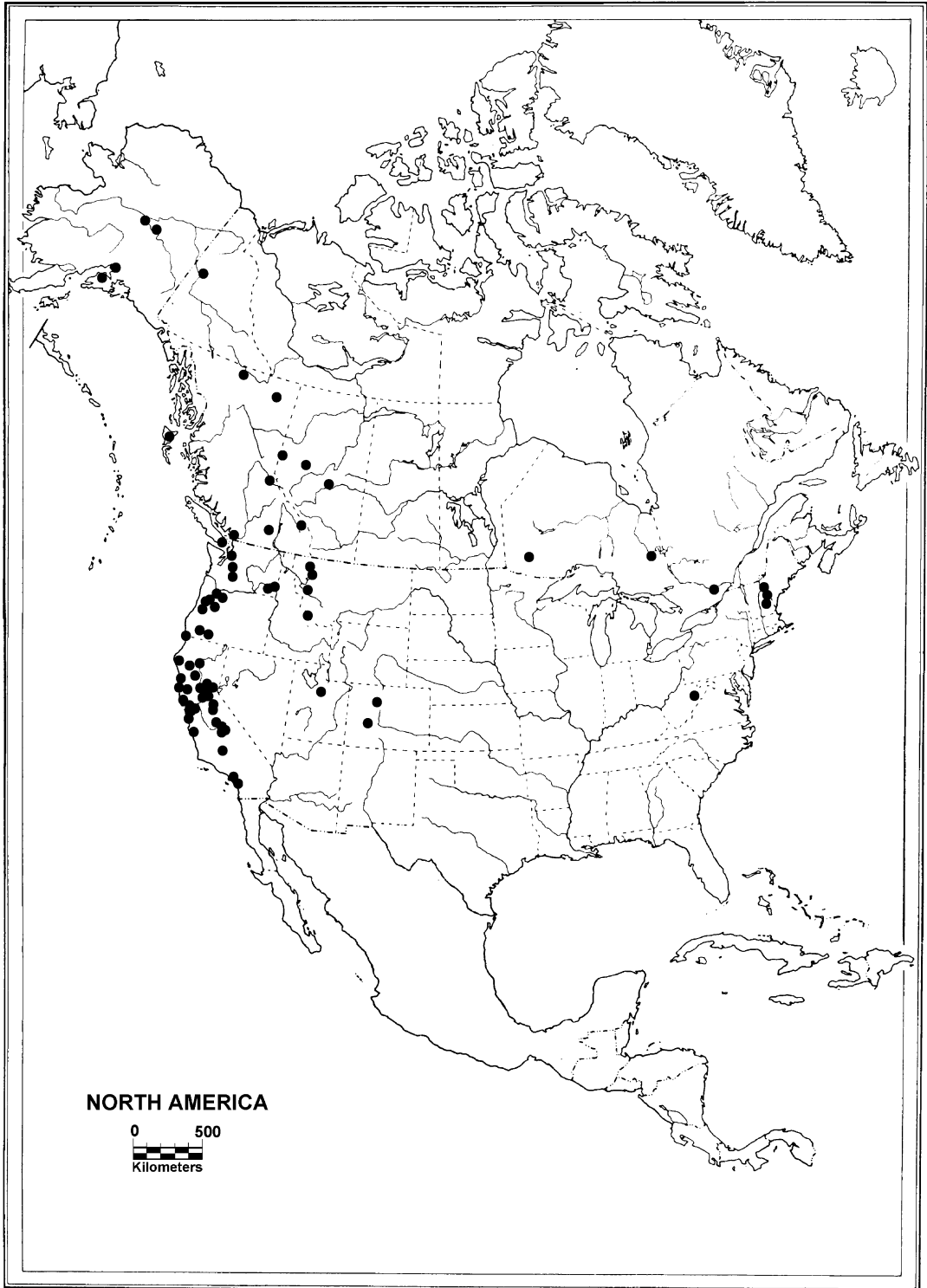


Fig. 88. Geographic distribution of *Agathidium pulchrum*.

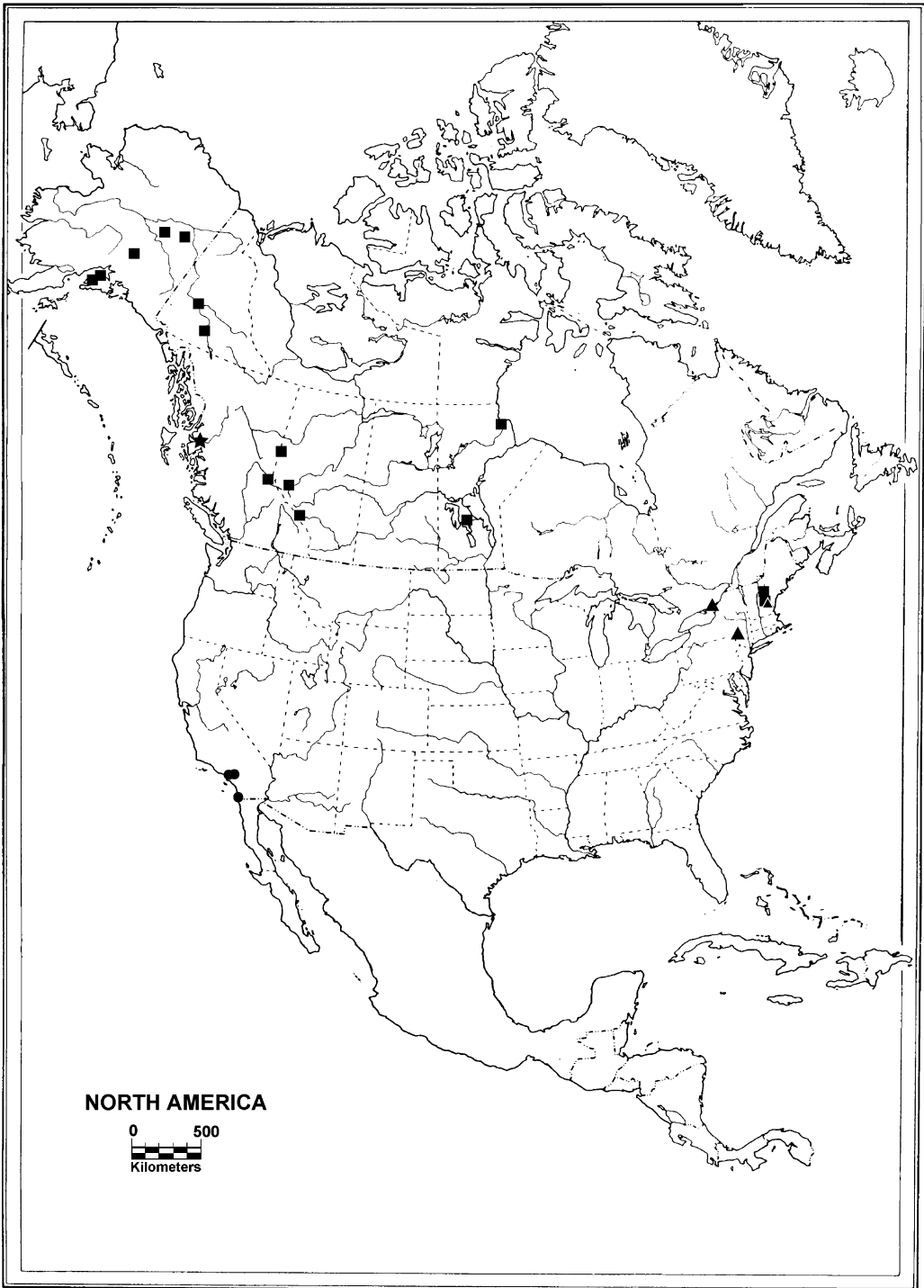


Fig. 89. Geographic distribution of *Agathidium pulchrum*-group species: *A. athabascanum* = ■; *columbianum* = ★; *A. laetum* = ●; *A. rusticum* = ▲.



Fig. 90. Geographic distribution of *Agathidium pulchrum*-group species: *A. amae* = ■; *A. repentinum* = ●.

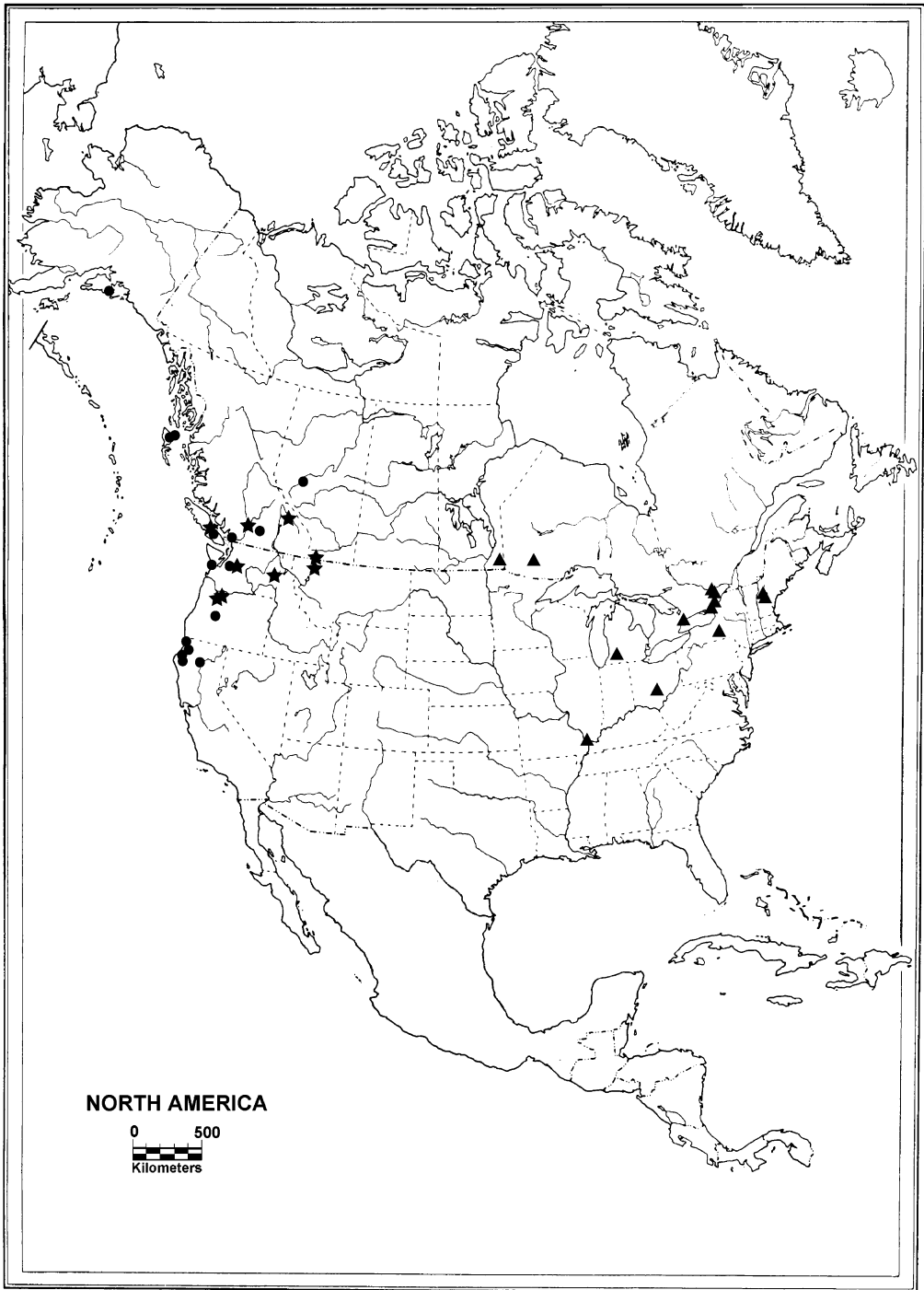


Fig. 91. Geographic distribution of *Agathidium pulchrum*-group species: *A. aristerium* = ▲; *A. marae* = ★; *A. rotundulum* = ●.

British Columbia: Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (7, CNCI); Alaska Hwy, 37 km W Ft Nelson, 12 Jun 1984, aspen-spruce forest, FIT, S and J Peck (3, PECK); Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (2, PECK); Lorna, 20 Jul 1924, R Hopping (1, CASC). *Ontario*: Smooth Rock Falls, 56 km NW Cochrane, 3 Jun 1984, mixed spruce-birch, evening car netting, S and J Peck (2, CNCI); 25 km W Ignace 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (1, PECK); Smooth Rock Falls 56 km NW Cochrane, 3 Jun 1984, mixed spruce birch, evening car netting, S and J Peck (3, PECK). *Quebec*: Duparquet, 18 Jun 1939, lake shore, GS Smith (1, CASC); Duparquet, 9 Jun 1939, GS Smith (1, CASC); Duparquet, 3 Jun 1948, GS Smith (1, CASC). *Saskatchewan*: Jay Jay Lake, Rt 102, 130 km NE Candle Lake, 8 Jun 1984, pine-fir forest, FIT, S and J Peck (2, CNCI); Turtle Lake Jct, 60 km S Meadow Lake, spruce-moss forest, FIT, S and J Peck (1, PECK). *Yukon*: Simpson Lake, 81 Km N Watson Lake, 15 Jun 1984, pine-willow, FIT, S and J Peck (1, PECK).

UNITED STATES: *Alaska*: Chena River Rec. Area, 30 mi E Fairbanks, 22 Jun 1984, spruce forest, malaise FIT, S and J Peck (4, PECK); Kenai Pen, Cooper Landing, Rt 1, 25 Jun 1984, poplar spruce forest, malaise FIT, S and J Peck (1, PECK); Kenai Pen, E Skilak Rd Jct Rt 1, 25 Jun 1984, aspen-spruce forest, malaise FIT, S and J Peck (15, PECK); Chena Ridge Rd, 5 mi W Fairbanks, 22 Jun 1984, poplar forest, malaise FIT, S and J Peck (5, PECK); Bonanza Creek Exp. Forest nr Fairbanks, 12 Jul 1989, on *Stemonitis*, SL Stephenson (1, CUIC); Houston, 24 Jun 1984, spruce-birch forest with moss, malaise FIT, S and J Peck (3, PECK); Seward, Salmon Creek, 27 Jun 1984, rotted log pile, S and J Peck (1, PECK); 35 mi N Willow Trapper Creek, mi 106, 23 Jun 1984, spruce-birch forest, malaise FIT, S and J Peck (2, PECK). *California*: Sequoia Natl Park, 11 May 1979, R Baranowski (2, LUND); El Dorado Co.: 0.5 mi N Stumpy Meadows Lake, 20 Apr 1989, 4200', F Andrews, Te Eichlin (1, FGAC); 7.7 mi SE Verner Blodgett Forest, 29 Mar 1984, under bark of *Pinus ponderosa*, FG Andrews (2, FGAC); Blodgett Forest 13 mi E Georgetown, 14 Jun 1967, PF Warner (1, WSUC); Lassen Co.: Ine Creek, 2 May 1950, HP Chandler (1, CASC); Pine Creek, 2 May 1950, 5200', HP Chandler (1, CASC); Pine Creek, 2 May 1950, 5000', HP Chandler (2, CASC); Mono Co.: Convict Creek, 24 May 1963 (1, FGAC); Nevada Co.: Sagehen Creek, 8 Jul 1970, CS Glaser (2, CASC); Tulare Co.: Sequoia Natl Park, Halstead Creek, 23 May 1984, 7000', R Baranowski (1, LUND); Tuolumne Co.: Tiog Rd 9 mi E Crane Flat, 18 May 1976,

squirrel middens and litter, fir forest, Berlese, A Newton, M Thayer (1, FMNH). *Montana*: Gallatin Co.: Bozeman Creek, 8 Jun 1987, 5300', DL Gustafson (1, MTEC); Judith Basin Co.: Little Belt Mts, 5 mi S Deadhorse Ck, 27 May 1988, 6600', FIT, CE Seibert (1, MTEC). *Nevada*: Washoe Co.: 1.5 mi W top of pass, Mt Rose, 27 Aug 1969, 8550', HB Leech (2, CASC). *New Hampshire*: White Mts (1, MCZC); Coos Co.: Norton Pool, 3 mi NE East Inlet Dam, 25 Jun 1986, FIT, DS Chandler (2, CNCI); Jefferson Notch, 20 Nov 1974, on "red tubular slime mold", A Newton (1, MCZC); 1 mi NE East Inlet Dam, 27 May 1986, FIT, DS Chandler (1, CNCI); 0.3 mi S Jefferson Notch, 23 Jul 1980, 895 m, *Picea-Abies* for., window trap, A Newton, M Thayer (2, MCZC); 1.0 mi S Jefferson Notch, 7 Nov 1975, 2700', litter fir-spruce-birch forest, Berlese, A Newton, M Thayer (1, MCZC); Mt Washington auto road, 1 Jul 1982, 3000', rotten birch, DS Chandler (1, DENH). *New York*: Adiron. Mt., Mt Seward [Adirondacks?], 22 Jun 1945 (1, MCZC); Mt. Whiteface, 25 Jul 1936 (1, CASC). *Oregon*: Clakamas Co.: 1.5 mi S Jct US 26 Oregon 35, 11 Jul 1975, mixed conifer forest litter, A Newton, M Thayer (3, FMNH); Klamath Co.: 2 mi S 2 mi W Lake of the Woods, 14 Nov 1972, 5700', rotten wood, E Benedict (6, CNCI).

DISCUSSION: Based on our examination of the holotype and two paratypes of *A. canadense*, we follow Fall's (1934b) synonymy of that species with *A. difforme*. This species has been collected throughout the year except during the winter months. It has been collected from flight intercept traps and sifting in a variety of forest types including fir, pine, spruce, birch, maple, and poplar. Elevation records are from 2700 to 8550 ft. Host records from label data include *Stemonitis* sp. and a "red, tubular slime mold".

Agathidium maculosum Brown
Figures 46, 49, 54, 55, 87

Agathidium maulosum Brown, 1928: 45 *lapsus calami*.

Agathidium maculosum, Fall, 1934b: 25; Hatch, 1957.

Agathidium maculosum var. *franciscanum* Fall, 1934b: 26.

TYPE MATERIAL: *Agathidium maculosum*: holotype ♂ in CNCI labeled "Victoria, B.C. 11.IV.1921 W. Downes/HOLOTYPHE *Agathidium maculosum* 2784 No. Brown [red label]".

Agathidium franciscanum: holotype ♂ in

MCZC labeled "Berkeley Cal I-8 1920 H. Dietrich [date handwritten]/♂/TYPE franciscanum [handwritten, "type" with red underline]/M.C.Z. Type 24037 [red label, number handwritten]/H. C. FALL COLLECTION."

TYPE LOCALITY: *Agathidium maculosum*: Canada, British Columbia, Victoria.

Agathidium maculosum var. *franciscanum*: United States, California, Berkeley.

DIAGNOSIS: This species can be distinguished by the prominent, irregular maculations on the elytra (figs. 46, 49), which distinguish the species from all others except *A. pulchrum* and *A. amae*, which it greatly resembles. From these species it differs by lacking a sutural elytral stria (fig. 49) and having the anterior clypeal margin less strongly excavated (fig. 49). The male operculum is very prominent, thick, and apically formed into two sharply pointed rami (fig. 54). Also, the macula at the base of the elytra is characteristically broad and extends in lateral, posteriorly directed lobes (fig. 49).

DESCRIPTION: Body moderately large (TBL = 2.72–3.17 mm), rotund (PNW/TBL = 0.47–0.53), laterally broadly rounded, moderately strongly contractile.

Head yellow-brown; pronotum yellow with large central area of brown; elytra yellow with brown along suture, anteromedially and in two elongate, often confluent medial spots, lateral one located slightly more anterad than other; venter yellow; antennae yellow with basal two club antennomeres brown and apical antennomere yellow; palpi yellow; legs yellow-brown to yellow.

Head broad (figs. 46, 49) (MDL/OHW = 0.55–0.56), dorsally flattened, without medial crease; tempora short, inconspicuous, forming a distinct rim at posterior margin of eye; head finely and sparsely punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately prominent medially; clypeal margin slightly excavate, extending about to level of anterolateral margins of frons (figs. 46, 49); labrum entire; antennomere ratios: length I:II:III = 2.0:1.0:1.9, width VII:VIII:IX = 0.9:1.0:2.0. Pronotum broad (PNL/PNW = 0.56–0.58), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive,

somewhat rounded; punctation similar to that of head. Elytra moderately robust (SEL/ELW = 0.89–1.17); lateral margins rounded; punctation moderately coarse but sparse, some in indistinct series, surface between punctures shiny and smooth; sutural stria absent. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum moderately broad medially (MTL/MTW = 0.26–0.31), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with moderately large ventral field of spatulate setae; mandibular horn, when fully developed, very long, extending posteriorly over front of head in long, slightly curved, flattened, parallel-sided horn, apex flattened and rounded, setose along its length, with prominent subapical fovea and marginal series of fine setae; metafemur slender, unmodified; metasternal fovea transverse, linear, curved, slightly anterior of middle, with line of fine setae. Median lobe in lateral aspect with long, prominent basal portion and submedial constriction, straight dorsad of constriction, apical portion slightly curved, robust, apically truncate (fig. 55); in ventral aspect slender, parallel-sided, apical portion moderately slender, evenly tapered to rounded apex (fig. 54); operculum broad, apically acuminate, pointed apex narrowly emarginate (fig. 54); lateral lobes slender, curved basally, apically pointed with 2 long, stout setae (figs. 54, 55).

Female tarsi 5-4-4.

DISTRIBUTION: This species occurs along the west coast of North America from central California north to British Columbia (fig. 87).

SPECIMENS EXAMINED: CANADA: *British Columbia*: Hotel Lake, Pender Harbor, 7 Jul 1920, GR Hopping (1, CASC); Victoria, Vancouver Island (1, OSUC).

UNITED STATES: *California*: state only (1, CASC); Berkeley, 8 Jan 1920 (9, MCZC); San Francisco Bay area, D Giuliani (1, CASC); Gln. Aplne., Jul (1, CASC); Alameda Co.: Redwood Canyon, 1 Jun 1920 (1, CASC); Redwood Canyon, 1 Jun 1920 (6, CASC); Redwood Canyon, 1 Jun 1920 (1, CASC); Contra Costa Co.: Moraga

Valley, 18 Apr 1932 (2, CASC); El Dorado Co.: Blodgett Forest, 27 Aug 1975, *Pinus ponderosa* log, Berlese, FG Andrews (3, FGAC); Camino, 7 Mar 1964, S Semonoff (1, FGAC); Humboldt Co.: Trinidad, 16 Oct 1984, malaise, F Adams (2, FGAC); Marin Co.: 14 Jan 1920, Deitrich (1, MCZC); Lagunitas, 9 Apr 1911, van Dyke (6, CASC); Taylorville, 28 Dec 1919 (1, CASC); Taylorville, 28 Dec 1919 (4, CASC); Mendocino Co.: Naverro River, 22 Nov 1932, RP Allen (2, CASC); 3 mi S Leggett, 20 Oct 1962, JF Lawrence (2, MCZC); Santa Clara Co.: Stevens Creek Area, 16 Apr 1956 (6, Utah St); Sonoma Co.: Sugar Loaf Ridge St Park, 4 Feb 1980, on *Polyporus* sp., A Hardy (1, FGAC). *Oregon*: Newport, 1 Nov 1961, K Goeden (1, RLWE); Astoria (1, OSUC); Croisan Gulch, S Salem, 24 Nov 1974, RL Westcott (4, RLWE); Clackamas Co.: Salmon River near Zigzag, 27 Aug 1982, R Baranowski (1, LUND); Lane Co.: Linslaw Co. Park 24 mi E Florence on Suislaw River, 6 May 1972, tree hollow, rotten wood (1, PECK); Marion Co.: Lake Selmac, 2 May 1969, RL Westcott (2, RLWE); Silver Falls SP, Hwy 214 at S entrance, 8 Nov 1974, RL Westcott (1, RLWE); Polk Co.: Homan Wayside, 4 May 1969, RL Westcott (1, RLWE); Yamhill? Co.: Champagne St. Park W Wilsonville, 1 Jan 1980, under bark (4, EMEC). *Washington*: Beutralia?? (1, MCZC); Olympic NP Dosewallips Ranger Station, 18 Jul 1966, W Gagne J Haddock (1, EMEC).

DISCUSSION: Brown (1928) erected this species under the name "*A. maulosum*". Since Brown apparently intended to name this species after its most distinguishing feature, the dorsal maculae, it seems likely that he meant to call it *A. maculosum*, and this is the name others have consistently used to refer to the species. Also, the name on the type label in CNCI is *A. maculosum*. Based on this evidence we regard *A. maulosum* as a *lapsus calami*. As further evidence that the original spelling was unintended, the description following Brown's description of *A. maculosum* is apparently also misspelled as "*Callops olahomensis*" rather than "*Callops oklahomensis*" for a species from Oklahoma.

Agathidium maculosum var. *franciscanum* was erected based on putative differences in punctuation and coloration. However, *A. m. franciscanum* is clearly the same species as typical *A. maculosum*, and we synonymize the names. Although Fall (1934b) claimed that the female tarsal formula is 4-4-4, we

have found it to be 5-4-4 in female specimens examined.

Agathidium maculosum has been collected during every month of the year. Label data indicate it has been found in rotting wood in conifer forests. A single elevation record is from 3600 ft. Host records include *Polyporus* sp. and a "slime mold".

A. pulchrum LeConte

Figures 21, 22, 44, 45, 51, 56, 57, 88

Agathidium pulchrum LeConte, 1853: 286; Horn, 1880; Leng, 1920; Fall, 1934b; Hatch, 1957; Silfverberg, 1979 (synonymized with *A. pulchellum* Wankowicz, 1869); Daffner, 1985 (distinguished from *A. pulchellum* Wankowicz, name resurrected); Wheeler, 1990 (description of larva).

Agathidium mandibulatum Mannerheim, 1853: 203; Horn, 1880 (synonymized with *A. pulchrum*); Leng, 1920.

TYPE MATERIAL: *Agathidium pulchrum*: lectotype (designated here to clarify assignment of this name to this species), ♂ in MCZC labeled "[circular gold disc]/TYPE 3176 2 [numbers handwritten, 2/3 of label red]/pulchrum 2 [handwritten]". LeConte did not indicate the number of specimens on which he based his description. We have selected a specimen from the MCZC that is labeled as the type to be the lectotype.

Agathidium mandibulatum: Type not examined.

TYPE LOCALITY: *Agathidium pulchrum*: United States, California, San Jose.

Agathidium mandibulatum: United States, Alaska.

DIAGNOSIS: This species can be distinguished by the prominent, irregular maculations on the elytra (figs. 44, 45, 51), which distinguish the species from all others except *A. maculosum* and *A. amae*, which it greatly resembles. From *A. maculosum* it differs by having a distinctive sutural elytral stria (fig. 51) and by having the anterior clypeal margin very strongly excavated (figs. 22, 51). Also, the male left mandibular horn, when fully formed, is more strongly curved (figs. 21, 22). The median lobe of the aedeagus in ventral aspect has the apical portion relatively broad and robust and the operculum reduced to a rounded, hyaline lobe (fig. 56), which distinguishes this species from both *A.*

maculosum and *A. amae*. Also, *A. pulchrum* generally has a greater extent of dorsal brown maculation (fig. 51) than does *A. amae* (fig. 50). The female has 5-4-4 tarsomeres.

DESCRIPTION: Body moderately large (TBL = 2.32–2.68 mm), rotund (PNW/TBL = 0.45–0.50), laterally broadly rounded, moderately strongly contractile.

Head dark brown to piceous with medial red spot, clypeus red; pronotum yellow with large medial dark red-brown macula; elytra yellow with dark red-brown to piceous coloration around margins, including sutural margin, and in sinuate, oblique medial line often dividing yellow into anterior and posterior maculae; thoracic sterna piceous, abdominal sterna red; basal antennomeres red, basal two antennomeres of club dark brown, apical antennomere yellow; palpi and legs yellow.

Head broad (fig. 51) (MDL/OHW = 0.49–0.64), dorsally flat, often with prominent transverse, medial crease; tempora moderately prominent, extending posteriorly in same plane as eye about one-sixth length of eye, moderately laterally protuberant (figs. 22, 51); head finely to moderately punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin strongly excavate (figs. 22, 51); labrum anteromedially excavate; antennomere ratios: length I:II:III = 2.3:1.0:1.4, width VII:VIII:IX = 1.0:1.0:2.3. Pronotum broad (PNL/PNW = 0.55–0.58), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, but rounded; punctation similar to that of head. Elytra moderately elongate, lateral margins rounded (SEL/ELW = 1.09–1.10); punctation slightly coarser than pronotum, but fine and sparse, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens, prominent. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.30–0.32), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with large ventral field of spatulate setae; mandibular horn, when fully developed, very long, curving anteriorly, then posteriorly over front of head (figs. 21, 22, 44, 45), subcircular throughout in cross-section, punctate and setose along its length, apical fovea prominent with large cluster of setae; metafemur slender, unmodified; metasternal fovea anterior, moderately large, transversely ovoid with large cluster of fine, dense setae. Median lobe in lateral aspect robust, broad basally, narrowing evenly throughout, slightly curved near base, with distinct indentation medially on ventral surface, apical portion flattened, slender, curved gently dorsad, apically very narrowly rounded (fig. 57); in ventral aspect moderately broad basally, slightly tapered throughout length, slightly constricted at base of apical portion with is evenly narrowed to pointed apex (fig. 56); operculum reduced to an inconspicuous, flattened hyaline lobe (fig. 56); lateral lobes long, slender, apically slender and slightly curved ventrad, apices narrowly rounded with 2 long, stout setae (figs. 56, 57).

Female tarsi 5-4-4.

DISTRIBUTION: *Agathidium pulchrum* is known from throughout western North America from Alaska south to California and Colorado and east to New Hampshire and West Virginia (fig. 88). It is one of the most common species found in northwestern North America.

SPECIMENS EXAMINED: "W.T.", [probably Washington Territory] (1, MCZC).

CANADA: *Alberta*: Tp20Rg8W5 mer, 14 Jun 1964, pine logs, BF and JL Carr (2, CARR); Tp15Rg4W5 mer, 12 Jul 1961, BF and JL Carr (1, CARR); Tp15Rg4W5 mer, 12 Jul 1961, BF and JL Carr (2, CARR); Fox Creek, 80 km S Valley View, 12 Jun 1984, spruce-aspens forest, S and J Peck (2, CNCI); Fox Creek, 80 km S Valleyview, 12 Jun 1984, spruce-aspens forest, FIT, S and J Peck (5, PECK); George Lake, 50 km NW Edmonton, 11 Jun 1984, spruce-aspens forest, FIT, S and J Peck (2, CNCI); Sibbold Flats Rec. Area, 6 Sep 1981, FIT, RS Anderson (6, CNCI); Jumping-ground Creek, 12 Jul 1959, under spruce bark, BF and JL Carr (6, CARR); 11 mi NE Robb, 4 Aug 1985, lodgepole pine forest, FIT, RS Anderson (3, CNCI); Demmitt, 3 km W 90 km NW Grand Prairie, 12 Jun 1984, poplar forest, FIT, S and J Peck

(10, CNCI); Demmitt, 3 km W 90 km NW Grand Prairie, 12 Jun 1984, poplar forest, FIT, S and J Peck (18, PECK); George Lake 50 km NW Edmonton, 11 Jun 1984, spruce-aspen, FIT, S and J Peck (3, PECK). *British Columbia*: Pink Mtn, George Lake, 252 km S Ft Nelson, Rt 97, 12 Jun 1984, aspen forest, FIT, S and J Peck (1, CNCI); near Mabel Lake at Squaw Valley, 5 Aug 1982, R Baranowski (2, LUND); Kootenay Natl Park, 17 Jul 1985, on *Stemonitis*, SL Stephenson (11, CUIC); Yoho Park, 23 Jun 1962, BF and JL Carr (1, CARR); Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (2, PECK); Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (1, CNCI); mile 49 Alaska Highway, 30 Jun 1955, shelf fungi, BF and JL Carr (1, CARR); Monashee Mtn near Cherryville, 8 Aug 1982, 1400–1600 m, R Baranowski (1, LUND); Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (7, CNCI); Alaska Hwy 37 km W Ft Nelson, 12 Jun 1984, aspen-spruce forest, FIT, S and J Peck (9, PECK); Burnaby, 6 Jul 1984, 1300', alderpan, D Miller (1, CNCI); Victoria, Vancouver Island, 3 Jun (1, OSUC); Alaska Hwy, 37 km W Ft Nelson, 12 Jun 1984, aspen-spruce, FIT, S and J Peck (10, PECK); Pink Mountain, 25 km S Ft Nelson, Rt97, 12 Jun 1984, aspen forest, FIT, S and J Peck (10, PECK); Queen Charlotte Islands Graham Island 1 mi NW Tiell, 27 Jun 1984, sitka spruce/hemlock forest, RS Anderson (15, CNCI); Toco, 28 Apr 1984, R and J Camenisch (14, CNCI); Lorna, 12 Jul 1926, H Richmond (1, CASC); 8 mi S Purden Lake Prov. Parks, 24 Jun 1984, white spruce/moss forest, FIT, RS Anderson (7, CNCI); 14 km E Coal River 160 km E Watson Lake, YT, 14 Jun 1984, spruce-alder forest, FIT, S and J Peck (2, PECK). *Ontario*: 25 km W Ignace 75 km E Dryden, 5 Jun 1984, fir-maple, FIT, S and J Peck (1, PECK); Manitoulin Island 2 mi S Maple Pt, 1 Jun 1982, FIT, A Ritchie (1, CNCI); Smooth Rock Falls 56 km NW Cochrane, 3 Jun 1984, mixed spruce-birch, evening car netting, S and J Peck (1, CNCI). *Quebec*: Gatineau Park nr Pinks Lake, 26 Apr 1980, FIT, S Peck (3, CNCI). *Yukon*: Moose Creek 14 km NW Stewart Cross, 18 Jun 1984, stream willow thicket, malaise FIT, S and J Peck (1, PECK).

UNITED STATES: *Alaska*: Chena River Rec. Area 30 mi E Fairbanks, 22 Jun 1984, spruce forest, malaise FIT, S and J Peck (2, PECK); Kenai Pen, E Skilak Rd Jct Rt 1, 25 Jun 1984, aspen-spruce, malaise FIT, S and J Peck (1, PECK); Chena Ridge Rd, 5 mi W Fairbanks, 22 Jun 1984, poplar forest, malaise FIT, S and J Peck (1, PECK); Bonanza Creek Exp. Forest nr Fairbanks, 12 Jul 1989, on *Arcyria nutans*, SL Stephenson (1, CUIC); Houston, 24 Jun 1984, spruce-birch

forest with moss, malaise FIT, S and J Peck (1, PECK); 35 mi N Willow Trapper Creek, mi 106, 23 Jun 1984, spruce-birch forest, malaise FIT, S and J Peck (4, PECK); Chena Ridge Rec. Area 30 mi E Fairbanks, 22 Jun 1984, spruce forest, malaise FIT, S and J Peck (7, PECK); Nenana, 13 mi NE Rt 3, mi 318, 27 Jul 1984, birch-spruce, malaise FIT, S and J Peck (2, PECK). *California*: state only (14, MCZC); Sta Cruz Mts (3, CASC); Oakland, 19 Apr 1919 (1, CASC); Sacramento (2, MCZC); Gln. Alpine, Jul, A Fenyes (2, MCZC); Santa Cruz Mts (12, CASC); Sunol, 8 May 1921 (1, EMEC); Kaweah (1, MCZC); Berkeley, 13 Apr 1961, JF Lawrence (3, EMEC); Wishon, 7 Jun 1938 (1, EMEC); Pasadena, 20 Oct 1907 (1, MCZC); Pomona, 2 Jun 1898 (1, MCZC); Strawberry Canyon, Berkeley Hills, 4 May 1963, on *P. versicolor*, Doyen (1, EMEC); Kaweah, Hopping (2, MCZC); Sequoia Natl Park, 9 May 1979, R Baranowski (3, LUND); Kaweah, Hopping (1, CASC); Berkeley, 22 Feb 1960, JF Lawrence (1, MCZC); Wishon, 7 Jun 1938, NA Olson (3, EMEC); Sequoia Natl Park, 9 May 1979, R Baranowski (1, LUND); Alameda Co.: Arroyo Moch, 2 Mar 1958 (4, EMEC); Niles Canyon, Mar 1971, T Taylor (2, PECK); 22 mi SE Livermore, 24 Mar 1976, FG Andrews (8, FGAC); Oakland, 22 Mar 1952, *Quercus* litter, R Schuster (5, EMEC); Amador Co.: Peddler Hill, 7000', 27 Jun 1975, under bark of conifer, A Newton, M Thayer (3, MCZC); 1 mi W Pine Grove, 24 Jun 1975, litter, mixed conifer forest, A Newton, M Thayer (2, MCZC); Butte Co.: Feather Falls, 16 May 1971, DS Chandler (1, CASC); Contra Costa Co.: Moraga Valley, 18 Apr 1932, FE Blaisdell (3, CASC); Jun 1935 (3, CASC); 2 mi SE Canyon, 4 Feb 1967, on *Stereum* on *Umbellularca*, J Powell (2, EMEC); El Dorado Co.: 1 mi W Grizzly Flat, 24 Mar 1982, under oak bark, FG Andrews (1, FGAC); 0.7 mi E Pacific House, 16 Apr 1992, screening flume, FG Andrews (1, FGAC); Placerville, 3 mi N, Nov 1962, on *Polyporus versicolor*, R Schuster (1, MCZC); Humboldt Co.: Pepperwood, 12 Jun 1959, TR Haig (1, FGAC); Patrick Point St Park, 4 Aug 1976, FG Andrews (1, FGAC); Kern Co.: 5 mi NE Caliente, 18 Apr 1986, A Hardy, T Eichlin, F Andrews (1, FGAC); Lake Co.: Adams Springs, 24 Apr 1976, under bark of dead oak, JF Lawrence (1, MCZC); Upper Lake, 12 mi N, 18 Mar 1965, 2800', J Doyle (2, EMEC); Los Angeles Co.: county only (1, CASC); Fuchs (1, CASC); Winter Creek, Santa Anita Canyon, 9 Jan 1944, DL Tilmann (2, EMEC); Marin Co.: PT Reyes, Mt Vision, 25 Feb 1982, on slime mold, *Arcyria*, FG Andrews (6, FGAC); 3 mi NW Inverness, 18 Mar 1983, laurel and oak litter, DS Chandler (1, DENH); 2 mi S Kentfield, 4 Oct 1974, JT Doyen (1, EMEC);

- Point Reyes Natl Seashore, Mt Vision, 17 Jan 1985, under logs, F Andrews, T Eichlin (4, FGAC); Inverness, 8 Nov 1953, R Schuster (1, EMEC); Inverness, 16 May 1952, HB Leech (1, CASC); Taylorville, 28 Dec 1919 (1, CASC); Alpine Lake, 30 Jan 1960, on *Polyporus versicolor* on *Umbellularia californica*, JF Lawrence (2, MCZC); Lagunetas Canyon, 7 Apr 1946, 1000', HP Chandler (1, CASC); Liberty Gulch nr Alpine Lake, 3 May 1980 (1, EMEC); Reyes Natl Seashore, Mt Vision, 17 Jan 1985, under logs, F Andrews and T Eichlin (1, FGAC); Mendocino Co.: Ryan Creek, 7 Mar 1954, PD Hurd (1, EMEC); Fort Bragg, 19 Jun 1984, R Baranowski (2, LUND); Hopland Field Sta. HQ Lake, 15 May 1977, J Powell (1, EMEC); Monterey Co.: Arroyo Seco, 5 May 1956, P Torcato (1, Utah St); Nevada Co.: Sagehen Creek, 8 Jul 1970, CS Glaser (1, CASC); Wolf Mtn 5 mi SW Grass Valley, 5 May 1980, JT Doyen (1, EMEC); Placer Co.: 4.7 mi W Foresthill, road to Auburn, 27 Nov 1965, 2280', H Leech (1, CASC); Santa Clara Co.: Guadalupe Res., 2 Mar 1973, on "in shell fungus" (1, EMEC); Mt. Hamilton, 17 Feb 1973 (1, EMEC); 2 mi SW Los Gatos, 6 May 1961, on *Lenzites betulina*, WE Ferguson (1, MCZC); Santa Cruz Co.: 9 mi NE Big Barn??, 24 Mar 1962, 2500', HP Chandler (1, CASC); Jun 1896 (1, WSUC); Nunenmac, 1896 (1, MCZC); Ben Lomond, 25 Nov 1962, on *Polyporus versicolor* (1, MCZC); Sonoma Co.: 24 Feb 1971 (2, CASC); Trinity, 7 Mar 1937, NW Frazier (4, EMEC); Tehama Co.: 1 mi E Flournoy, 20 Mar 1983, oak litter, wood rat nests, DS Chandler (1, DENH); Trinity Co.: 5 mi SE Peanut, 21 May 1973, under bark *Pinus ponderosa*, J Doyen (4, EMEC); Tulare Co.: Sequoia Natl Park., Dorst Creek, 31 May 1984, 7000', R Baranowski (3, LUND); Sequoia Natl Park, 24 May 1984, 7000', R Baranowski (4, LUND); Sequoia NF 9.2 mi S Kaweah Camp, 13 May 1976, 3200', wet debris, small stream, A Newton, M Thayer (1, MCZC); Sequoia Natl Park, nr Auto Log, 2 Jun 1984, 6000', R Baranowski (1, LUND); Ash Mountain, 17 Mar 1984, flume forebay, R Haines (2, FGAC); 16 mi NE Ash Mtn HQ, 30 Apr 1979, red rotten *Pseudotsuga* with slime mold, JT Doyen (10, EMEC); Sequoia Natl Park, Lost Grove, 4 Jun 1984, 7000', R Baranowski (1, LUND); 10 mi SE Three Rivers, S Fk Kaweah R., 29 Apr 1979, punky *Salix* wood, JT Doyen (1, EMEC); Tuolumne Co.: 7 mi NE Strawberry, 13 Jun 1962, JF Lawrence (1, MCZC); 4 Jul 1936, JE Blum (1, CASC); Yuba Co.: Dry Creek, 4 mi NW Smartville, 3 May 1980, under bark dead *Pinus sabiniana*, JT Doyen (2, EMEC); Spencerville Wildlife area, 14 Apr 1978, FG Andrews (32, FGAC); 1 mi W Strawberry Valley Ranger Sta., 6 May 1980, 3600', on slime mold on *Pseudotsuga*, JT Doyen (1, EMEC); Sierra Foothill Field Sta. 6 mi N Smartville, 4 May 1980, 1500–1900', under bark dead *Pinus sabiniana*, JA Powell (4, EMEC); Spencerville Wildlife Area, 14 Apr 1978, FG Andrews (2, FGAC). **Colorado:** Grand Co.: 21 Aug 1983, on *Acryria nutans*, SL Stephenson (2, CUIC); Gunnison Co.: 18 Aug 1983, on *Stemonitis flavogenita*, SL Stephenson (1, CUIC); 17 Aug 1983, 10700', on *Acryria nutans*, SL Stephenson (3, CUIC). **Idaho:** Smith Mtn, 29 Jul 1977, under bark, BF and JL Carr (1, CARR); Lemhi Co.: continental divide 2.4 mi airline SW of Bannock Pass, 24 Aug 1969, HB Leech (1, CASC). **Montana:** Flathead Co.: 9 Jul 1985, 6700', *Acryria versicolor*, SL Stephenson (1, AMNH); Noisy Creek, 30 Jun 1989, on *Tubifera ferruginea*, SL Stephenson (1, CUIC); Lake Co.: 29 Jun 1985, 3100', on *Stemonitis*, SL Stephenson (1, CUIC); Missoula Co.: 8 Jul 1985, 3500', on *Tubifera ferruginosa*, SL Stephenson (1, CUIC). **New Hampshire:** Mt Washington, 1 Aug 1926, Darlington (1, MCZC); White Mts (3, MCZC); Carr Co.: The Bowl, 2.5 mi NW Wonalancet, 9 May 1985, FIT, DS Chandler (7, CNCI); 1 mi N Wonalancet E Park Spring Brk, 22 Jun 1985, FIT, DS Chandler (2, CNCI); Coos Co.: 1 mi NE East Inlet Dam, 27 May 1986, FIT, DS Chandler (2, CNCI); Norton Pool, 3 mi NE East Inlet Dam, 25 Jul 1986, FIT, DS Chandler (3, CNCI); 3 mi S Jefferson Notch, 23 Jul 1980, 895 m, *Picea-Abies* forest, window trap, A Newton, M Thayer (2, MCZC); Mt Washington, Halfway House, 25 Jun 1982, birch, fir litter, DS Chandler (2, DENH); Straff. Co.: 1 mi SW Durham, 27 Apr 1987, FIT, DS Chandler (1, CNCI); Hubbard Brook Exp Forest, Bear Brook, 6 Jul 1983, rotten wood, DS Chandler (2, DENH); 4 mi W Durham, 14 Jun 1982, window trap, RM Reeves (3, DENH). **Oregon:** Blodgett, 29 Jul 1927, PJD (1, MCZC); Grants Pass, 20 Jun 1963, PP Larson (1, RLWE); Benton Co.: Mary's Peak, 20 Jun 1970, on polyporous fungus, RL Westcott (1, RLWE); Clackamas Co.: 1 mi S Barton, 22 Jun 1972, moss duff, E Benedict (1, CNCI); 1.5 mi S jct US 26, Ore 35, 11 Jul 1975, 3500', litter, mixed conifer forest, Berlese, A Newton, M Thayer (1, MCZC); Clackamas Co.: Salmon River, nr Zigzag, 28 Aug 1982, R Baranowski (3, LUND); Curry Co.: 6.7 mi NE Brookings, 4 Jul 1975, 100', litter, mixed hardwood forest, A Newton, M Thayer (1, MCZC); Klamath Co.: 2 mi S 2 mi W Lake of the Woods, 14 Nov 1972, 5700', rotten wood, E Benedict (1, CNCI); Marion Co.: 2 mi W Mehama, 27 Mar 1970, RL Westcott (1, RLWE); Polk Co.: Eola Hills nr Holman Wayside, 4 May 1969, RL Westcott (2, RLWE). **Utah:** Alta (1, MCZC). **Washington:** Rainier, Longmire Mts, 12 Aug 1927, Darlington

(2, MCZC); Seattle (2, WSUC); Columbia Co.: Tucannon River 21 mi S Marengo, Umatilla NF, 18 May 1974, under *Pinus ponderosa* bark, WJ Turner (6, WSUC); Pierce Co.: Mt Rainier, 1.7 mi N Jct W Side Rd, WA 76, 20 Jul 1975, 2400', M Thayer, A Newton (2, FMNH); Mt Rainier NP, 4.7 mi W Longmire, 20 Jul 1975, 2200', on *Trichea decipiens*, A Newton, M Thayer (4, MCZC); Whitman Co.: Lyle Grove 8 mi SW Pullman, 28 Apr 1973, under *Pinus ponderosa* bark, LC Wright (1, WSUC). *West Virginia*: Randolph Co.: 14 Aug 1983, 3400', on *Comatricha*, SL Stephenson (1, CUIC).

DISCUSSION: We did not examine the type specimens of *A. mandibulatum*, and we follow Horn's (1880) synonymy of this name with *A. pulchrum*. This species has been collected during every month, though most records are from May to September. Habitat data are mainly from forests including many different types of conifers and deciduous trees, from moss duff, and from riparian areas. Elevation records are from sea level to 7000 ft. Host records from label data include *Acryria nutans*, *Comatricha* sp., *Lenzites betulina*, *Polyporus versicolor*, *Stemonitis* sp., *Stemonitis flavogenita*, *Stereum* sp., *Trichea decipiens*, *Tubifera ferruginea*, "in shell fungus", and "slime mold."

Daffner (1985) resurrected this name from synonymy with *A. pulchellum* Wankowicz (synonymy by Silfverberg (1979)) and figured the male and female genitalia. The larva of this species was described in detail by Wheeler (1990).

Agathidium amae Miller and Wheeler,
new species
Figures 50, 58, 59, 90

TYPE MATERIAL: Holotype, ♂ in CASC labeled "CALIF: Placer Co. Kings Beach along Griff Creek V-26-85 6600' Fred G. Andrews/collected under bark Pseudotsuga menziesii/HOLOTYPE *Agathidium amae* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, California, Placer Co., Kings Beach along Griff Creek, 6600'.

DIAGNOSIS: This species is very similar to *A. pulchrum* and *A. maculosum* in general shape, presence of prominent dorsal maculation (fig. 50), and similar male genitalia. In

these three species there is a small cavity medially on the ventral margin of the median lobe of the aedeagus (figs. 55, 57, 59). *Agathidium amae* differs from *A. maculosum* in possessing a prominent sutural stria (fig. 50). Also, the operculum of the median lobe of the aedeagus is hyaline and indistinct in *A. amae* (fig. 58), whereas in *A. maculosum* it is very prominent (fig. 54). From *A. pulchrum* this species differs in generally being more lightly maculate (with more extensive yellow coloration dorsally) (fig. 50), and the apical portion of the median lobe of the aedeagus is much more evenly narrowed in ventral aspect (fig. 58).

DESCRIPTION: Body moderately large (TBL = 2.38–2.57 mm), rotund (PNW/TBL = 0.46–0.49), laterally broadly rounded, moderately strongly contractile.

Head yellow-brown; pronotum yellow-orange; elytra yellow-orange with diffuse brown triangle basally and with brown along anterior and lateral margins, often with elongate oval brown macula medially, which is confluent with anteromedial brown triangle in some specimens (fig. 50); venter yellow except metasternum, which is dark red-brown to piceous; antennae yellow, basal two club antennomeres brown, apical antennomere yellow; palpi yellow; legs yellow-brown to yellow.

Head broad (fig. 50) (MDL/OHW = 0.51–0.63), dorsally flattened, without medial crease; tempora short, inconspicuous, forming a distinct rim at posterior margin of eye; head finely and sparsely punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately prominent medially; clypeal margin strongly excavate (fig. 50); labrum broadly emarginate along anterior margin; antennomere ratios: length I:II:III = 2.1:1.0:1.9, width VII:VIII:IX = 1.0:1.0:1.8. Pronotum broad (PNL/PNW = 0.57–0.58), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, more rounded than anterolateral angle; punctuation similar to that of head. Elytra moderately robust (SEL/ELW = 1.01–1.05); lateral margins rounded; punctuation moderately coarse but sparse, some in indistinct series, surface between punctures shiny and smooth; sutural stria prominent, extending

about one-half length of elytron. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum moderately broad medially (MTL/MTW = 0.29–0.32), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with moderately large ventral field of spatulate setae; mandibular horn, when fully developed, very long, extending posteriorly over front of head in long, curved, rounded horn, apex rounded, setose along its length, with prominent subapical fovea and marginal series of fine setae; metafemur slender, unmodified; metasternal fovea round, located slightly anterior of middle, with cluster of fine setae. Median lobe in lateral aspect with prominent basal portion and submedial constriction, straight dorsad of constriction, apical portion slightly curved, robust, apically rounded (fig. 59); in ventral aspect slender, parallel-sided, apical portion moderately slender, evenly tapered to rounded apex (fig. 58); operculum inconspicuous, narrow, hyaline, apically narrowly rounded (fig. 58); lateral lobes slender, curved basally, apically pointed with 2 long, stout setae (figs. 58, 59).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named in honor of the wife of the senior author, Amy Beth Miller, for her considerable contribution to his life and support of his research efforts.

DISTRIBUTION: This species is known only from California and Washington (fig. 90).

PARATYPES: Sixteen paratypes were examined from the following localities: UNITED STATES. *California*: Butte Co.: 5 mi NE Butte Meadows, Cherry Hill Cpgd, 24 May 1974, FG Andrews (4, FGAC); El Dorado Co.: 1 mi W Grizzly Flat, 24 Mar 1982, under oak bark, F Andrews (1, FGAC); Blodett Exp. For. 14 mi E Georgetown, 8 May 1976, J Doyen (1, EMEC); Yuba Co.: 1 mi W Strawberry Vy. Rang. Sta., 6 May 1980, 3600', on slime mold on *Pseudotsuga*, JT Doyen (9, EMEC); Washington; Olympic NP, 20 Jun 1984, R Danielsson (1, LUND).

Agathidium laetum Fall

Figures 6, 60, 61, 89

Agathidium laetum Fall, 1934b: 118.

TYPE MATERIAL: Lectotype (designated

here to clarify assignment of this name with this species), ♀ in MCZC labeled "Pasadena Cal./TYPE laetum ["TYPE" underlined in red, "laetum" handwritten]/M.C.Z. Type 24039 [red label, number handwritten]/H. C. FALL COLLECTION/LECTOTYPE *Agathidium laetum* Fall, des. Miller and Wheeler, 2002 [red label with black line border]". Fall ordinarily designated holotypes, but in the case of this species he did not, possibly because he had two females and no male.

TYPE LOCALITY: United States, California, Pasadena.

DIAGNOSIS: This species can be differentiated from other members of the group by the concolorous elytra, the anterior clypeal margin broadly convex and extending distinctly beyond the anterolateral margins of the frons (fig. 6), the mesosternum with a prominent, flattened lobe extending ventrally between the mesocoxae, the male left mandible without a horn, the median lobe in ventral aspect broadly expanded apically (fig. 60), and the operculum with a prominent, deep, narrow medial emargination (fig. 60). Females have 4-4-4 tarsi.

DESCRIPTION: Body small (TBL = 2.46–2.47 mm), robust (PNW/TBL = 0.41–0.43), laterally broadly rounded, weakly contractile.

Head and elytra red; pronotum red with yellow around margins; venter yellow-brown; antennae, palpi and legs red-yellow.

Head relatively elongate (fig. 6) (MDL/OHW = 0.74–0.78), dorsally flattened, without medial crease; tempora very short, inconspicuous; head finely and sparsely punctate, coarser anteromedially, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture indistinct medially; clypeal margin curved, extending slightly but distinctly beyond anterolateral margins of frons (fig. 6); labrum entire; antennomere ratios: length I:II:III = 2.1:1.0:1.2, width VII:VIII:IX = 1.0:1.0:1.8. Pronotum broad (PNL/PNW = 0.59–0.61), lateral margin relatively broad, laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, somewhat rounded; punctation similar to that of head, fine and sparse. Elytra broad and robust (SEL/ELW = 1.13–1.16); lateral margins rounded; punctation coarse, moderately dense, some arranged in indistinct, irregular

series, surface between punctures shiny and smooth; sutural stria absent. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae, anterior portion extremely short; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.35–0.42), slightly convex, nearly glabrous; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; left mandible not modified; metafemur slender, unmodified; metasternal fovea double, comprised of a large, round brush of fine setae on each side of midline slightly anterad of middle. Median lobe in lateral aspect with large robust basal portion and constriction, area distad of constriction slender, curved, apical portion slender, directed slightly dorsad, apically slightly expanded and truncate (fig. 61); in ventral aspect slender basally, evenly expanded to apical portion, which is broad, apically abruptly narrowed to broadly rounded apex (fig. 60); operculum broad, flat, apically broadly rounded with deep, narrow, medial emargination (fig. 60); lateral lobes long, slender, apically narrowly rounded, with 2 long, stout setae (figs. 60, 61).

Female tarsi 4-4-4.

DISTRIBUTION: This species is known from southern California (fig. 89).

SPECIMENS EXAMINED: UNITED STATES. *California*: Sierra Madre (1, CASC); Pasadena (1, MCZC); Pasadena, Feb (7, CASC); Pasadena, 15 Apr 1905, paralectotype (1, MCZC); San Diego, FE Blaisdell (2, CASC).

DISCUSSION: This small species has been relatively rarely collected, despite its occurrence in California, a relatively heavily collected area. The only habitat record is from leaf litter in a mixed hardwood and conifer forest.

Agathidium athabascanum Fall
Figures 7, 62, 63, 89

Agathidium athabascanum Fall, 1934b:119.

Agathidium alticola Fall, 1934b:120. NEW SYNONYM.

TYPE MATERIAL: *Agathidium athabascanum*: holotype, ♂ in MCZC labeled "Jasper Park Alb. VIII 4 '24/♂/TYPE athabasca-num

[name handwritten, red line under "TYPE"]/M.C.Z. Type 24028/H.C. FALL COLLECTION/Agathidium athabascanum Fall [handwritten, red line around border]".

Agathidium alticola: holotype, ♂ in MCZC labeled "Wt Mts N.H. Subalp/♂/TYPE alticola [name handwritten, red line under "TYPE"]/M.C.Z. Type 19572 [number handwritten, red label]/H.C. FALL COLLECTION."

TYPE LOCALITY: *Agathidium athabascanum*: Canada, Alberta, Jasper Park.

Agathidium alticola: United States, New Hampshire, White Mountains.

DIAGNOSIS: This species differs from other members of this group by the concolorous, light brown dorsal surfaces, the anterior clypeal margin convex and extending distinctly, but not greatly, beyond the anterolateral margins of the frons (fig. 7), the mesosternum without a ventrally extending, flattened lobe between the mesocoxae, males without a left mandibular horn, the median lobe of the aedeagus in lateral aspect with the apex very sharply pointed and strongly curved dorsad (fig. 63), and the operculum apically expanded and medially distinctly emarginate (fig. 62). Females have 5-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 2.18–2.67 mm), robust, broadly rounded (PNW/TBL = 0.49–0.57), moderately contractile.

Head, pronotum, and elytra yellow-brown to yellow-red; venter yellow to yellow-brown; antennae and palpi yellow; legs yellow to yellow brown.

Head broad (fig. 7) (MDL/OHW = 0.58), somewhat convex, without transverse, medial crease; tempora short, often forming distinct rim at posterior margin of eye (fig. 7); head moderately coarsely punctate, with two puncture sizes, large and fine micropunctules interspersed, some specimens nearly impunctate; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin curved, extending distinctly beyond anterolateral margins of frons (fig. 7); anterior margin of labrum entire; antennomere ratios: length I:II:III = 1.6:1.0:1.4, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum broad (PNL/PNW = 0.51–0.54), laterally not strongly produced, anterior margin not strongly concave, antero-

lateral angle subquadrate, posterolateral angle distinctive, but rounded; punctation and surface microsculpture similar to that of head, some specimens nearly impunctate. Elytra robust, broad (SEL/ELW = 0.83–0.99); coarsely punctate, more dense apically, not in series, with fine irregular microreticulation on surfaces between punctures; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum relatively broad medially (MTL/MTW = 0.36), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; left mandible unmodified in all specimens examined; metafemur very slender, otherwise unmodified; metasternal fovea small, slightly anterad of middle, slightly transverse with small brush of fine, dense setae. Median lobe in lateral aspect robust, with large basal region and sub-basal constriction, broad and slightly curved distad of constriction, apical portion long, slender and strongly and evenly curved dorsad (fig. 63); in ventral aspect broad, lateral margins subparallel, apical portion broad, broadly acuminate to sharp apex, orifice large (fig. 62); operculum fused to proximal margin of orifice, long, flat, slightly expanded, apex broad and medially emarginate (fig. 62); lateral lobes long, slender, curved basally, apex narrowly rounded with 2 long setae (figs. 62, 63).

Female tarsi 5-4-4.

DISTRIBUTION: This far northern species is known from Alaska and the Yukon south through British Columbia and Alberta east to high elevation areas of New Hampshire (fig. 89).

SPECIMENS EXAMINED: CANADA: *Alberta:* Jumpingground Creek, 20 Oct 1962, forest litter, BF and JL Carr (4, CARR); Elke Island NP White Spruce Trail, 9 May 1984, moose dung and *Sphagnum*, RS Anderson (2, CNCI); Waiparous, 4 Sep 1960, on "toadstools", BF and JL Carr (3, CARR); 3.8 m N Cadomin, 4 Aug 1985, lodgepole pine forest, FIT, RS Anderson (1, CNCI);

Demmitt, 3 km W 90 km NW Grand Prairie, 12 Jun 1984, poplar forest, FIT, S and J Peck (1, CNCI). *British Columbia:* Mt Robson P Park, Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (2, PECK); Barkeyville, 15 Jul 1969, on forest floor, BF and JL Carr (1, CARR). *Manitoba:* Devils Lake 100 km S Grand Rapids, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (1, CNCI); Churchill, 3 Aug 1950, WJ Brown (1, CNCI). *Yukon:* Whitehorse, 4 Sep 1936, SM Williams (1, MCZC); Dempster Hwy km 141 Blackstone River, 6 Jul 1985, dung traps, SA Marshall (21, PECK); Carmacks, 2 Sep 1936, SM Williams (2, MCZC); km 147 Dempster Hwy, Fen Willows-spruce, 1 Jul 1985, dung pan trap, SA Marshall (3, PECK).

UNITED STATES: *Alaska:* Tolovana Rd + Elliot Hwy mi 57, 18 Jul 1985, mushroom trap, SA Marshall (1, PECK); Delta River mi 227 Rich. Hwy., 5 Jul 1958, Lindroth (1, MCZC); Kenai Pen. E Skilak Rd Jct Rt 1, 25 Jun 1984, aspen-spruce forest, malaise FIT, S and J Peck (1, PECK); Circle Hot Springs, 6 Aug 1984, alder-poplar-willow forest litter, S and J Peck (1, PECK); Kenai Pen. Summit Lake, Rt 1, 26 Jun 1984, treeline dwarf willow litter, Berlese, S and J Peck (2, PECK); Denali NP Reily Creek Camp, 10 Aug 1984, 1700', taiga forest, on "mushrooms", Berlese, S and J Peck (4, PECK); Chena Ridge 5 mi W Fairbanks, 27 Jul 1984, alder litter, Berlese, S and J Peck (2, PECK); Tenana, 21 Aug 1936, SM Williams (1, MCZC). *New Hampshire:* Mt Washington, 7 Jul 1899 (1, MCZC); White Mts, subalpine (8, MCZC); White Mts, 4 Jul 1896, subalpine (15, MCZC); Mossiland, 24 Aug 1896 (1, MCZC).

DISCUSSION: The names synonymized here, *A. athabascanum* and *A. alticola*, were erected based in part on purported differences in the shape of the lateral margin of the pronotum. However, we find that the types of each of these fall well within the range of variation of a single species diagnosed from the shape of the median lobe of the aedeagus. *Agathidium athabascanum* comes first in Fall's (1934b) treatment, so we selected it as the valid name.

This is one of the most northerly occurring species in North America. Specimens have been collected from typical northern habitats such as alder, aspen, conifer, and mixed forests, including areas near or north of the tree line. The only host records from label data are "toadstools" and "mushrooms".

Agathidium columbianum Fall

Figures 8, 64, 65, 89

Agathidium columbianum Fall, 1934b: 121; Hatch, 1957.

TYPE MATERIAL: Holotype, ♂ in MCZC labeled "Terrace, B.C. Mrs. M. E. Hippiusley 1932 [number handwritten]/♂/TYPE columbianum [name handwritten, red line under "TYPE"]/M.C.Z. Type 24032 [number handwritten, red label]/H.C. FALL COLLECTION/Agathidium columbianum Fall. [handwritten, red line around border]". Only the single holotype specimen of this species is known.

TYPE LOCALITY: Canada, British Columbia, Terrace.

DIAGNOSIS: This species differs from other members of this group by the concolorous, light brown dorsal surfaces, the anterior clypeal margin convex and extending distinctly, but not greatly, beyond the anterolateral margins of the frons (fig. 8), the mesosternum without a ventrally extending, flattened lobe between the mesocoxae, males without a left mandibular horn, the median lobe of the aedeagus in lateral aspect with the apex pointed and straight (fig. 65), and the operculum rounded without apical emargination (fig. 64). *Agathidium columbianum* is most similar to *A. athabaskanum*, but that species has the apex of the median lobe of the aedeagus sharply pointed and strongly curved dorsad (fig. 65) and the operculum is apically distinctly emarginate (fig. 64).

DESCRIPTION: Body large (TBL = 2.74 mm), robust (PNW/TBL = 0.49), broadly rounded, moderately contractile.

Head, pronotum, and elytra yellow-brown to yellow-red; venter yellow to yellow-brown; antennae and palpi yellow; legs yellow to yellow brown.

Head broad (fig. 8) (MDL/OHW = 0.61), somewhat convex, without transverse, medial crease; tempora short, often forming distinct rim at posterior margin of eye (fig. 8); head finely punctate, punctures sparse, only one size present; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin curved, extending distinctly beyond anterolateral margins of frons (fig. 8); anterior margin of labrum entire; antennomere ratio:

length I:II:III = 1.8:1.0:1.6. Pronotum broad (PNL/PNW = 0.56), laterally not strongly produced, anterior margin not strongly concave, anterolateral angle subquadrate, posterolateral angle distinctive, but rounded; punctation and surface microsculpture similar to those of head. Elytra robust, broad (SEL/ELW = 1.13); coarsely punctate, more dense apically, not in series, with fine irregular microreticulation on surfaces between punctures; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum relatively broad medially (MTL/MTW = 0.34), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; left mandible unmodified in all specimens examined; metafemur very slender, otherwise unmodified; metasternal fovea small, slightly anterad of middle, slightly transverse with small brush of fine, dense setae. Median lobe in lateral aspect robust, with large basal region and subbasal constriction, broad and slightly curved distad of constriction, apical portion long, slender, directed dorsad and nearly straight (fig. 65); in ventral aspect broad, lateral margins subparallel, apical portion broad, slightly acuminate to sharp apex, orifice large (fig. 64); operculum fused to proximal margin of orifice, long, flat, slightly expanded, apex broadly truncate, not emarginate (fig. 64); lateral lobes long, slender, curved basally, apex narrowly rounded with 2 long setae (figs. 64, 65).

Female unknown.

DISTRIBUTION: This species is known only from the type locality in British Columbia (fig. 89).

Agathidium rusticum Fall

Figures 9, 16, 66, 67, 89

Agathidium rusticum Fall, 1934b: 117.

TYPE MATERIAL: Holotype, ♂ in MCZC labeled "N.H./Crawford Notch 9/25/08/TYPE rusticum ["rusticum" handwritten, red line

under "TYPE"]/M.C.Z. Type 24044 [number handwritten, red label]/H.C. FALL COLLECTION".

TYPE LOCALITY: United States, New Hampshire, White Mountains, Crawford Notch.

DIAGNOSIS: This species differs from others in the group by having concolorous dorsal surfaces, the head and pronotum with prominent and distinct microreticulation consisting of fine, impressed lines forming small, isodiametric cells, antennomere VII large, 2 times length of VIII and distinctly wider (fig. 16), the male metasternal fovea large, transverse, located slightly anterad of middle, the median lobe relatively straight in lateral aspect, with small basal portion, the apex sharply pointed and strongly curved dorsad (fig. 67). The female has 4-4-4 tarsi.

DESCRIPTION: Body relatively small (TBL = 2.48–2.82 mm), robust (PNW/TBL = 0.45–0.52), laterally broadly rounded, moderately contractile.

Head red to dark red with large paler area medially, clypeus yellow; pronotum light red; elytra red to dark red; venter yellow to dark red; basal antennomeres red-yellow, club antennomeres brown; palpi yellow; legs yellow to yellow-red.

Head broad (fig. 9) (MDL/OHW = 0.55–0.60), flattened, often with prominent transverse, medial crease; temporum very short, often forming distinct rim at posterior margin of eye; head finely punctate, with microsculpture of fine cells on surfaces between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin moderately excavate (fig. 9); anterior margin of labrum entire; antennomere ratios: length I:II:III = 1.6:1.0:1.3, width VII:VIII:IX = 1.3:1.0:1.5. Pronotum broad (PNL/PNW = 0.61–0.65) (fig. 16), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, but rounded; punctuation and surface microsculpture similar to those of head. Elytra robust (SEL/ELW = 0.87–1.12); punctuation coarser than pronotum, but sparse, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae,

anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum relatively narrow medially (MTL/MTW = 0.19–0.24), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with small ventral field of spatulate setae; mandibular horn absent on most specimens, one specimen with left mandible thickened and extending up and slightly over right mandible; metafemur moderately slender, unmodified; metasternal fovea large, transversely linear and slightly curved, located slightly anterad of middle, smaller and rounded on some specimens. Median lobe in lateral aspect slender, evenly curved from base, basal portion not large, apical portion narrowed, apex slender and curved dorsad, pointed, in some specimens more distinctly hooked (fig. 67); in ventral aspect slender, lateral margins subparallel, apical portion with lateral margins slightly sinuate, convergent to narrowly rounded apex (fig. 66); operculum divided into two short, parallel, flat, truncate rami (fig. 66); lateral lobes long, slender, evenly curved, apices narrowly rounded with 2 long, stout setae (figs. 66, 67).

Female tarsi 4-4-4.

DISTRIBUTION: This species is known from northeastern North America (fig. 89).

SPECIMENS EXAMINED: CANADA: *Ontario*: Chaffeys Locks QUBS, 7 Sep 1980, forest, malaise FIT, S Peck (2, CNCI).

UNITED STATES: *New Hampshire*: White Mts SUBALPINE (1, MCZC). *New York*: Slide Mt, 3 Jun 1941, W Spector (1, CASC).

DISCUSSION: The antennae in this species approach the state found in many other non-*Agathidium* Agathidiini where antennomere VII is distinctly longer and wider than VIII. However, in other respects, such as a distinctive temporum and postocular carina and excavate anterior clypeal margin, the species resembles other *A. pulchrum* group members.

Agathidium repentinum Horn
Figures 10, 47, 68, 69, 90

Agathidium repentinum Horn, 1880: 304; Leng, 1920; Fall, 1934b.

TYPE MATERIAL: Holotype, ♀ in MCZC la-

beled "Wt Mts N. H. Woods/HOLOTYPE 3024 [number handwritten, red label]/A. repentinum Horn [handwritten]". Horn had a single specimen when he described this species and it is a holotype by monotypy.

TYPE LOCALITY: United States, New Hampshire, White Mountains.

DIAGNOSIS: This species differs from others in the group by having concolorous dorsal surfaces, the head and pronotum prominently and distinctly microreticulate, antennomere VII similar in size to VIII, the male metasternal fovea round, located slightly posterad of middle, the median lobe relatively strongly curved basally, with a very large basal portion, the apex sharply pointed, long, and straight (fig. 69), the male left mandibular horn, when present, consisting of a flattened, spine-like process extending posterad over the clypeus. The female has 4-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 2.67–2.85 mm), rotund (PNW/TBL = 0.44), laterally broadly rounded, moderately contractile.

Head, pronotum, and elytra dark red; venter dark red-brown to yellow-red; antennae yellow basally, apical 5 antennomeres brown; palpi yellow-brown; legs yellow-red.

Head broad (fig. 10) (MDL/OHW = 0.59–0.66), dorsally flattened, without transverse crease; temporum short, forming distinct rim at posterior margin of eye (fig. 10); head finely and moderately densely punctate, surfaces between punctures with conspicuous microreticulation of fine, isodiametric cells; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin slightly excavate, extending nearly to anterolateral margins of frons (fig. 10); labrum entire; antennomere ratios: length I:II:III = 2.1:1.0:1.2, width VII:VIII:IX = 1.0:1.0:1.8. Pronotum broad (PNL/PNW = 0.63–0.65), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, similar in form to anterolateral angle; punctation similar to that of head, with similar microreticulation. Elytra very broad and robust, lateral margins rounded (SEL/ELW = 1.21–1.32); punctation slightly more coarse than on pronotum, but sparse, surface between punctures shiny and smooth; sutural stria about one-half length of elytron. Mesosternum strongly concave posteriorly,

without prominent lobe extending ventrally between mesocoxae, anterior portion much shorter than posterior portion; medial longitudinal carina absent on anterior portion. Metasternum moderately broad medially (MTL/MTW = 0.29–0.31), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with moderately large ventral field of spatulate setae; left mandibular horn when fully developed short, flattened, spinous, extending posteriorly over clypeus in adpressed fashion, without apical fovea, many specimens unmodified; metafemur moderately slender, unmodified; metasternal fovea submedial, moderately large, transversely slightly oval, with large brush of fine, dense setae. Median lobe in lateral aspect with large, robust basal portion and submedial constriction, slightly curved distal to constriction, moderately robust, apical portion long, straight, slender, tapering to long slender point (fig. 69); in ventral aspect moderately slender, lateral margins tapering gradually to broadly pointed apex (fig. 68); operculum a broad, rounded, hyaline lobe (fig. 68); lateral lobes slender, curved basally, apically narrowly rounded and each with 2 long, stout setae (figs. 68, 69).

Female tarsi 4-4-4.

DISTRIBUTION: This is a northern species collected from Alaska east to New Hampshire (fig. 90).

SPECIMENS EXAMINED: CANADA: *Alberta*: TP25Rg3 W5 mer, 14 Nov 1973, B and J Carr (1, CARR). *Manitoba*: Churchill, 15 Jun 1937, WJ Brown (2, CNCI). *Yukon*: Dempster Hwy, km 141 Blackstone River, 6 Jul 1985, mushroom traps in *Sphagnum*, SA Marshall (1, PECK).

UNITED STATES: *Alaska*: Denali NP, Reily Creek Camp, 10 Aug 1984, 1700', winter moose dung, taiga-willow forest, Berlese, S and J Peck (1, PECK); Nenana, 11 Aug 1984, riverside poplar forest litter, Berlese, S and J Peck (15, PECK). *New Hampshire*: Hermit Lake, White Mts, 6 Aug 1906, S Martin (1, MCZC); Subalpine, White Mts, 30 Jun 1896 (2, MCZC); Coos Co.: 1 mi NE East Inlet Dam, 26 Nov 1986, conifer leaf litter, DS Chandler (3, CNCI).

DISCUSSION: *Agathidium repentinum* was described from a single female specimen. However, we are confident assigning male specimens to the species based on the pres-

ence of prominent microreticulation on especially the head and pronotum. The species is relatively rarely collected but is widespread across the northern latitudes. It has been collected from conifer and poplar forests and "taiga-willow forest". A single elevation record is from 1700 ft.

Agathidium marae Miller and Wheeler,
new species

Figures 23, 24, 70, 71, 91

TYPE MATERIAL: Holotype, ♂ in WSUC labeled "WASHINGTON: Mt. Spokane SP, nr Bald Knob Cmpgr. Spokane Co., 5200 ft. W. J. Turner 28-VI-1977 Malaise trap/HOLOTYPIC *Agathidium marae* Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: United States, Washington, Spokane Co., Mt Spokane State Park, near Bald Knob Campground, 5200'.

DIAGNOSIS: This species differs from others in the group by having concolorous dark red-brown elytra, no microreticulation on the head and pronotum, the anterior clypeal margin very strongly excavated (fig. 24), and the tempora forming a very abrupt, prominent rim at the posterior margin of the eye (fig. 24). Also, many males have a prominent left mandibular horn and a variously developed right frontal horn (figs. 23, 24). These horns are highly variable in development, but the right frontal horn is only well developed when the mandibular horn is also well developed. The median lobe of the aedeagus in lateral aspect is slender and elongate with a small basal portion and relatively simple apex (fig. 71). The lateral lobes are broadly fused dorsally for about one-third length of the median lobe of the aedeagus (figs. 70, 71). Females have 5-4-4 tarsomeres.

DESCRIPTION: Body moderately large (TBL = 2.52–2.67 mm), rotund (PNW/TBL = 0.43–0.45), laterally broadly rounded, strongly contractile.

Head dark red-brown with indistinct red medial macula; pronotum, elytra, and venter dark red-brown; antennae, palpi, and legs yellow-red.

Head broad (fig. 24) (MDL/OHW = 0.64–0.66), dorsally flat, often with indistinct, transverse, medial crease; tempora short,

forming rim at posterior margin of eye (fig. 24); head finely punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin strongly excavate (fig. 24); labrum anteromedially entire; antennomere ratios: length I:II:III = 2.2:1.0:1.6, width VII:VIII:IX = 0.9:1.0:1.9. Pronotum broad (PNL/PNW = 0.59–0.61), laterally not strongly produced, lateral margins moderately broad, anterolateral angle subquadrate, posterolateral angle distinctive, but more rounded than anterolateral angle; punctation similar to that of head. Elytra moderately elongate (SEL/ELW = 0.99–1.00); lateral margins broadly rounded; punctation coarser than pronotum, surface between punctures shiny and smooth, some punctures in indistinct series; sutural stria about one-half length of elytron. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae, anterior portion much less than one-half length of posterior portion; medial longitudinal carina obsolete on anterior portion. Metasternum broad medially (MTL/MTW = 0.30–0.31), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with large ventral field of spatulate setae; mandibular horn, when present, very long, curving posteriorly over front of head, slightly flattened in cross-section, punctate and setose along its length, with very prominent apical fovea (figs. 23, 24) and very large series of fine, dense setae; frons with long, straight, pointed horn extending upward from surface at right of clypeus, apex reaching to near apex of mandibular horn (figs. 23, 24), some specimens with only a small prominence in this position, some specimens with no frontal horn or prominence but with mandibular horn, some specimens with no horns whatsoever; metafemur slender, unmodified; metasternal fovea anterior, large, transverse, curved, with large series of fine, dense setae. Median lobe in lateral aspect elongate, slender, with small basal portion, curved basally, apical portion short, slender, slightly curved dorsad, apex narrowly rounded (fig. 71); in ventral aspect slender, lateral margins subparallel, slightly convergent in apical half,

apical portion broadly triangular, apex narrowly rounded (fig. 70); operculum reduced to an inconspicuous, short, flattened structure that is apically bilobed (fig. 70); lateral lobes long, broadly fused along dorsal margin for about one-third length of median lobe, apices narrowly rounded, each with 2 long, stout setae (figs. 70, 71).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named in honor of Darlene Marie Platt, significant other of the junior author, for her encouragement and support.

DISTRIBUTION: This species is known from the Pacific Northwest east to Montana (fig. 91).

PARATYPES: CANADA: *British Columbia*: 5.6 mi E E Border Glacier NP on #1, 11 May 1984, FIT, RS Anderson (10, CNCI); Prospect Creek W Merritt, 27 Jun 1984 (1, QDWC).

UNITED STATES: *Oregon*: Clackamas Co.: 1.5 mi S Jct US 26 Ore 35, 11 Jul 1975, 3500', conifer forest, Berlese, A Newton, M Thayer (8, MCZC); Mt Hood NF, Still Creek Cpgd, 10 Jul 1975, 3700', litter, mixed conifer forest, Berlese, A Newton (2, MCZC).

DISCUSSION: The unusual horn arising from the right side of the frons of some male specimens (figs. 23, 24) is particularly unique to this species. Behavioral correlates of this particular morphology have not been observed. This species has been collected in conifer forests. Altitude records from label data are from 3500 to 5200 ft.

Agathidium rotundulum Mannerheim
Figures 11, 72, 73, 91

Agathidium rotundulum Mannerheim, 1852: 370; Horn, 1880; Leng, 1920; Fall, 1934b.
Agathidium kincaidi Hatch, 1936: 39; 1957 (synonymized with *A. rotundulum*).

TYPE MATERIAL: *Agathidium rotundulum*: Lectotype (designated here to fix this name with the species), ♂ in MCZC labeled "95/Type 7945 [red label]/A rotundulum Sitkha Mannh. [handwritten]".

Agathidium kincaidi: holotype, ♀ in USNM labeled "Loveland, Wash. April 8, 1913/TYPE ♂ *Agathidium* (*Neoceble*) *kincaidi* 1935—M.H. Hatch [handwritten, red label]".

TYPE LOCALITY: *Agathidium rotundulum*:

United States, Alaska. *Agathidium kincaidi*: United States, Washington, Loveland.

DIAGNOSIS: This species differs from other members of the group by its small size (TBL < 2.2 mm), concolorous elytra, the anterior clypeal margin extending approximately to level of anterolateral margins of frons, antennomere II subequal in length to III, the male metasternal fovea absent, the male left mandibular horn absent, the median lobe of the aedeagus in lateral aspect with a very large basal portion and the apical portion moderately long, straight, and apically slightly expanded and rounded (fig. 73). The female tarsi are 4-4-4.

DESCRIPTION: Body small (TBL = 1.78–2.12 mm), rotund (PNW/TBL = 0.50–0.52), laterally broadly rounded, moderately strongly contractile.

Head piceous, clypeus red; pronotum red-brown, yellow along margins; elytra red-brown; venter dark red-brown to yellow-red; antennae and palpi yellow-brown; legs yellow-red.

Head broad (MDL/OHW = 0.65), dorsally flattened, with prominent medial crease; temporum very short, inconspicuous; head finely and sparsely punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin very slightly excavate, extending about to level of anterolateral margins of frons (fig. 11); labrum entire; antennomere ratios: length I:II:III = 1.3:1.0:0.8, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum broad (PNL/PNW = 0.57–0.62), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, somewhat rounded; punctation similar to that of head, very fine and sparse. Elytra broad and robust, lateral margins rounded (SEL/ELW = 0.88–0.98); punctation slightly more coarse than on pronotum, but sparse, surface between punctures shiny and smooth; sutural stria absent. Mesosternum moderately concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion shorter than posterior portion; medial longitudinal carina absent on anterior portion. Metasternum moderately narrow medially (MTL/MTW = 0.22), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with moderately large ventral field of spatulate setae; left mandible not modified; metafemur moderately slender, unmodified; metasternal fovea absent. Median lobe in lateral aspect with large, robust basal portion and submedial constriction, relatively straight distal to constriction, apical portion moderately long, straight, apically slightly expanded and rounded (fig. 73); in ventral aspect slender lateral margins subparallel, apical portion elongate-triangular, apex narrowly rounded (fig. 72); operculum broad, short, flat, apically broadly rounded (fig. 72); lateral lobes moderately broad basally, slightly curved, apically narrowly rounded and with 2 long, stout setae (figs. 72, 73).

Female tarsi 4-4-4.

DISTRIBUTION: This species occurs along the west coast of North America from Alaska south to northern California (fig. 91).

SPECIMENS EXAMINED: CANADA: *Alberta*: 11 mi NE Robb, 4 Aug 1985, lodgepole pine forest, FIT, RS Anderson (1, CNCI). *British Columbia*: Queen Charlotte Island (1, CASC); Monashee Mtn nr Cherryville, 10 Aug 1982, 1400–1600 m, M Sorensson (1, LUND); Toco, 28 Apr 1984, R and J Camenisch (2, CNCI); Charlotte Islands, Graham Island, 1 mi NW Tiell, 27 Jun 1984, Sitka spruce, hemlock forest, RS Anderson (15, CNCI); Vancouver (5, MCZC); Queen Charlotte Island (1, MCZC); Massett, Graham Island, moss, Clark (1, MCZC); Vancouver Island (2, MCZC).

UNITED STATES: *Alaska*: Seward, 26 Jun 1984, mature poplar-spruce, malaise-FIT, S and J Peck (1, PECK). *California*: Santa Cruz Mts (1, MCZC); Amador Co.: 1 mi W Pine Grove, 24 Jun 1975, leaf litter, mixed hardwood conifer forest, A Newton, M Thayer (1, MCZC); Del Norte Co.: Crescent City, 1 Mar 1978, pine duff, Berlese, TR Haig (12, FGAC); Humboldt Co.: Kneeland, 9 Jan 1980, redwood duff, Berlese, TR Haig (3, FGAC); Blue Lake, 21 Oct 1977, redwood duff, Berlese, TR Haig (16, FGAC); Orick, 29 Oct 1976, redwood duff, Berlese, TR Haig (25, FGAC). *Oregon*: Linn Co.: 32.5 mi S Sweet Home, 20 Oct 1967, *Abies*, spruce, pine, hemlock duff, Malcolm (1, CUIC). *Washington*: Jefferson Co.: 20 km NE Kalaloch, 1 Sep 1982, M Sorensson (4, LUND).

DISCUSSION: *Agathidium rotundulum* and *A. kincaidi* are synonyms based on our examination of the type specimens and following Hatch (1957).

This species has been collected from various forest habitats including redwood, lodgepole pine, poplar-spruce, Sitka spruce-hemlock, etc. Altitude records are from 1400 to 1600 m.

Agathidium aristerium Wheeler
Figures 25, 26, 74, 75, 91

Agathidium aristerium Wheeler, 1987: 399; 1990 (description of larva).

TYPE MATERIAL: Holotype, ♂ in CUIC (see Wheeler, 1987).

TYPE LOCALITY: United States, New York, Tompkins County, Smith Woods, Trumansburg.

DIAGNOSIS: This species is characterized by the dorsally red, shiny coloration without maculae or microreticulation, the anterior clypeal margin strongly excavate (fig. 26), the head narrowed immediately posterad of the compound eye without a posterior ocular rim (fig. 26), the male with a metasternal fovea located medially along the midline of the metasternum, the male mandibular horn, when present, formed by extension of the apex of the mandible in a long, dorsally curved, flattened structure (figs. 25, 26), and the median lobe in lateral aspect slender, evenly and shallowly curved (fig. 75) and in ventral aspect with apex expanded and broadly pointed (fig. 74). Females have 4-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 2.33–2.68 mm), robust, broadly rounded (PNW/TBL = 0.44–0.46), moderately contractile.

Head dark red; pronotum and elytra red to dark red; venter red-yellow; basal antennomeres red-brown, club antennomeres red-yellow; palpi brown; legs red-yellow.

Head broad (fig. 26) (MDL/OHW = 0.61–0.64), broadly convex, without transverse, medial crease; temporum short, inconspicuous (fig. 26); head finely and sparsely punctate, surface between punctures shiny; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin strongly excavate (fig. 26); anterior margin of labrum slightly concave; antennomere ratios: length I:II:III = 1.4:1.0:1.1, width VII:VIII:IX = 1.1:1.0:2.6. Pronotum broad (PNL/PNW = 0.63–0.72), lateral margin rel-

atively short, not strongly produced, posterolateral angle more angulate than anterolateral angle; punctation similar to that of head. Elytra broad, robust (SEL/ELW = 1.06–1.21); punctation fine and sparse; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum broad medially (MTL/MTW = 0.20–0.22), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with moderately large ventral field of spatulate setae; mandibular horn, when fully developed, formed by apex of mandible extending in broad, flat, sweeping curve dorsad and to the right over the right mandible (figs. 25, 26), finely setose but without prominent setose fovea, some specimens with mandible variously thickened, others without modification; metafemur moderately broad, unmodified; metasternal fovea small, round, medial, with small brush of fine, dense setae. Median lobe in lateral aspect slender, slightly curved basally, apical portion short, directed slightly dorsad, narrowly rounded (fig. 75); in ventral aspect slender, lateral margins subparallel, apical portion broad, apex abruptly, but evenly, narrowed to broadly pointed apex (fig. 74); operculum an inconspicuous, broad flat lobe (fig. 74); lateral lobes slender, curved basally, apically narrowly rounded with 2 long setae (figs. 74, 75).

Female tarsi 4-4-4.

DISTRIBUTION: This species is known from northeastern North America (fig. 91).

SPECIMENS EXAMINED: CANADA: *Manitoba*: Rennie Lily Pond Whiteshell Prov. Park, 6 Jun 1984, maple poplar forest, FIT, S and J Peck (2, CNCI); Rennie, Lily Pond Whiteshell Prov. Park, 6 Jun 1984, maple, poplar forest, FIT, S and J Peck (13, PECK). *Ontario*: Chaffeys Locks QUBS, 21 Sep 1980, malaise-FIT, S Peck (1, CUIC); Markham, 24 May 1980, deciduous forest, RS Anderson (1, CNCI); 25 km W Ignace, 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (1, CNCI); Hackston, 20 km SE Kemptville, 24 Jun 1984, FIT, M Kaulbars (5, PECK); Shirleys Bay 15 km W Ottawa, 15 May

1984, M Kaulbars (3, PECK); Ottawa, Stittsville, 10 Jul 1977, M Sanbourne (1, CNCI). *Quebec*: Hull, Gatineau Park nr Pinks Lake, 8 Aug 1979, S Peck, A Davies (1, PECK); Hull, Gatineau Park nr Pinks Lake, 13 Apr 1980, malaise (2, CUIC).

UNITED STATES: *Illinois*: Union Co.: Pine Hills Field Station, 15 May 1967, rotten log, Berlese, JM Campbell (3, CNCI). *Michigan*: Kalamazoo Co.: Hickory Corners, Gull Lake, 11 Jun 1981, FIT, RS Anderson (10, CNCI); Hickory Corners, Gull Lake, 11 Jun 1981, FIT, R Anderson (3, CNCI). *New Hampshire*: Carroll Co.: The Bowl, 2.5 mi NW Wonalancet, 5 Jun 1985, FIT, DS Chandler (5, CNCI); Coos Co.: Norton Pool, 3 mi NE East Inlet Dam, 25 Jul 1986, FIT, DS Chandler (3, CNCI). *New York*: Tompkins Co.: Trumansburg, Smith Woods, 6 Aug 1986, on *Physarum polycephalum* plasmodium on *Pleurotus* fruiting body, QD Wheeler (20, MCZC). *Ohio*: Fairfield Co.: 13 Sep, DJ and JL Knull (22, OSUC).

DISCUSSION: *Agathidium aristerium* has been collected from May to September. Specimens have been found in deciduous and fir forests. A single host record is from a *Physarum polycephalum* plasmodium on *Pleurotus* fruiting body (see Wheeler, 1987). All instars of the larva were described by Wheeler (1990).

Agathidium atronitens Fall
Figures 27, 28, 76, 77, 92

Agathidium atronitens Fall, 1934b: 122.

TYPE MATERIAL: Holotype, ♀ in MCZC labeled "Urbana ILL 4/20/25/♀/TYPE atronitens [name handwritten, red line under "TYPE"]/M.C.Z. Type 24029 [number handwritten, red label]/H.C. FALL COLLECTION".

TYPE LOCALITY: United States, Illinois, Urbana.

DIAGNOSIS: This species is distinguished from others in the group by the concolorous, dark red dorsal surfaces which lack microreticulation, the head narrowed immediately behind eye and without postocular rim (figs. 27, 28), anterior clypeal margin strongly excavated (fig. 28), the male metasternal fovea located medially along the midline of the metasternum, the male mandibular horn straight, extending from middle of mandible in oblique angle to right over the right mandible (figs. 27, 28), and the median lobe in lateral aspect robust, with large basal portion and

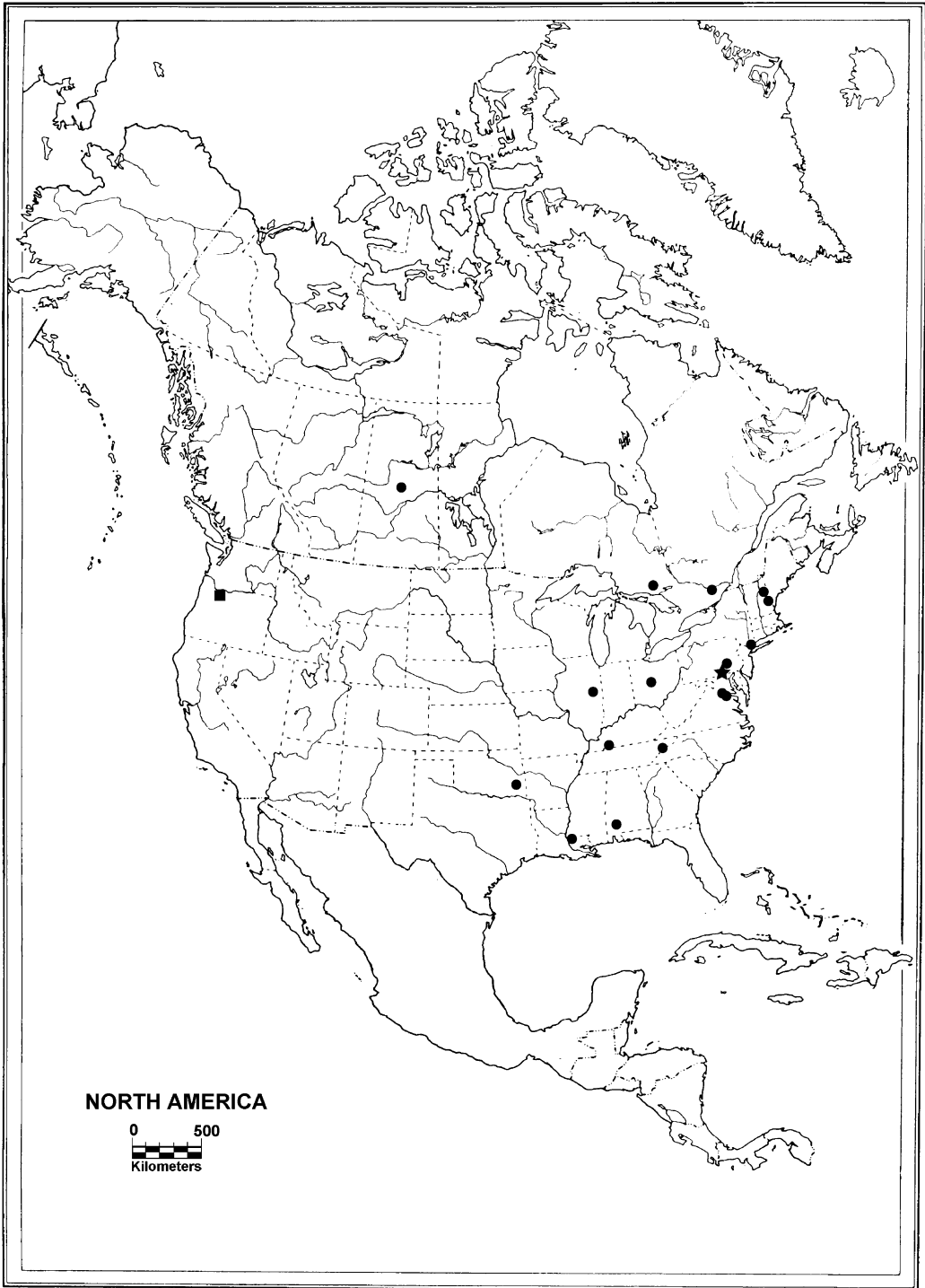


Fig. 92. Geographic distribution of *Agathidium pulchrum*-group species: *A. atronitens* = ●; *A. oregonense* = ■; *A. politum* = ★.

submedial constriction and with small apical spine (fig. 77). Females have 4-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 3.15–3.21 mm), robust (PNW/TBL = 0.48–0.50), broadly rounded, moderately contractile.

Head dark red; pronotum and elytra red to dark red; venter red to red-yellow; basal antennomeres red-brown, club antennomeres brown; palpi red; legs red to red-yellow.

Head broad (fig. 28) (MDL/OHW = 0.51–0.60), flattened, often with prominent transverse, medial crease; tempora very short, without rim at posterior margin of eye (fig. 28); head finely punctate, with microsculpture of fine cells on surfaces between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin strongly excavate (fig. 28); anterior margin of labrum entire; antennomere ratios: length I:II:III = 1.6:1.0:1.0, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum broad (PNL/PNW = 0.55–0.61), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, but rounded; punctation and surface microsculpture similar to those of head. Elytra robust (SEL/ELW = 1.00); nearly impunctate to finely and sparsely punctate, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion less than one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum relatively short medially (MTL/MTW = 0.21–0.24), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; mandibular horn highly variable in length, straight, extending from middle of mandible in oblique angle to right over right mandible (figs. 27, 28), setose, apically pointed, with small, indistinct setose fovea near pointed apex; metafemur moderately broad, unmodified; metasternal fovea medial, transversely slightly ovoid, with large brush of fine, dense setae. Median lobe in lateral aspect robust, basal portion extremely large and robust, with dis-

tinct submedial constriction, straight and short distad of constriction, apical portion short, stout, directed slightly dorsad, apically narrowly rounded (fig. 77); in ventral aspect robust, lateral margins subparallel, apical portion broad, apex broadly pointed (fig. 76); operculum broad, flat, apically narrowly emarginate, hyaline and indistinct (fig. 76); lateral lobes slender, curved basally, apically narrowly round with 2 long, stout setae (figs. 76, 77).

Female tarsi 4-4-4.

DISTRIBUTION: This species is found in eastern North America from Saskatchewan and New Hampshire south through Oklahoma to Louisiana and Alabama and east to Washington, DC (fig. 92).

SPECIMENS EXAMINED: CANADA: *Ontario*: Sudbury, Laurentian Univ., 26 May 1982, FIT, R DeClerck (1, CNCI); Alfred Bog, Alfred, 13 Aug 1984, M Sanborne (1, CNCI). *Saskatchewan*: Prince Albert NP 16 km W Christopher, 9 Jun 1984, fir-aspens forest, FIT, S and J Peck (2, CNCI).

UNITED STATES: *Alabama*: Monroe Co.: Big Flat Creek 31°36'30"N, 87°24'53"W, 27 May 1995, upland decid, Berlese, CE Carlton (1, LSAM). *District of Columbia*: paratype (1, MCZC). *Kentucky*: 5 mi W Hopkinsville, 22 Sep 1967, deciduous duff, Berlese, JM Campbell (2, CNCI). *Louisiana*: W Feliciana Co.: 6 mi ESE St Francisville, 17 May 1995, forest litter, D Colby, D Landau (1, LSAM); Cabin Area 30°47'N, 91°15'W, 1 Dec 2000, fallen logs, FIT, AR Cline (5, LSAM); Tunica WMA 30°55'N, 91°30'W, 28 Nov 1998, FIT, C Carlton, J Johnson, A Tsichechkin (3, LSAM). *New Hampshire*: Grafton Co.: Hubbard Brook Exp. Sta., Bear Brook, 6 Jul 1983, rotten wood, DS Chandler (5, DENH); Straf. Co.: 1 mi SW Durham, 27 Jun 1987, FIT, DS Chandler (1, CNCI). *New York*: Westchester Co.: Calder Ecology Center, Armonk, 24 Apr 1979, Berlese, K Schmidt (16, AMNH); Calder Ecology Center, Armonk, 24 Apr 1979, Berlese, K Schmidt (4, AMNH). *Ohio*: Franklin Co.: Columbus, 13 Sep 1975, QD Wheeler (4, QDWC); Columbus, 13 Sep 1975, QD Wheeler (2, QDWC). *Oklahoma*: Latimer Co.: 5 mi W Red Oak, Dec 1980, K Stephan (2, QDWC); K Stephan (2, QDWC). *Pennsylvania*: Lebanon Co.: 1 mi E Indian Town Gap, 13 Jul 1969, Berlese, W Michmore (1, CNCI). *Tennessee*: Sevier Co.: Appalachian Trail at Beech Gap on Clingmans Dome Rd 83°26'50"W, 35°36'36"N, 28 Jun 2001, 1750', forest litter, Berlese, C Carlton, A Tsichechkin, V Mosely (5,

LSAM). *Virginia*: Alexandria, 4 Apr 1971, on *Polyporus versicolor*, J Powell (8, EMEC).

DISCUSSION: This species has been collected from deciduous and fir forests. A single altitude record is from 1750 ft (Tennessee). A single host record is from *Polyporus versicolor*.

Agathidium oregonense Miller and
Wheeler, new species
Figures 13, 78, 79, 92

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "ORE: Clackamas Co. 8500', 10 mi N, 10 mi E Govt. Camp, Mt. Hood rd. 5-31, 30.viii.72 [handwritten]/E. Benedict EB-789 hemlock litter [handwritten]/HOLOTYPE *Agathidium oregonense* Miller and Wheeler, 2003 [red label with black line border]". Only a single specimen of this species was examined.

TYPE LOCALITY: United States, Oregon, Clackamas County, 10 mi north, 10 mi east of Government Camp, Mt Hood Road.

DIAGNOSIS: This species differs from other members of the group by the concolorous elytra, the lack of microreticulation on the dorsal surfaces, the moderately excavated anterior clypeal margin (fig. 13), the head narrowed immediately posterior of eyes and without a prominent postocular rim (fig. 13), the male metasternal fovea located distinctly anterad of the middle of the metasternum, and the male lateral lobe apically abruptly expanded and obliquely truncate (fig. 79). The median lobe of the aedeagus in lateral aspect is robust with the apex slender, straight, and sharply pointed (fig. 79). The single male specimen examined lacks a mandibular horn.

DESCRIPTION: Body moderately large (TBL = 2.39 mm), rotund (PNW/TBL = 0.46), laterally broadly rounded, strongly contractile.

Head yellow-red with indistinct paler medial macula; pronotum and elytra yellow-red; sterna red-yellow; antennae, palpi, and legs yellow-red; legs yellow-red.

Head moderately broad (fig. 13) (MDL/OHW = 0.67), dorsally flat, without transverse, medial crease; tempora short, forming rim at posterior margin of eye (fig. 13); head finely and moderately coarsely punctate, surfaces shiny and smooth between

punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin moderately excavate (fig. 13); labrum anteromedially entire; antennomere ratios: length I:II:III = 2.2:1.0:1.8, width VII:VIII:IX = 1.0:1.0:1.4. Pronotum broad (PNL/PNW = 0.58), laterally not strongly produced, lateral margins moderately broad, anterolateral angle subquadrate, posterolateral angle distinctive, but more rounded than anterolateral angle; punctation similar to that of head, more sparse. Elytra moderately elongate, lateral margins broadly rounded (SEL/ELW = 1.09); punctation somewhat coarser than pronotum, surface between punctures shiny and smooth, some punctures in vague series; sutural stria about one-half length of elytron. Mesosternum strongly concave posteriorly, with prominent lobe extending ventrally between mesocoxae, anterior portion much less than one-half length of posterior portion; medial longitudinal carina obsolete on anterior portion. Metasternum broad medially (MTL/MTW = 0.32), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with large ventral field of spatulate setae; mandibular horn absent in single specimen examined; metafemur slender, unmodified; metasternal fovea anterior, minute, with small pencil of fine, dense setae. Median lobe in lateral aspect with relatively robust basal portion and submedial constriction, curved, robust distal to constriction, apical portion directed somewhat dorsad, straight, tapered to long, slender point (fig. 79); in ventral aspect moderately broad, lateral margins subparallel, with moderately distinct constriction near base of apical portion which is broadly triangular, apex pointed, orifice large (fig. 78); operculum a broad, rounded, flat lobe (fig. 78); lateral lobes moderately long, slender to apex which is broadly expanded and obliquely truncate, spatulate, with two long, stout setae (figs. 78, 79).

Female unknown.

ETYMOLOGY: This species is named for the state in which the type specimen was collected.

DISTRIBUTION: This species is known only from the type locality in Oregon (fig. 92).

DISCUSSION: The holotype specimen was collected from hemlock litter at 6500 ft elevation.

Agathidium picipes Fall
Figures 29, 30, 80, 81, 93

Agathidium picipes Fall, 1934b: 130.

Agathidium contiguum Fall, 1934b: 119. NEW SYNONYM.

Agathidium contiguum var. *varipunctatum* Hatch, 1936: 40. NEW SYNONYM.

Agathidium striolum Hatch, 1957: 33. NEW SYNONYM.

TYPE MATERIAL: *Agathidium picipes*: holotype, ♂ in MCZC labeled "Santa Cruz Co. VI-96 CAL./♂/TYPE picipes [name handwritten, red line under "TYPE"]/M.C.Z. Type 24042 [number handwritten, red label]/H.C. FALL COLLECTION".

Agathidium contiguum: Holotype, ♂ in MCZC labeled "W.T./♂/TYPE contiguum ["contiguum" handwritten, red line under "TYPE"]/M.C.Z. Type 24034 [number handwritten, red label]/H.C. FALL COLLECTION".

Agathidium varipunctatum: holotype, ♂ in USNM labeled "Seattle, WASH IV-13 1931 M.H. Hatch [date handwritten]/TYPE ♂ *Agathidium* (*Neoceble*) *varipunctatum* 1935—M.H. Hatch [handwritten, red label]".

Agathidium striolum: holotype, ♂ in USNM labeled "Seattle, WASH V-9 1941 Lewis [date and "Lewis" handwritten]/TYPE ♂ *Agathidium* (*Cyphocele*) *striolum* 1953—M.H. Hatch [handwritten, red label]".

TYPE LOCALITY: *Agathidium picipes*: United States, California, Santa Cruz Co.

Agathidium varipunctatum: United States, Washington, Seattle. *Agathidium contiguum*: "W.T." [probably United States, Washington State]. *Agathidium striolum*: United States, Washington, Seattle.

DIAGNOSIS: This species differs from others in the group by concolorous dorsal surfaces, lack of microreticulation, the male metasternal fovea located distinctly anterad of the middle of the metasternum and the median lobe of the aedeagus prominently bent medially in lateral aspect (fig. 81). The male mandibular horn, when fully formed, is represented by a short, flattened spine extending posterad over the clypeus (figs. 29, 30). The female tarsi are 5-4-4.

resented by a short, flattened spine extending posterad over the clypeus (figs. 29, 30). The female tarsi are 5-4-4.

DESCRIPTION: Body moderately large (TBL = 2.58–2.86 mm), somewhat elongate (PNW/TBL = 0.43–0.47), moderately contractile.

Head piceous with dark red, diffuse medial macula; pronotum dark red to piceous, with lighter margins; elytron and venter dark red-brown to piceous; antennae and palpi dark red-brown to piceous; legs dark red.

Head broad (fig. 30) (MDL/OHW = 0.58–0.64), flattened, often with moderately prominent transverse, medial crease; tempora moderately prominent (fig. 30); head finely and sparsely punctate, smooth and shiny on surface between punctures; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin strongly excavate (fig. 30); anterior margin of labrum entire; antennomere ratios: length I:II:III = 2.1:1.0:1.3, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum broad (PNL/PNW = 0.54–0.61), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle relatively strongly angulate; punctation and surface microsculpture similar to those of head. Elytra very broad (SEL/ELW = 1.21–1.25); punctation more coarse and dense than on pronotum, punctures in two sizes, many specimens with some coarser punctures forming longitudinal series, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina reduced on anterior portion. Metasternum very broad medially (MTL/MTW = 0.34–0.40), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; mandibular horn, when fully developed, relatively short, spinelike, flattened and adpressed, setose, extending posteriorly over surface of clypeus, apex sharply pointed (figs. 29, 30), setose fovea not on horn, instead on mandible between horn and apex of mandible; metafemur

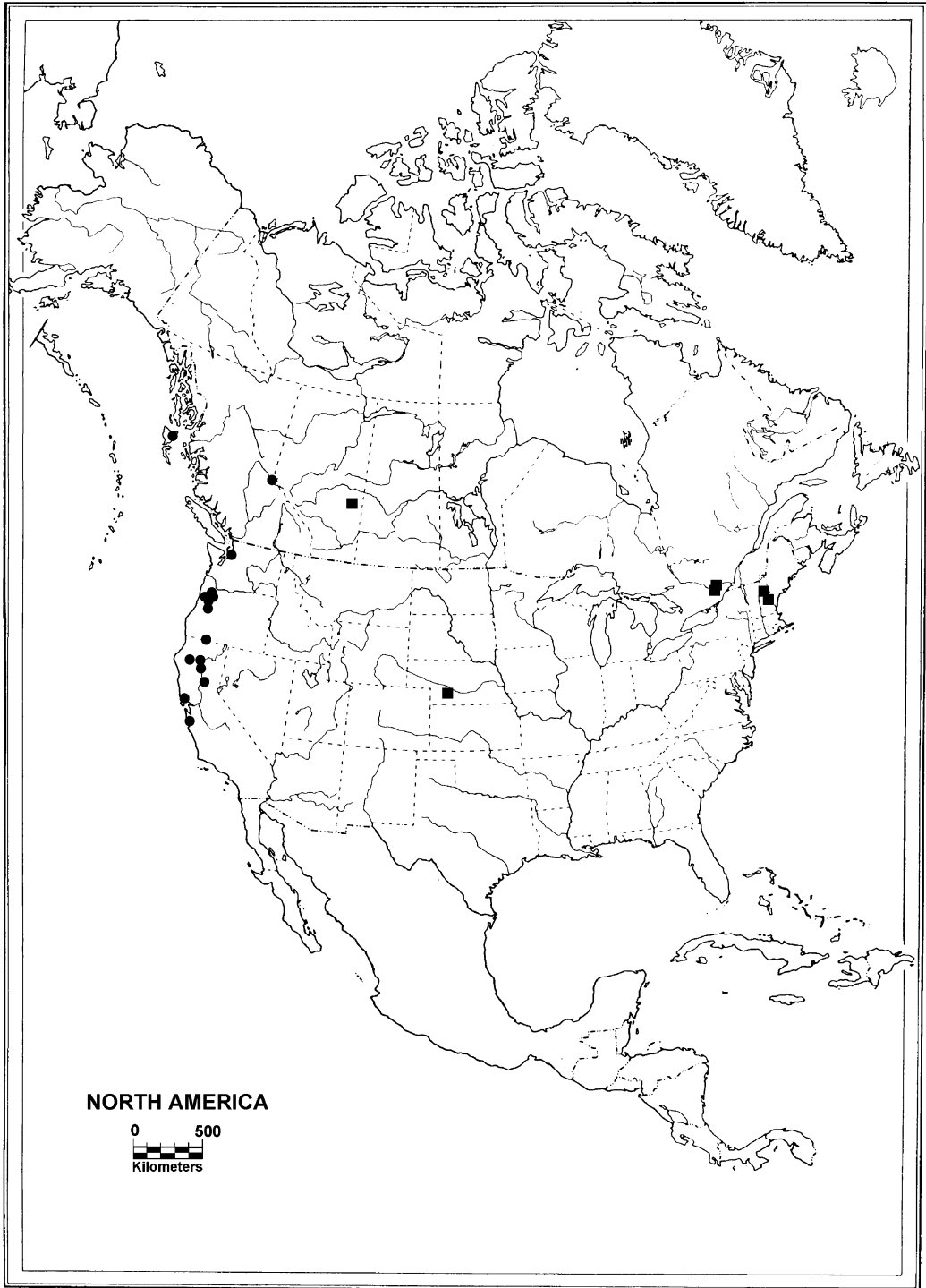


Fig. 93. Geographic distribution of *Agathidium pulchrum*-group species: *A. hamulum* = ■; *A. picipes* = ●.

moderately slender, unmodified; metasternal fovea anterior, large, transversely linear, with series of fine, dense setae. Median lobe in lateral aspect slender, strongly and conspicuously bent medially, apical portion short, slender, directed slightly dorsad, apex very narrowly rounded (fig. 81); in ventral aspect slender, lateral margins subparallel, apical portion broad, subapically slightly constricted, apex narrowly rounded (fig. 80); operculum small, apically bilobate (fig. 80); lateral lobes slender, very broad basally, strongly curved medially, apically pointed with 2 prominent setae (figs. 80, 81).

Female tarsi 5-4-4.

DISTRIBUTION: This species is found along the West Coast from northern California north to British Columbia (fig. 93).

SPECIMENS EXAMINED: CANADA: *British Columbia*: Stanley, 13 Jul 1931, WG Mathers (1, CASC); Mt Robson P Park Berg Lake Trailhead, 11 Jul 1984, FIT, RS Anderson (9, CNCI); Charlotte Islands Graham Island 4 mi S Port Clementa, 27 Jun 1984, sitka spruce hemlock/cedar forest, RS Anderson (1, CNCI).

UNITED STATES: *California*: Butte Co.: 2 mi SW Sterling City, 29 May 1981, live oak, alder litter, DS Chandler (1, DENH); Marin Co.: Samuel P. Taylor St Park, 31 Mar 1976, bay litter, Berlese, FG Andrews, TD Eichlin (1, FGAC); Santa Cruz Co.: Jun 1896 (1, WSUC); Teh. Co.: 6 mi W Log Springs, Mendocino Natl Forest, 29 Nov 1986, 2500', oak leaf litter, DS Chandler (5, CNCI); 5 mi SE Manton Bluff Springs, 1 Dec 1987, 2500', fern leaf litter on stream edge, DS Chandler (2, CNCI); Snoqualmie Gulch, 10 mi SE Manton, 1 Dec 1986, 2850', live oak leaf litter, DS Chandler (1, CNCI); 6 mi W Log Springs, Mendocino Natl Forest, 29 Nov 1986, oak leaf litter, DS Chandler (10, CNCI); Trinity Co.: Del Loma, 1 May 1985, *Alnus* duff, TR Haig (1, FGAC); 4 mi W Forest Glen, 1 Jul 1975, 3300', leaf litter, mixed hardwood conifer forest, A Newton, M Thayer (1, MCZC); Del Loma, 23 Feb 1978, *Alnus* duff, Berlese, TR Haig (1, FGAC). *Oregon*: Forest Grove, 17 May 1941 (2, MCZC); Benton Co.: 2 mi NW Adair Village, 14 May 1983, grass sod, DS Chandler (1, DENH); Corvallis, 24 Nov 1950, V Roth (1, PECK); Jackson Co.: Soda Mtn Rd, 8 mi S 13 mi E Ashland, 15 Oct 1972, 5400', E Benedict (1, CNCI); Soda Mtn Rd 8 mi S 13 mi E Ashland, 15 Oct 1972, 5400', serviceberry duff, E Benedict (1, CUIC); 8 mi S, 13 mi E Ashland, 15 Oct 1972, 5400', oak duff, E Benedict (10, PECK); Polk Co.: Eola Hills nr Homan Wayside, 4 May 1969, RL Westcott (6,

RLWE); Washington Co.: 3 mi SW Tualatin, 1 Jan 1972, madrone duff, E Benedict (1, PECK). *Washington*: Seattle (1, MCZC).

DISCUSSION: The names *A. picipes*, *A. con-tiguum*, *A. c.* var *varipunctatum*, and *A. striolum* are synonyms based on examination of the types of each species. *Agathidium picipes* has priority. Although there is a fair amount of variation in coloration, punctation, and other features among specimens of this species (which led in part to the proliferation of names), the very distinctive male genitalia are identical between populations of this species. *Agathidium striolum* was placed near *A. concinnum* based on a putatively more "well-developed" temporum. However, it does not appear to have a temporum more well developed than other specimens of *A. picipes* and certainly not as strongly developed as in the *A. concinnum* species group.

This species has been collected from throughout the year. It has been collected from bay litter, fern leaf litter, grass sod, mixed hardwood and conifer forest, live oak litter, madrone duff, serviceberry duff, and Sitka spruce-hemlock-cedar forest.

Agathidium hamulum Miller and Wheeler,
new species

Figures 14, 82, 83, 93

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "NEB.FrontierCo. Curtis 20.IX.63 Rapp.extreehole/HOLOTYP *Agathidium hamulum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, Nebraska, Frontier Co., Curtis.

DIAGNOSIS: This species differs from other members of the group by the concolorous brown dorsal surfaces that lack microreticulation, the anterior clypeal margin strongly excavated (fig. 14), the postocular temporum not forming a prominent rim posterad of the eye (fig. 14), the male metasternal fovea distinctly anterad of middle along midline of metasternum, the male lateral lobe not expanded apically (fig. 83), the median lobe of the aedeagus in lateral aspect curved, but not bent medially, and apex with small, abrupt hook (fig. 83), and the male mandibular horn, when present, long, rounded in cross section,

setose, extending over front of head. Females have 4-4-4 tarsi.

DESCRIPTION: Body moderately large (TBL = 2.53–3.01 mm), rotund (PNW/TBL = 0.46–0.49), laterally broadly rounded, strongly contractile.

Head, pronotum, and elytra yellow-brown to red-brown; sterna, antennae, and palpi yellow; legs yellow-brown.

Head broad (fig. 14) (MDL/OHW = 0.54–0.65), dorsally flat, often with indistinct, transverse, medial crease; temporum short, forming slight rim at posterior margin of eye (fig. 14); head finely punctate, surfaces shiny and smooth between punctures; eyes large, rounded, finely faceted; frontoclypeal suture obsolete medially; clypeal margin strongly excavate, margin curved (fig. 14); labrum anteromedially entire; antennomere ratios: length I:II:III = 2.2:1.0:1.6, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum broad (PNL/PNW = 0.52–0.63), laterally not strongly produced, lateral margins moderately broad, anterolateral angle subquadrate, posterolateral angle distinctive, slightly more rounded than anterolateral angle; punctation similar to that of head. Elytra relatively elongate, lateral margins broadly rounded (SEL/ELW = 1.14–1.17); punctation similar to pronotum, surface between punctures shiny and smooth; sutural stria about one-half length of elytron. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior about one-half length of posterior portion; medial longitudinal carina somewhat evident on anterior portion. Metasternum moderately narrow medially (MTL/MTW = 0.24), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately broad and with large ventral field of spatulate setae; mandibular horn when present moderately short, rounded in cross section, extending up and curving slightly posteriorly, punctate and setose along its length, with moderately prominent apical fovea and series of fine setae; metafemur broad, unmodified; metasternal fovea anterad of middle, large, transversely slightly oval, with large brush of fine, dense setae. Median lobe in lateral aspect with moderately large basal portion, evenly curved throughout, apical portion short straight to

abruptly dorsally hooked, pointed apex (fig. 83); in ventral aspect slender, lateral margins subparallel, apical portion tapered to narrowly rounded, slightly protuberant apex (fig. 82); operculum a short flattened lobe with apical emargination (fig. 82); lateral lobes relatively short, slender, apices somewhat truncate, each with 2 long, stout setae (figs. 82, 83).

Female tarsi 4-4-4.

ETYMOLOGY: This species is named from the Latin word *hamulus*, meaning “hook”, for the hooked apex of the median lobe in lateral aspect.

DISTRIBUTION: This species is widespread, but apparently rarely collected. It has been found from Alberta east to New Hampshire and south to Nebraska (fig. 93).

PARATYPES: CANADA: *Alberta*: Tp32Rg6W5 mer, 22 Aug 1981, aspen, BF and JL Carr (4, CARR). *Ontario*: Alfred Bog, 2 Jul 1984, M Sanbourne (1, PECK); Manitoulin R 2 mi S Maple Pt, 23 May 1982, FIT, A Ritchie (1, CUIC). *Quebec*: Gatineau Park nr Pinks Lake, 27 May 1980 (1, CUIC).

UNITED STATES: *Nebraska*: Frontier Co.: Curtis, 20 Sep 1963, tree hole, Rapp (1, CUIC). *New Hampshire*: Carr. Co.: The Bowl, 2.5 mi NW Wonalancet, 5 Jun 1985, FIT, DS Chandler (1, CNCI); 1 mi N Wonalancet, E Park Spring. Brk, 15 Jun 1985, FIT, DS Chandler (2, CNCI); Coos Co.: Mt Washington, halfway house, 25 Jun 1982, birch fir litter, DS Chandler (3, DENH).

DISCUSSION: Specimens have been collected from May to September. Habitat data include aspen and birch litter.

Agathidium politum LeConte
Figures 15, 84, 85, 92

Agathidium politum LeConte, 1866: 370; Horn, 1880; Leng, 1920; Fall, 1934b.

TYPE MATERIAL: Holotype, ♂ in MCZC labeled “Penn/Type 3171 [number handwritten, two-thirds of label red]/A. politum Lec. [handwritten]”. LeConte had a single individual on which he based his description, so it is the holotype by monotypy.

TYPE LOCALITY: United States, Pennsylvania, York Co.

DIAGNOSIS: This species differs from other members of the group by having a concolorous dorsal surface, no microreticulation, the anterior clypeal margins strongly excavated

(fig. 15), the male metasternal fovea located distinctly anterad of the middle of the metasternum, and the male left mandibular horn, when present, long, semiflattened, and setose. The median lobe of the aedeagus is relatively slender and simple (figs. 84, 85).

DESCRIPTION: Body moderately large (TBL = 3.16 mm), robust (PNW/TBL = 0.45), broadly rounded, moderately contractile.

Head dark red; pronotum and elytra red to dark red; venter red to red-yellow; basal antennomeres red-brown, club antennomeres brown; palpi red; legs red to red-yellow.

Head broad (fig. 15) (MDL/OHW = 0.61), flattened, often with prominent transverse, medial crease; tempora very short, often forming slight rim at posterior margin of eye (fig. 15); head finely punctate, with fine, inconspicuous microsculpture; eyes large, rounded, finely faceted; frontoclypeal suture moderately well defined medially; clypeal margin strongly excavate (fig. 15); anterior margin of labrum entire; antennomere ratios: length I:II:III = 2.3:1.0:1.8, width VII:VIII:IX = 1.0:1.0:2.3. Pronotum broad (PNL/PNW = 0.68), laterally not strongly produced, anterolateral angle subquadrate, posterolateral angle distinctive, but rounded; punctation and surface microsculpture similar to those of head. Elytra robust (SEL/ELW = 1.00); nearly impunctate to finely and sparsely punctate, surface between punctures shiny and smooth; sutural stria about one-half length of elytron on most specimens. Mesosternum strongly concave posteriorly, without prominent lobe extending ventrally between mesocoxae, anterior portion about one-half length of posterior portion; medial longitudinal carina absent on anterior portion. Metasternum moderately narrow medially (MTL/MTW = 0.23), slightly convex, setose; oblique carinae absent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly expanded and with small ventral field of spatulate setae; mandibular horn long, slightly flattened, setose, extending dorsally over clypeus, apically rounded with prominent fovea and brush of setae; metafemur moderately broad, otherwise unmodified; metasternal fovea moderately large, slightly transversely oval, slightly anterior of middle, with large brush of fine, dense setae. Median lobe in lateral aspect moderately

broad, basal portion somewhat robust, slightly curved, apical portion triangular, apex acutely pointed (fig. 85); in ventral aspect moderately slender, lateral margins subparallel, apical portion triangular, apex narrowly rounded (fig. 84); operculum broad, flat, moderately long, apex broad, truncate (fig. 84); lateral lobes slender, broader basally and tapering evenly throughout, apically rounded and with 2 long, stout setae (figs. 84, 85).

Female unknown.

DISTRIBUTION: This species is only known from the type locality in Pennsylvania (fig. 92).

DISCUSSION: Horn (1880) synonymized *A. parvulum* with this species, but this was rejected by Fall (1934) and the species was resurrected. We concur that *A. politum* is a separate species from *A. parvulum*. Although numerous specimens are identified as *A. politum* in collections, these specimens are other species, usually *A. atronitens*. The only specimen we have found to be this species is the holotype.

AGATHIDIUM COMPRESSIDENS SPECIES GROUP

DIAGNOSIS: This group differs from others by the combination of moderately strong contractility, impunctate dorsal surfaces, broad anterior and posterior portions of the mesosternum, posterior portion of the mesosternum moderately strongly concave, and metasternum relatively narrow medially and with very weakly developed oblique carinae.

DISCUSSION: Fall (1934b) and Hatch (1936) allied the species *A. compressidens* with members of the *A. oniscoides* group while pointing out some of the differences. The species exhibit the contractility and lack of dorsal punctation similar to members of the *A. oniscoides* group. They also have the humeral angles of the elytron obsolete. However, the mesosternum has a relatively broad posterior portion that is distinctly concave. Also, the oblique metasternal carinae are only weakly developed. The species are also similar to certain members of the *A. revolvens* group, such as *A. virile*, which have a somewhat convex posterior portion of the mesosternum. Thus, the members of the *A. compressidens* group appear intermediate between these groups and others, and they do

not clearly fit into any. Therefore, we have elected to place them in their own group. Two of the three species, one eastern and one western, possess a prominent medial lobe on the first visible abdominal sternite, but the third species, the western *A. fenderi*, does not. The abdominal lobe is a seemingly clear synapomorphy, but the similarities between *A. fenderi* and the lobed species are not strong, and this grouping may be artificial.

KEY TO *A. COMPRESSIDENS*
SPECIES GROUP

1. First visible abdominal sternite with a prominent, medial, lobelike prominence near posterior margin 2
- First visible abdominal sternite without a prominent, medial lobe . . . *A. fenderi* Hatch
- 2(1). Size smaller (TBL < 2.6 mm) ; male metasternal fovea very large, circular, located medially; median lobe of aedeagus in ventral aspect with apical portion very abruptly narrowed and sharply acuminate (fig. 96), with operculum large and deeply and broadly bifid with each ramus long, parallel-sided and straight (fig. 96); California and Oregon (fig. 104)
. *A. vesperpressidens* new species
- Size larger (TBL > 2.6 mm) ; male metasternal fovea moderately large, transverse, located distinctly posterad of middle; median lobe of aedeagus with apex only slightly acuminate, more gradually narrowed (fig 99), with operculum moderately large and rounded, platelike with narrow medial emargination (fig. 99); eastern North America (fig. 104)
. *A. compressidens* Fall

Agathidium fenderi Hatch
Figures 94, 95, 104

Agathidium fenderi Hatch, 1957: 36.

TYPE MATERIAL: Holotype, ♀ in USNM labeled "Boyer, Ore. May 15, 37 [handwritten]/soil samp [handwritten]/H-314/1-1189/Agathidium 3 [handwritten, label folded]/TYPE ♂ Agathidium (s. str.) fenderi 1953—M.H. Hatch [handwritten, red label]".

TYPE LOCALITY: United States, Oregon, Lincoln Co., Boyer.

DIAGNOSIS: This species differs from other members of this group by lacking a medial lobe on the first visible abdominal sternite. Also, the male metasternal fovea is relatively

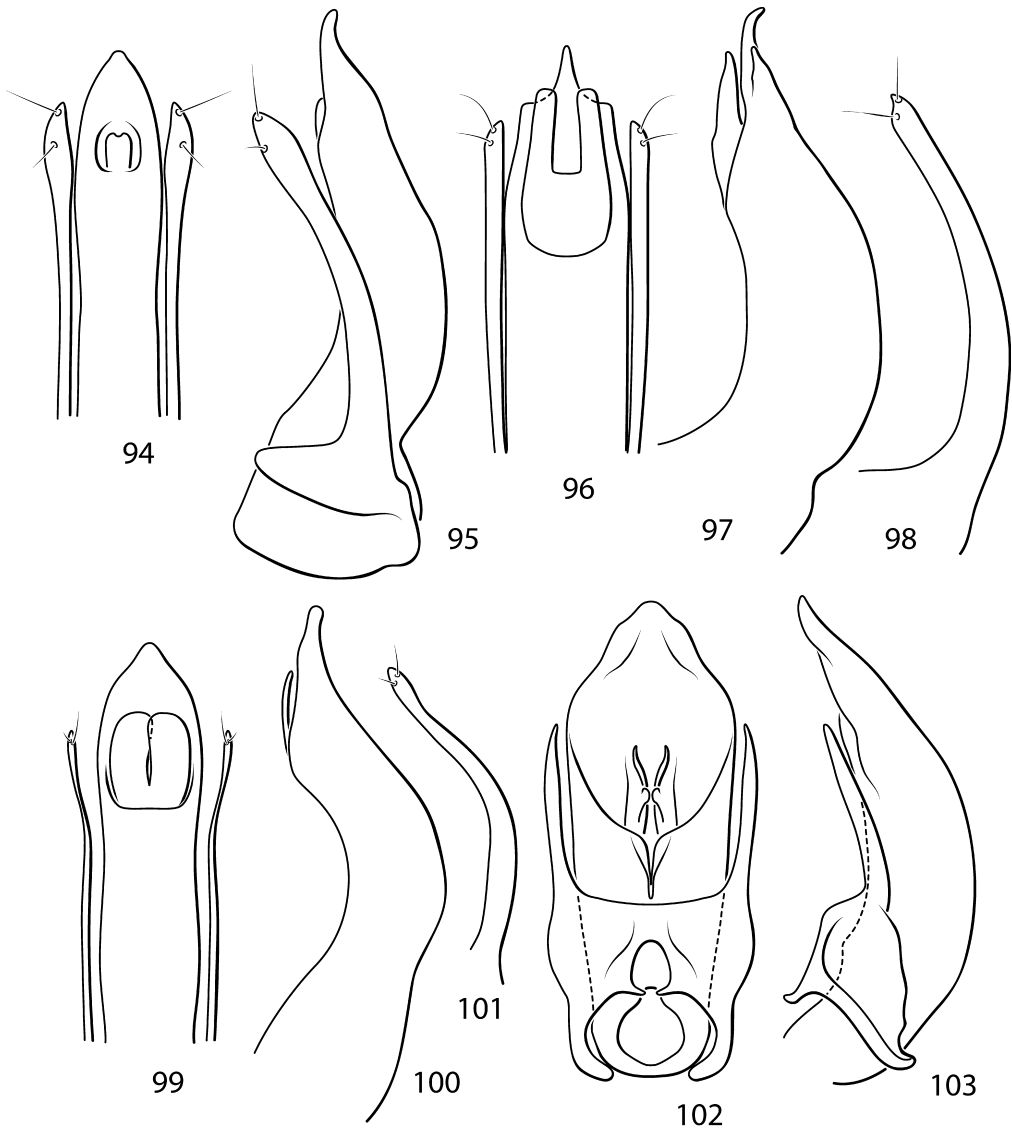
large, rounded, and located slightly posterad of the middle. The median lobe of the aedeagus is relatively simple (figs. 94, 95) with the operculum reduced to a small, truncate lobe (fig. 94).

DESCRIPTION: Body moderately large (TBL = 2.16–2.55 mm), broad (PNW/TBL = 0.48–0.49), robust, rounded, strongly contractile.

Head and pronotum piceous to dark red; elytra dark red; venter red-brown; antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.47–0.70), dorsal surface very broadly convex, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes protruding and prominent, large, finely faceted; gula slightly concave, unmodified; clypeus strongly excavate; antennomere ratios: length I:II:III = 2.1:1.0:1.8, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.67–0.70), strongly convex, anterolateral lobes strongly produced, lateral margin with rounded, but distinct antero- and posterolateral angles; surface with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.00–1.25); punctation similar to pronotum; sutural stria absent. Flight wings fully developed. Mesosternum broad, anterior portion longer than posterior portion; distinctly concave posteriorly, but not strongly declivitous; medial longitudinal carina well developed on anterior portion. Metasternum narrow medially (MTL/MTW = 0.12), subhorizontal to slightly convex medially; oblique femoral carinae faint or absent, not meeting medially. Abdominal sternite III (first visible sternite) without prominent medial lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres relatively broadly laterally expanded, with large field of ventral spatulate setae; mandibles not modified; metafemur relatively slender, unmodified; metasternal fovea large, prominent, round, with pencil of long, fine, dense setae, located posterad of middle of metasternum. Median lobe in lateral aspect very robust, curved medially, apical portion broad, curved dorsad, apex sharply



Figs. 94–103. *Agathidium compressidens*- and *A. iota*-group species, aedeagus: 94, 95, *A. fenderi*: 94, ventral; 95, lateral. 96–98, *A. vesperpressidens*: 96, ventral; 97, median lobe, lateral; 98, left lateral lobe, lateral. 99–101, *A. compressidens*: 99, ventral; 100, median lobe, lateral; 101, left lateral lobe, lateral. 102, 103, *A. iota*: 102, ventral; 103, lateral.

pointed (fig. 95); in ventral aspect broad, lateral margins subparallel, apical portion broad, with lateral margins rounded and converging to broadly rounded apex (fig. 94); operculum reduced to small truncate lobe which is apically slightly emarginate (fig. 94); lateral lobes moderately broad, apically somewhat expanded with 2 long, stout sub-

apical setae that are unequal in length (figs. 94, 95).

Female tarsi 5-4-4.

DISTRIBUTION. This species is known only from Oregon and northern California (fig. 104).

SPECIMENS EXAMINED: UNITED STATES: *California*: Del Norte Co.: Crescent City, 25 Mar

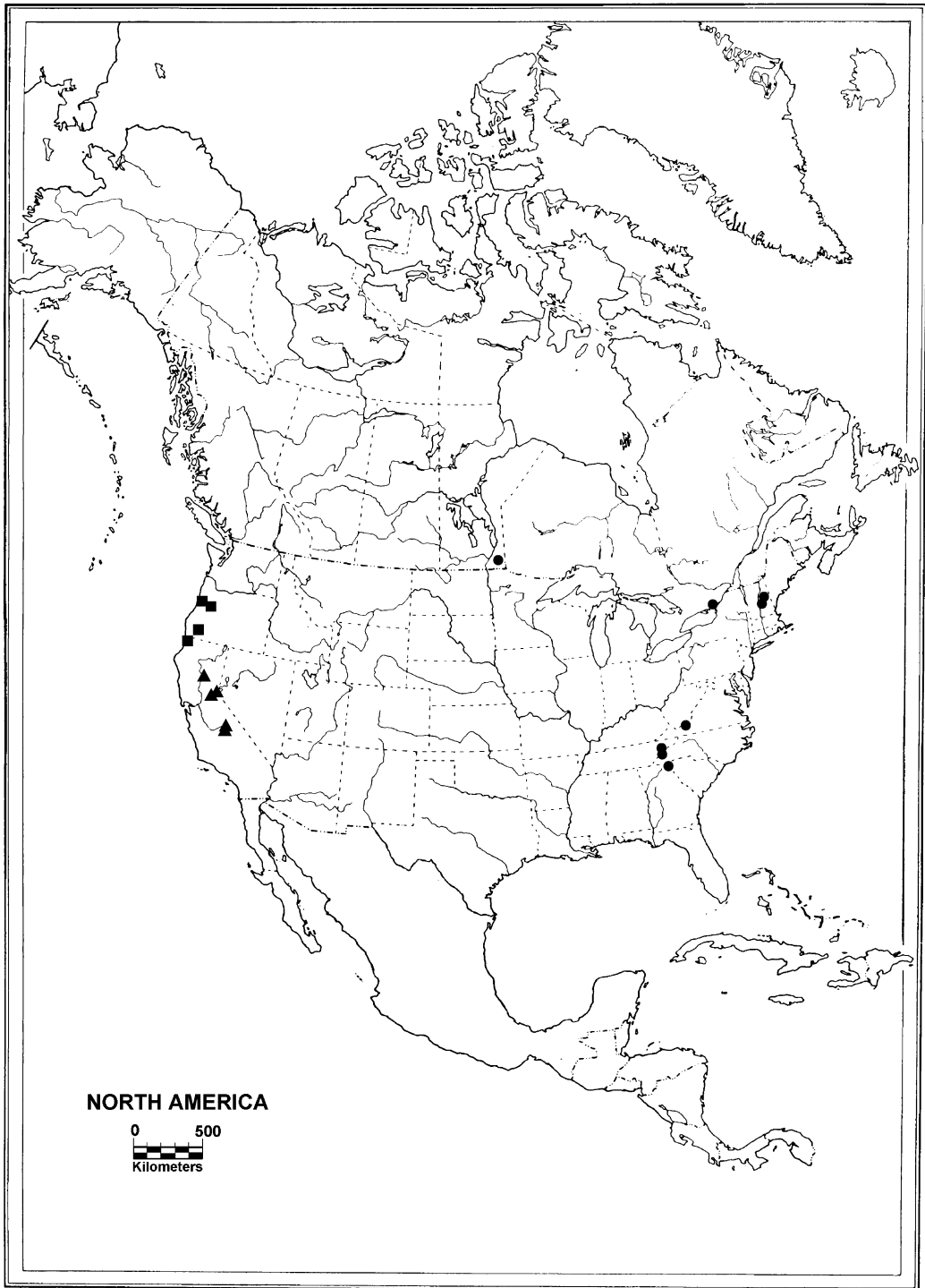


Fig. 104. Geographic distribution of *Agathidium compressidens*-group species: *A. compressidens* = ●; *A. fenderi* = ■; *A. vesperpressidens* Fall = ▲.

1978, pine duff, Berlese, TR Haig (1, AMNH). Oregon: Benton Co.: Mary's Peak, 17 May 1983, 3500', *Ribes* litter, DS Chandler (1, DENH); Josephine Co.: 6 mi N Galice, Rogue River, 8 Apr 1972, 500', madrone duff, E Benedict (1, CNCI).

DISCUSSION: The few specimens examined during this study were collected during April and May from soil samples and pine or madrone duff. Elevation records are from 500 to 3500 ft.

Agathidium vesperpressidens Miller and Wheeler, new species
Figures 96–98, 104

TYPE MATERIAL: Holotype, ♀ in CASC labeled "CALIF:Butte Co. 5 mi SE Butte Mds Cherry Hill Cpgd. V-7 thru 9-1976 Fred G. Andrews/Collected flying at dusk/HOLOTYPE *Agathidium vesperpressidens* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: USA, California, Butte Co., 5 mi NE Butte Meadows, Cherry Hill Campground.

DIAGNOSIS: This species is distinguishable by the presence of a prominent lobe medially on the ventral surface of the first visible abdominal sternite and by the shape of the male genitalia. The median lobe of the aedeagus is very robust; the apical portion consists of a broad basal portion abruptly narrowed to a long, slender spine in ventral aspect (fig. 96), and the operculum is deeply emarginate, consisting of long, parallel-sided, broadly separated rami (fig. 96). The species is most similar to *A. compressidens* from which it may be distinguished by the shape of the aedeagus (figs. 96–98). Also, *A. compressidens* is larger (TBL > 2.7 mm) and occurs in eastern North America (fig. 104), whereas *A. vesperpressidens* is smaller (TBL < 2.6 mm) and occurs in western North America (fig. 104).

DESCRIPTION: Body moderately large (TBL = 2.43–2.52 mm), broad (PNW/TBL = 0.48–0.49), robust, rounded, strongly contractile.

Head and pronotum red; elytra red, not iridescent; venter yellow to yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.55–0.62), dorsal surface flattened, dorsoventrally com-

pressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes protruding and prominent, large, finely faceted; gula slightly concave, unmodified; clypeus strong excavate; antennomere ratios: length I:II:III = 1.6:1.0:1.2, width VII:VIII:IX = 1.1:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.62–0.63), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.97–1.05); punctation similar to pronotum; sutural stria absent to faintly present only apically. Flight wings fully developed. Mesosternum broad, anterior portion longer than posterior portion; distinctly concave posteriorly, but not strongly declivitous; medial carina well developed on anterior portion. Metasternum narrow medially (MTL/MTW = 0.12–0.15), subhorizontal, slightly convex medially; oblique femoral carinae faint or absent, not meeting medially. Abdominal sternite III (first visible sternite) with prominent medial lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur relatively slender, without subapical tooth on posterior margin, but with small subbasal tooth; metasternal fovea very large, prominent, round, with pencil of long, fine, dense setae, located posterad of middle of metasternum. Median lobe in lateral aspect very robust, strongly curved medially, apical portion slender, straight, apex sharply hooked dorsad, sharply pointed (fig. 97); in ventral aspect very broad, apical portion broad basally, strongly narrowed, apically a long, slender process, slightly tapering to sharply pointed apex (fig. 96); operculum large, flat, medially very deeply emarginate, emargination elongate-rectangular, each ramus long, parallel-sided, apically truncate (fig. 96); lateral lobes small, slender, curved, shorter than median lobe, apically slightly expanded, each with 2 long, stout subapical setae (figs. 96, 98).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from

the Latin words *vesper*, meaning “west”, and *pressidens*, a portion of the root for *compressidens*, the specific name of a similar member of this species group, to signify the similarity of this species with *A. compressidens* and its western distribution.

DISTRIBUTION: This species has been collected from northern California (fig. 104).

PARATYPES: UNITED STATES: *California*: Tal-lac, July (1, CASC); Butte Co.: 5 mi NE Butte Meadows, Cherry Hill Campground, 7 May 1976, collected flying at dusk, F Andrews (1, FGAC); El Dorado Co.: Blodgett Forest, 27 Aug 1975, *Pinus ponderosa* log, Berlese, F Andrews, M Wasbauer (1, FGAC); Tulare Co.: Sequoia Natl Park, Huckleberry Meadow, 28 May 1984, 8000', R Baranowski (2, LUND); Sequoia Natl Park, Dorst Creek, 31 May 1984, 7000', R Baranowski (6, LUND); Sequoia Natl Park, Lost Grove, 4 Jun 1984, 7000', R Baranowski (1, LUND).

DISCUSSION: This species has been collected from a ponderosa pine log and “while flying”. Elevation records are from 7000 to 8000 ft.

Agathidium compressidens Fall
Figures 99, 100, 104

Agathidium compressidens Fall, 1934b: 106.

TYPE MATERIAL: Holotype, ♀ in MCZC labeled “Round Knob N.C. 6124 [handwritten]/♀/TYPE compressi-dens [name handwritten, red line under “TYPE”]/M.C.Z. Type 24033 [number handwritten, red label]/H.C. FALL COLLECTION”.

TYPE LOCALITY: United States, North Carolina, Round Knob.

DIAGNOSIS: This species is distinguishable by the presence of a prominent lobe medially on the ventral surface of the first visible abdominal sternite and by the shape of the male genitalia. The median lobe of the aedeagus is very robust, the apical portion is broad, flat, and apically pointed (fig. 99), and the operculum is broad, flat, and broadly rounded apically with a deep, narrow medial emargination (fig. 99). The species is most similar to *A. vesperpressidens* from which it may be distinguished by the shape of the aedeagus. Also, *A. vesperpressidens* is generally smaller (TBL < 2.7 mm).

DESCRIPTION: Body moderately large, broad (TBL = 2.84–3.38 mm), robust

(PNW/TBL = 0.48–0.49), rounded, strongly contractile.

Head and pronotum red; elytra red, not iridescent; venter yellow to yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.58–0.61), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes protruding and prominent, large, finely faceted; gula slightly concave, unmodified; clypeus strongly excavate; antennomere ratios: length I:II:III = 1.6:1.0:1.1, width VII:VIII:IX = 1.1:1.0:2.3. Pronotum very large, broad (PNL/PNW = 0.58–0.61), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.94–1.01); punctation similar to pronotum; sutural stria absent to faintly present only apically. Flight wings fully developed. Mesosternum broad, anterior portion longer than posterior portion; distinctly concave posteriorly, but not strongly declivitous; medial longitudinal carina well developed on anterior portion. Metasternum narrow medially (MTL/MTW = 0.14–0.16), subhorizontal, slightly convex medially; oblique femoral carinae faint, not meeting medially. Abdominal sternite III (first visible sternite) with prominent medial lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur relatively slender, with very small subapical tooth on posterior margin; metasternal fovea moderately large, prominent, transversely ovoid, with pencil of long, fine, dense setae, located posterad of middle of metasternum. Median lobe in lateral aspect very robust, strongly curved medially, apical portion slender, curved dorsad, apex pointed (fig. 100); in ventral aspect very broad, apical portion broad, short, narrowed to pointed apex (fig. 99); operculum large, flat, rounded (fig. 99); lateral lobes small, slender, curved, much

shorter than median lobe, each with 2 long, stout subapical setae (figs. 99, 101).

Female tarsi 5-4-4.

DISTRIBUTION: This species is known from eastern North America from Ontario and Manitoba to New Hampshire and south to South Carolina and Tennessee (fig. 104).

SPECIMENS EXAMINED: CANADA: *Manitoba:* Rennie, Lily Pond, Whiteshell Prov. Park, 6 Jun 1984, maple-poplar forest, FIT, S and J Peck (1, PECK). *Ontario:* Chaffey's Locks QUBS, 2 Sep 1980, litter, on "fleshy fungi", S Peck (1, CNCI).

UNITED STATES: *New Hampshire:* White Mts, woods (1, MCZC); Coos Co.: Jefferson Notch, 19 Sep 1974, 3000', under conifer bark, A Newton, JF Lawrence (1, MCZC); Grafton Co.: Hubbard Brook Exp. Forest, Bear Brook, 15 Oct 1982, leaf litter, DS Chandler (1, DENH). *North Carolina:* Round Knob, 24 June (1, MCZC); Appalachian Trail to Clingman's Dome, 19 Aug 1981, on *Comatrichia*-like slime mold, QD Wheeler (1, QDWC). *South Carolina:* Oconee Co.: 12 mi NW Walhalla Oconee St Park, 5 Jun 1981, 1700', log-bark litter, 1, S Peck (1, CNCI). *Tennessee:* Cocke Co.: GSMNP, Albright Grove Tr. 83°16'45"W, 35°44'10"N, 19 Oct 2001, 1000 m, decid stump, Carlton (2, LSAM). *Virginia:* Giles Co.: Mtn Lake Biol. Sta., 15 Sep 1990, 3700', on *Arcyria denudata*, SL Stephenson (1, QDWC).

DISCUSSION: This species was described from female specimens only. However, we are confident in the assignment of male specimens to this species since we were able to examine a male and female in the same series. The species is relatively rare in collections, and the longest series of specimens examined was two. Specimens have been collected from June to October. They have been found from under conifer bark and from various litter sources including maple-poplar forest, leaves, logs and bark, and a deciduous stump. Elevation records are from 1700 to 3000 ft. Host records include a "fleshy fungus", *Arcyria denudata*, and a *Comatrichia*-like slime mold.

AGATHIDIUM IOTA SPECIES GROUP

DIAGNOSIS: The single species in this group has the anterior portion of the mesosternum very broad (broader than the posterior portion), the mesosternum in the same plane as the metasternum, strong contractility, obsolete humeral angles of the elytra, minute size (TBL < 1.6 mm), and 4-3-3 tarsal

formulae in both males and females. Males lack a metasternal fovea, and the posterior margin of the metafemur is unmodified.

DISCUSSION: This species further confirms the already dubious definition of the genus *Agathidium*. The species possesses a distinctive 3-segmented antennal club, moderately, but distinctly, excavated anterior clypeal margin, and distinctive temporum and supraocular carina extending posterad of the eye. However, it also has the unusual character state of 4-3-3 tarsal formulae in both males and females. The wings, when present, are long and fringed with fine setae, a feature characteristic of many small insects that balloon with the wind. The single species has the anterior portion of the mesosternum very broad, much broader than the posterior portion, which is very short and not at all concave or declivitous. The mesosternum is in the same plane as the metasternum. Also, specimens are very stout and strongly contractile and the metasternum is short. Thus, the species is very similar to members of the *A. oniscoides* group. However, the species lacks oblique femoral lines on the metasternum and has a particularly unusual tarsal formula, prompting us to place it in its own group.

Agathidium iota Miller and Wheeler, new species

Figures 102, 103, 359

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "MEXICO: S.L.P. 14 mi. W Xilitla, 4800 ft., Liq. for. VI.29.73 A.Newton/leaf & log litter/HOLOTYPE *Agathidium iota* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, San Luis Potosi, 14 mi W Xilitla, 4800'.

DIAGNOSIS: This is the only species in the group and has the diagnostic characters of the group (see above).

DESCRIPTION: Body minute (TBL = 1.15–1.51 mm), rounded (PNW/TBL = 0.43–0.53), strongly contractile.

Head, pronotum, and elytra red-brown, not iridescent; venter, antennae, palpi, and legs yellow-brown.

Head broad (MDL/OHW = 0.40–0.72), dorsal surface flattened, dorsoventrally com-

pressed; temporum reduced, not prominent, supraocular carina extending posteriorly to margin of head; surface of head with extremely fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes somewhat reduced, dorsoventrally compressed, relatively large-faceted; gula unmodified; clypeus moderately excavate; antennae relatively short (ratios: length I:II:III = 1.8:1.0:1.0, width VII:VIII:IX = 1.0:1.0:1.9). Pronotum very large, broad (PNL/PNW = 0.69–0.80), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with minute, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, slightly elongate, but not apically acuminate (SEL/ELW = 0.73–1.47); punctation similar to pronotum; sutural stria indistinctly present apically. Flight wings absent or present, long, narrow, fringed with fine setae. Anterior portion of mesosternum very broad, convex, medial carina prominent anteriorly, obscured posteriorly; posterior portion very short, not concave. Metasternum very short (MTL/MTW = 0.09–0.14), flattened, medially slightly sloped dorsad anteriorly; oblique femoral carinae absent.

Male tarsi 4-4-3; pro- and mesobasotarsomeres not laterally expanded, with few or no ventral spatulate setae; mandibles not modified; metafemur relatively slender, unmodified; metasternal fovea absent. Median lobe in lateral aspect very broad and robust basally, with subbasal constriction, curved, short, and moderately slender distad of constriction, apical portion narrowed, tapering to long, sharp point (fig. 103); in ventral aspect very broad, lateral margins broadly curved, apical portion broadly triangular, apex broadly pointed (fig. 102); operculum absent (fig. 102); lateral lobes short, slender, glabrous (figs. 102, 103).

Female tarsi 4-4-3.

ETYMOLOGY: This species is named after the smallest Greek letter *iota*, for the extremely small size of members of this species.

DISTRIBUTION: This species is known from southern Mexico and Guatemala (fig. 359).

PARATYPES: MEXICO: *Guerrero*: 10.3 km SW Filo de Caballo, 17 Jul 1992, 2700 m, oak-pine-fir forest, leaf log litter, Berlese, R Anderson (1, CNCI); 10.3 km SW Filo de Caballo, 17 Jul 1992, 2700 m, oak-pine-fir forest (wet), leaf-log litter, Berlese, RS Anderson (5, MCZC). *Michoacan*: 18 Sep 1973, 9400', oak-pine litter, A Newton (2, CNCI). *Oaxaca*: S. Suchixtepec, 24 Jul 1992, wet riparian alder forest, leaf litter, Berlese, RS Anderson (12, MCZC). *Verapaz*: 14.5 km S Purulha, 26 May 1991, 1600 m, riparian bottomland, oak forest litter, RS Anderson (2, MCZC).

DISCUSSION: *Agathidium iota* has been collected from leaf litter in a variety of habitats including pine, oak, and fir mixed forests and wet alder riparian forests. All known specimens were collected from sifting or Berlese samples. Elevation records are from 1600 to 2700 m. This is the smallest species of Agathidiini known.

AGATHIDIUM ONISCOIDES SPECIES GROUP

DIAGNOSIS: This group is characterized by the relatively horizontal ventral surface of the mesosternum, which is in approximately the same plane as the metasternum (with the posterior portion not concave), the broad anterior portion of the mesosternum which generally has a prominent medial carina, highly contractile body form, very broad pronotum, and broadly rounded posterolateral angles of the pronotum (fig. 105), broadly rounded humeral angles of the elytra, relatively impunctate dorsal surface and presence of distinct, oblique femoral lines on the metasternum which often meet medially in a prominent, posteriorly directed flange. The species range from minute to large, are usually dark red-brown to piceous dorsally, and males often have a distinctive tooth on the posterior margin of the metafemur.

DISCUSSION: This species group corresponds to the subgenus *Agathidium* sensu stricto *auctorum*. The group includes a fantastic diversity of relatively similar species. Although a large number of species are described here, it is certainly likely that the true species diversity remains yet to be described. The species are particularly numerous in the eastern United States, particularly the southern Appalachians, and in the mountains of Mexico, where we especially expect the

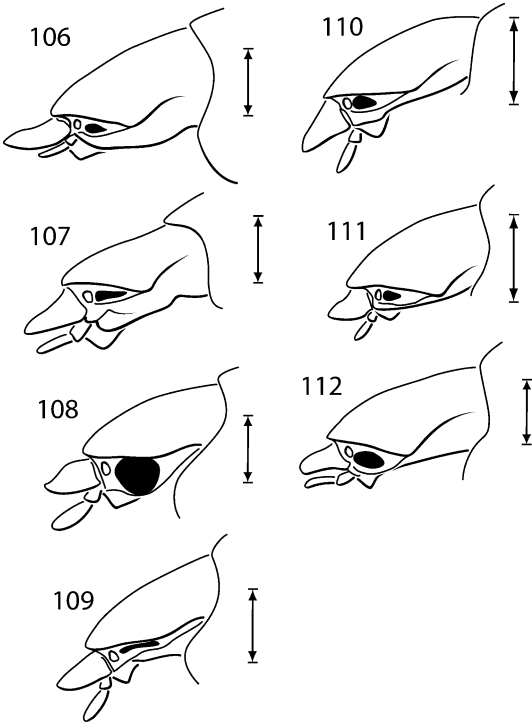


Fig. 105. *Agathidium aztec*, dorsal habitus.

number of species to increase with additional collection of specimens. Many of the species in this group are apparently cryptic in habitat and are often collected from forest litter samples and Berlese extraction. Often these species have the eyes reduced and are apterous. The strongly contractile nature and ball-

shaped habitus make these species distinctive.

To facilitate management of this large group, the species were arranged into subgroups. Unfortunately, a great many of the species and groups of species are identifiable only from males, and many of these only by



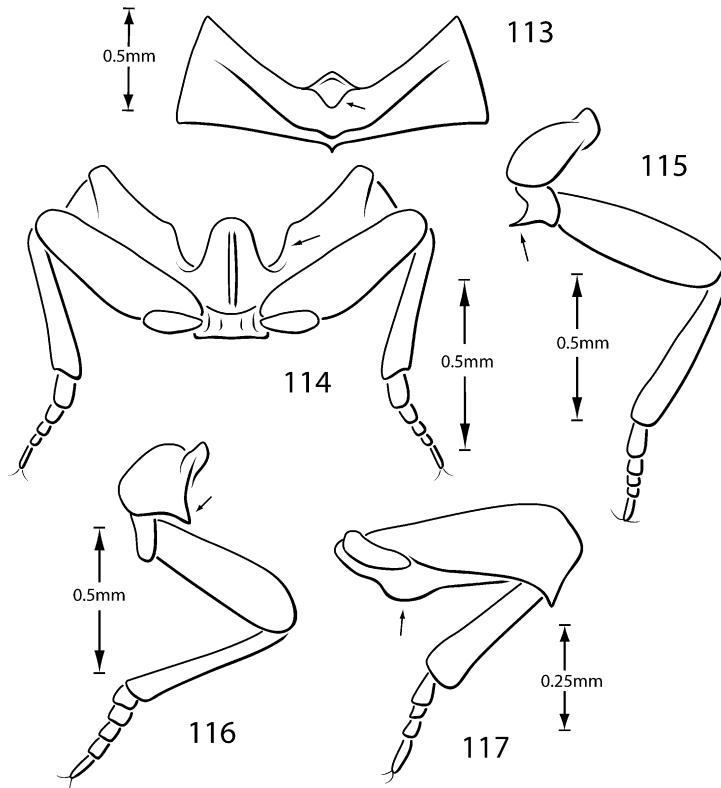
Figs. 106–112. *Agathidium oniscoides*-group species, heads, left lateral aspect: **106**, *A. vaderi*. **107**, *A. kimberlae*. **108**, *A. oculum*. **109**, *A. stenomma*. **110**, *A. microphthalmum*. **111**, *A. nimbo-silva*. **112**, *A. chauliodoum*. Bars = 0.5 mm.

dissection of genitalia. The key relies on dissection and critical examination of male genitalia, an unavoidable problem because of the state of our knowledge of the group at this time. Other characters of importance are the shape of the male metafemoral tooth, the presence of modifications such as lobes or tubercles on the surface of the gula, the development of the eyes and the nature of the oblique metasternal carinae and male metasternal fovea.

KEY TO *A. ONISCOIDES* SPECIES GROUP

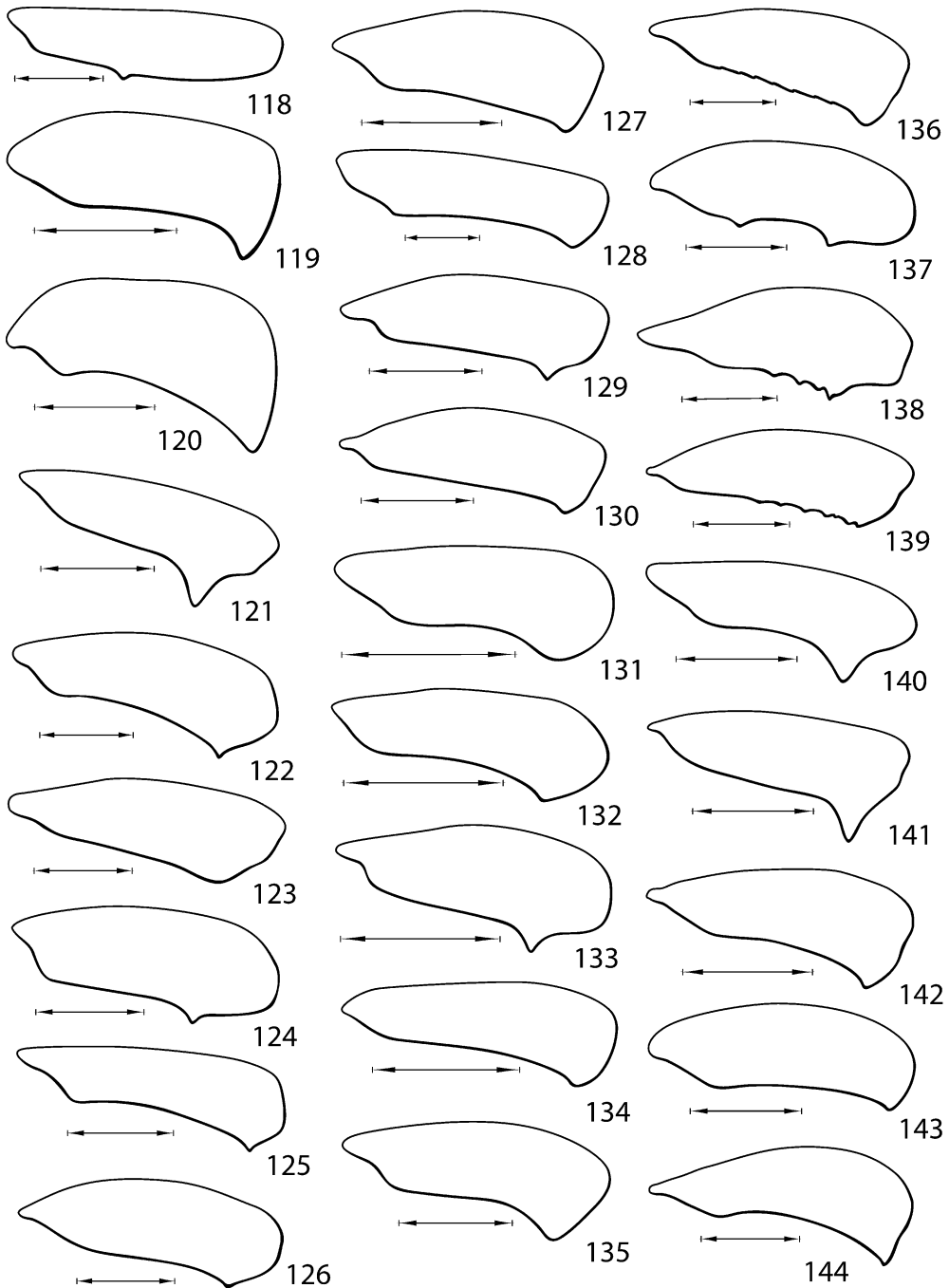
- 1. Median lobe of aedeagus apically deeply emarginate, with two long apical rami (figs. 174, 178); operculum long, slender, and with conspicuous lateral teeth (figs. 173, 177); eyes reduced to elongate triangles (figs. 106, 107) (*A. kimberlae* subgroup) 5
- Median lobe of aedeagus apically entire, operculum various, in some cases apically ex-

- panded into lateral teeth, but generally without multiple, conspicuous lateral teeth; eyes various 2
- 2(1). Median lobe of aedeagus with moderate to very prominent longitudinal, lateral sulcus at base of apical portion which is subtended by two lateral carinae or a single dorsal carina and a lateral carina (e.g., figs. 184, 186); lateral lobes apically variously sinuate and often expanded (e.g., figs. 184, 187), sinuate portion of lobe fitting into lateral sulcus of median lobe of aedeagus; Mexico and Central America (*A. aztec* subgroup) 6
- Median lobe of aedeagus without prominent lateral sulcus at base of apical portion; lateral lobes straight or evenly curved apically; distribution various 3
- 3(2). Operculum of median lobe of aedeagus completely divided into two long rami (e.g., fig. 309); median lobe of aedeagus in ventral aspect with lateral margins distinctly sinuate near base (e.g., fig. 309); metasternum very short medially (MTL/MTW = 0.08–0.17); male metafemoral tooth large and prominent, subapical, and sharply pointed; eastern United States (*A. dentigerum* subgroup) 40
- Operculum of median lobe of aedeagus sometimes apically emarginate, in some species relatively deeply so, but never entirely divided to base; median lobe of aedeagus in ventral aspect with lateral margins not sinuate near base; metasternum various, but generally longer (MTL/MTW = 0.12–0.28); male metafemoral tooth various, from reduced to a small, apical tooth on the posterior margin to a relatively large subapical tooth; distribution various 4
- 4(3). Eyes extremely reduced to tiny ovals or minute triangles consisting of only a few facets (figs. 110–112); Mexico and Central America (*A. microphthalmum* subgroup) 50
- Eyes relatively large and multifaceted to somewhat dorsoventrally compressed but not strongly reduced to tiny ovals or minute triangles; United States and Canada (*A. oniscoides* subgroup) 52
- 5(1) (*A. kimberlae* subgroup). Apical rami of median lobe of aedeagus apically expanded and truncate (fig. 173); operculum long, extending nearly to apex of median lobe of aedeagus (fig. 173); male metafemoral tooth large and metafemur very broad (fig. 120); eyes very strongly re-

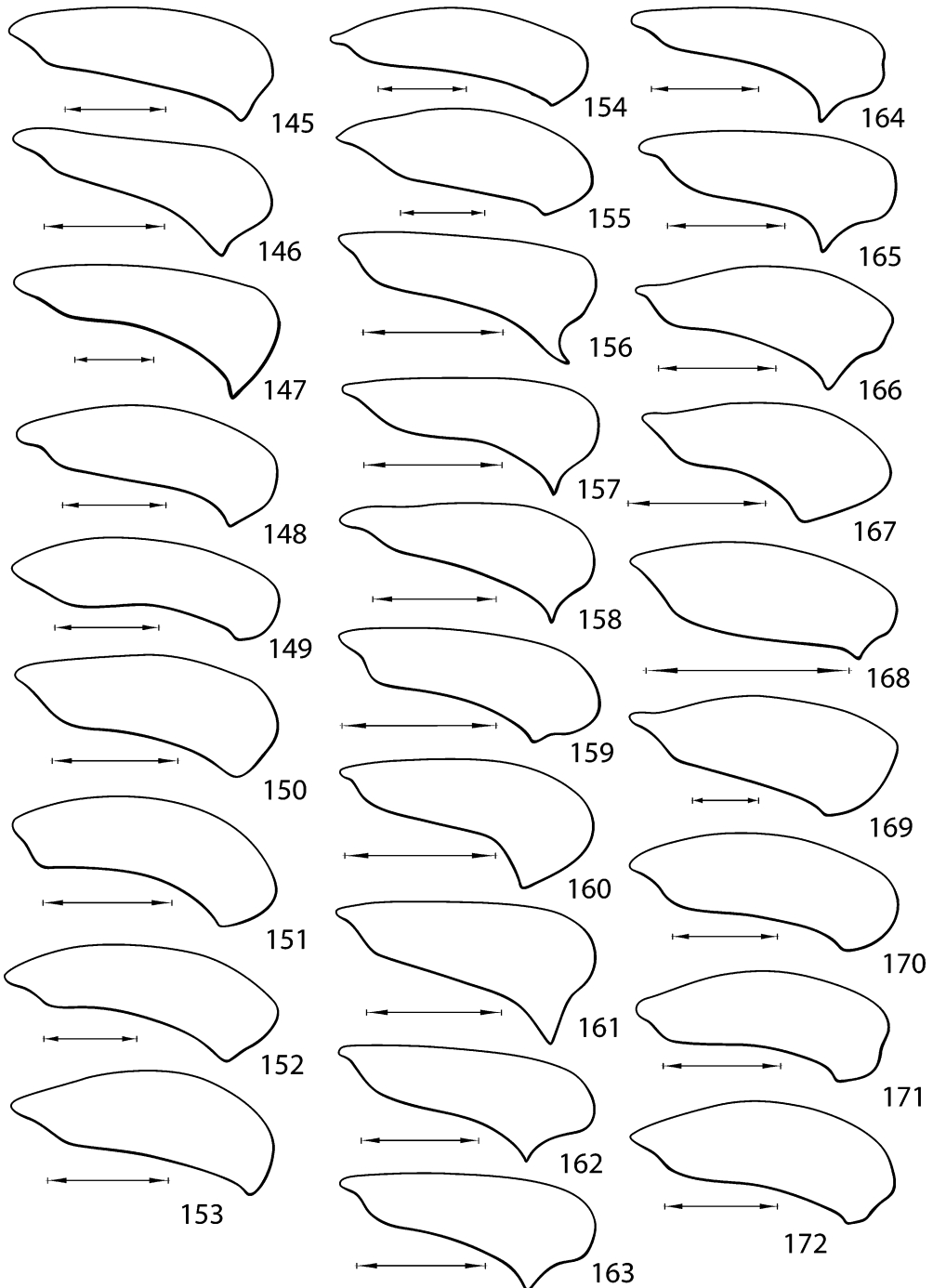


Figs. 113–117. *Agathidium oniscoides*-group species, sterna and legs: **113**, *A. gomezae*, metasternum, arrow indicating medial metasternal lobe. **114**, *A. skoliosternum*, mesosternum, arrow indicating anterior excavation of mesosternal margin. **115**, *A. tribulosum*, ♂ left proleg, arrow indicating spine on ♂ left protochanter. **116**, *A. tribulograndum*, ♂ left proleg, arrow indicating spine on ♂ left procoxa. **117**, *A. framea*, ♂ left metaleg, arrow indicating broad lobe along anterior margin of ♂ left metacoxa.

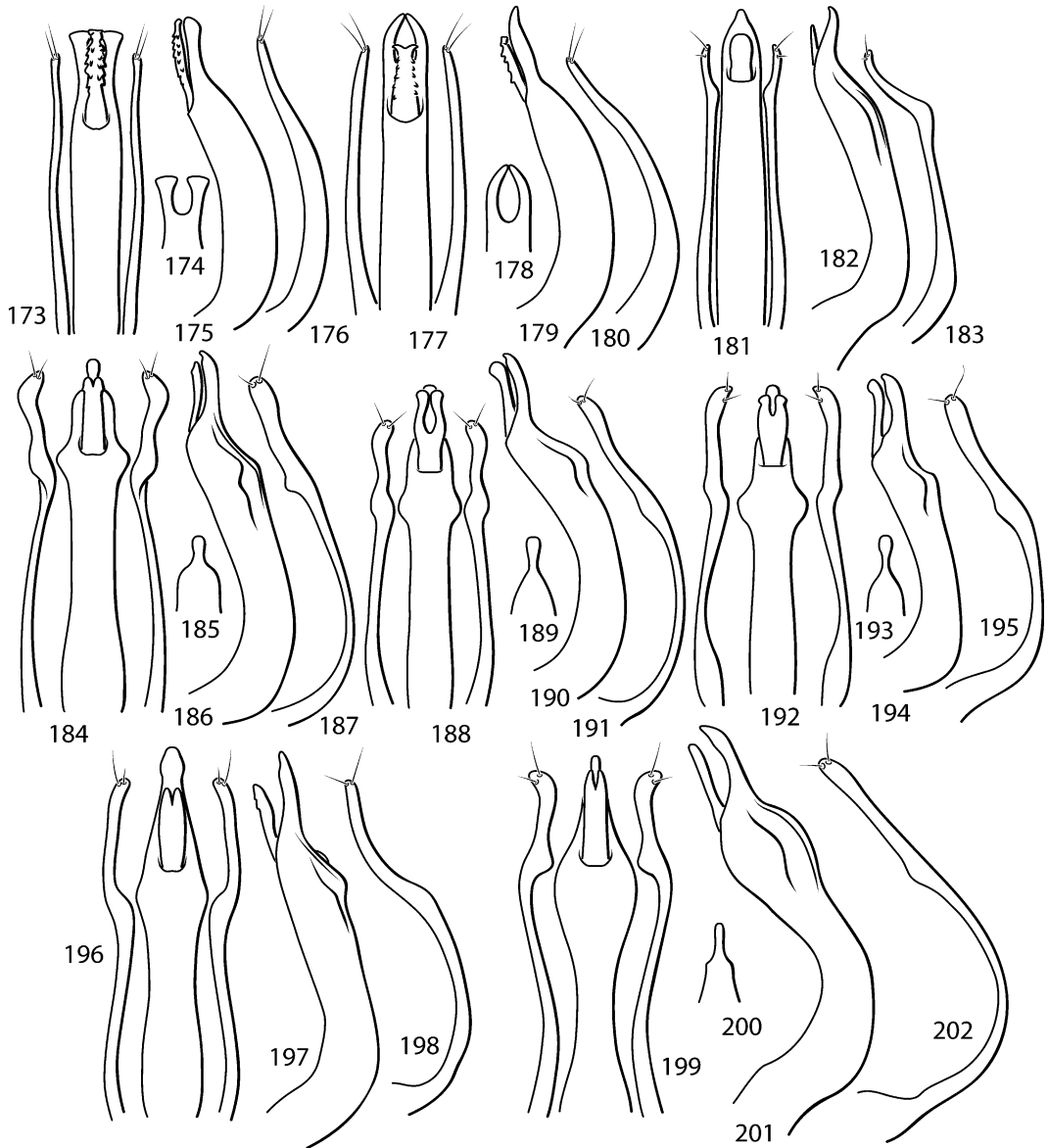
- duced (fig. 106)
- *A. vaderi*, new species
- Apical rami of median lobe of aedeagus apically slender, pointed, or narrowly rounded and slightly convergent (fig. 177); operculum shorter, ending distinctly short of apex of median lobe of aedeagus (fig. 177); male metafemoral tooth smaller and metafemur narrower (fig. 119); eyes strongly reduced (fig. 107)
- *A. kimberlae*, new species
- 6(2) (*A. aztec* subgroup). Gula with two prominent tubercles, one on each side of midline; male metafemur with large, curved apical tooth (fig. 121)
- *A. bituberculum*, new species
- Gula without two tubercles or with only a single, medial tubercle; male metafemur various 7
- 7(6). Anteromedial margin of metasternum with a transverse line which forms a distinct posteriorly directed lobe medially on metasternal surface (fig. 113) 8
- Anteromedial margin of metasternum with transverse line straight medially, not forming a medial metasternal lobe . . 10
- 8(7). Operculum of median lobe of aedeagus shallowly emarginate apically (fig. 184) *A. oedema*, new species
- Operculum of median lobe of aedeagus very deeply emarginate apically (figs. 188, 192) 9
- 9(8). Lobe formed by sinuate line on metasternum swollen, forming a prominent tumidity; male metafemoral tooth broad, rounded, obsolete (fig. 123); apical portion of median lobe of aedeagus relatively narrow (fig. 189)
- *A. gomezae*, new species
- Lobe formed by sinuate line on metasternum not swollen, flattened; male metafemoral tooth small but distinct and acutely



Figs. 118–144. *Agathidium concinnum*- and *A. oniscoides*-group species, left male metafemur, ventral aspect: **118**, *A. concinnum*. **119**, *A. kimberlae*. **120**, *A. vaderi*. **121**, *A. bituberculum*. **122**, *A. oedema*. **123**, *A. gomezae*. **124**, *A. hidalgoense*. **125**, *A. skoliosternum*. **126**, *A. erythromelas*. **127**, *A. rhamphastes*. **128**, *A. megoniscoides*. **129**, *A. grunum*. **130**, *A. triangularum*. **131**, *A. lobosternum*. **132**, *A. potosii*. **133**, *A. popocatepetlae*. **134**, *A. hyle*. **135**, *A. stenomma*. **136**, *A. tribulosum*. **137**, *A. tribulograndum*. **138**, *A. invisitatum*. **139**, *A. multidentatum*. **140**, *A. sejunctum*. **141**, *A. grandidentatum*. **142**, *A. andersoni*. **143**, *A. disgregum*. **144**, *A. oaxacaense*. Bars = 0.5 mm.



Figs. 145–172. *Agathidium oniscoides*-group species, left male metafemur, ventral aspect: **145**, *A. oculeum*. **146**, *A. recurvatum*. **147**, *A. impensum*. **148**, *A. cheneyi*. **149**, *A. tenangoense*. **150**, *A. rumsfeldi*. **151**, *A. hirsutum*. **152**, *A. cortezi*. **153**, *A. tumidiventre*. **154**, *A. aztec*. **155**, *A. iridescens*. **156**, *A. dentigerum*. **157**, *A. stephani*. **158**, *A. akrogeneios*. **159**, *A. appalachium*. **160**, *A. pocahontasae*. **161**, *A. carolinense*. **162**, *A. gallititillo*. **163**, *A. divaricatum*. **164**, *A. bushi*. **165**, *A. georgiaense*. **166**, *A. chauliodoum*. **167**, *A. microphthalmum*. **168**, *A. nimbosilva*. **169**, *A. oniscoides*. **170**, *A. rubellum*. **171**, *A. exiguum*. **172**, *A. fawcettae*. Bars = 0.5 mm.



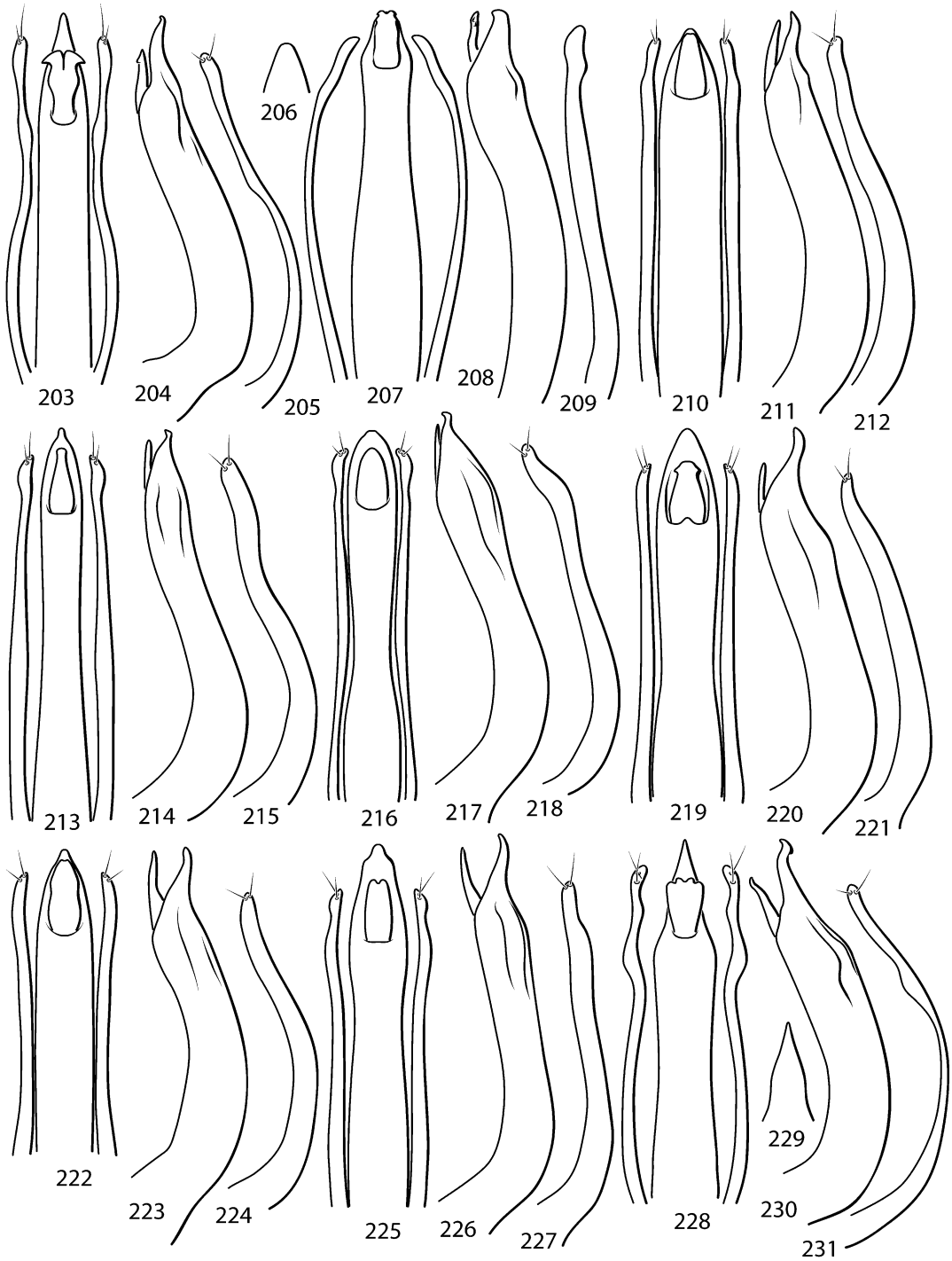
Figs. 173–202. *Agathidium oniscoides*-group species, aedeagus: 173–176, *A. vaderi*: **173**, ventral; **174**, median lobe, apex, ventral; **175**, median lobe, lateral; **176**, left lateral lobe, lateral. 177–180, *A. kimberlae*: **177**, ventral; **178**, median lobe, apex, ventral; **179**, median lobe, lateral; **180**, left lateral lobe, lateral. 181–183, *A. bituberculum*: **181**, ventral; **182**, median lobe, lateral; **183**, left lateral lobe, lateral. 184–187, *A. oedema*: **184**, ventral; **185**, median lobe, apex, ventral; **186**, median lobe, lateral; **187**, left lateral lobe, lateral. 188–191, *A. gomezae*: **188**, ventral; **189**, median lobe, apex, ventral; **190**, median lobe, lateral; **191**, left lateral lobe, lateral. 192–195, *A. hidalgoense*: **192**, ventral; **193**, median lobe, apex, ventral; **194**, median lobe, lateral; **195**, left lateral lobe, lateral. 196–198, *A. skoliosternum*: **196**, ventral; **197**, median lobe, lateral; **198**, left lateral lobe, lateral. 199–202, *A. erythromelas*: **199**, ventral; **200**, median lobe, apex, ventral; **201**, median lobe, lateral; **202**, left lateral lobe, lateral.

- pointed (fig. 124); apical portion of median lobe of aedeagus relatively broad (fig. 193) *A. hidalgoense*, new species
- 10(7). Anterior margin of mesosternum deeply emarginate on each side of midline (fig. 114) ... *A. skoliosternum*, new species
- Anterior margin of mesosternum not deeply emarginate on each side of midline 11
- 11(10). Head and pronotum red, elytra black; eyes relatively large and finely faceted; male metafemoral tooth small, antepical (fig. 126); median lobe of aedeagus in lateral aspect slender and strongly curved medially, strongly expanded along dorsal and ventral margins at base of apical portion (fig. 200) *A. erythromelas*, new species
- Head and pronotum concolorous brown to piceous; eyes various, male metafemoral tooth, and median lobe of aedeagus various 12
- 12(11). With prominent flat, triangular process extending anteriorly from labium; dorsal surfaces with distinct microreticulation between punctures consisting of small, isodiametric cells *A. rhamphastes*, new species
- Without process extending from labium; dorsal surfaces without microreticulation, smooth between punctures .. 13
- 13(12). Median lobe of aedeagus with lateral and dorsal carinae and sulcus for reception of lateral lobes weakly developed, indistinct 14
- Median lobe of aedeagus with lateral and dorsal carinae and sulcus for reception of lateral lobes strongly developed, carinae prominently protruding dorsally and/or laterally 20
- 14(13). Size very large (TBL > 4.0 mm) ; median lobe of aedeagus long, relatively straight, apical portion short, apically rounded (fig. 207), operculum extending to apex of median lobe of aedeagus, with two lateral teeth on each side of apex (fig. 207) *A. megonisoides*, new species
- Size smaller (TBL < 4.0 mm) ; median lobe of aedeagus not so long and straight, apical portion longer, lateral sulcus more strongly developed, operculum generally not extending to apex of median lobe of aedeagus 15
- 15(14). With prominent tumidity or prominence on gula 16
- With gula unmodified 18
- 16(15). Male metafemoral tooth large and acutely pointed (fig. 129); gula with prominent medial tumidity; apex of median lobe of aedeagus in lateral aspect with apically gently curved (fig. 211) *A. grumum*, new species
- Male metafemoral tooth smaller, less prominent; gula with prominent tumidity near anterior margin; apex of median lobe of aedeagus in lateral aspect with apex abruptly hooked 17
- 17(16). Operculum of median lobe of aedeagus relatively slender, subapically narrowed (fig. 213) *A. triangularum*, new species
- Operculum of median lobe of aedeagus relatively broadly rounded, margins evenly curved to apex (fig. 216) *A. lobosternum*, new species
- 18(15). Operculum of median lobe of aedeagus apically laterally expanded with lateral teeth (fig. 219) *A. potosii*, new species
- Operculum of median lobe of aedeagus not apically laterally expanded with teeth 19
- 19(18). Male metafemoral tooth located about two-thirds distance from base of metafemur (fig. 133); apex of operculum of median lobe of aedeagus rounded, very slightly emarginate (fig. 222) ... *A. popocatepetlae*, new species
- Male metafemoral tooth located subapically (fig. 134); apex of operculum of median lobe of aedeagus more strongly emarginate (fig. 225) *A. hyle*, new species
- 20(13). Eyes very strongly dorsoventrally compressed to long, slender lines (fig. 109); median lobe of aedeagus distinctly recurved in lateral aspect (fig. 230) *A. stenomma*, new species
- Eyes variously reduced, but not so strongly compressed to long, slender lines; median lobe of aedeagus recurved or not in lateral aspect ... 21
- 21(20). Male protrochanter with distinct, prolonged, slender, flattened spine (fig. 115); metatrochanter concave with apex produced ventrally as short, prominent tubercle; median lobe of aedeagus with apical portion long and sharply recurved in lateral aspect, slightly bent, twisted, and asymmetrical (figs. 232, 233) *A. tribulosum*, new species
- Male protrochanter without a spine; metatrochanter not concave or with apex

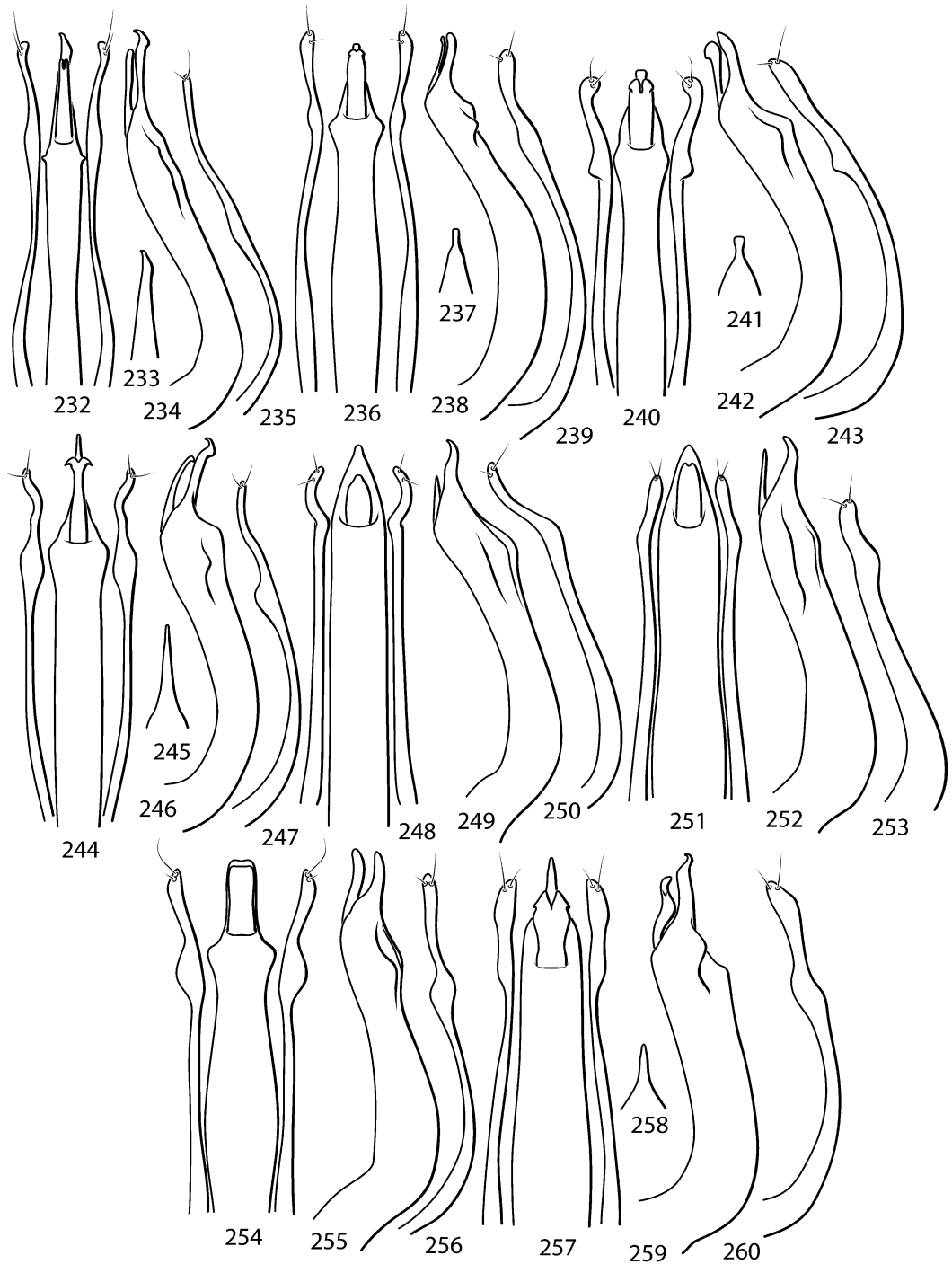
- produced; median lobe of aedeagus various in shape, but with apex symmetrical 22
- 22(21). Male procoxa produced into a very broad, flat, ventral tooth (fig. 116); male metafemur with two moderate-sized teeth along posterior margin with broad, concave margin between them (fig. 137)
 *A. tribulograndum*, new species
- Male procoxa unmodified, not produced; male metafemur with teeth various, but not configured into two teeth with concave area between 23
- 23(22). Male with prominent series of four denticles on posterior margin of metafemur with largest about two-thirds distance from base of metafemur (fig. 138); operculum of median lobe of aedeagus long and broad, apically distinctly emarginate with each ramus apically expanded ventrad (fig. 240)
 *A. invisitatum*, new species
- Male with only a single metafemoral tooth or with multiple very small teeth; operculum of median lobe of aedeagus various 24
- 24(23). Male with posterior margin of metafemur with series of small but distinctive teeth (fig. 139); median lobe of aedeagus with apical portion very slender in ventral aspect, operculum long, slender, and apically with prominent lateral hooks (fig. 244)
 *A. multidentatum*, new species
- Male with posterior margin of metafemur without series of teeth, although margin has minute serrations in some species; median lobe of aedeagus not slender in ventral aspect and without long operculum bearing lateral hooks 25
- 25(24). Male metafemoral tooth very large, length greater than width, apex acutely pointed 26
- Male metafemoral tooth various, but not very large, length not greater than width and with apex acutely pointed 27
- 26(25). Size larger (TBL > 2.5 mm) ; mesosternal carina of most specimens with low, medial notch; median lobe of aedeagus with prominent, dorsal, lobelike carina with a large fovea along it into which fits the lateral lobes (figs. 248, 249)
 *A. sejunctum*, new species
- Size smaller (TBL < 2.5 mm) ; specimens without medial notch in mesosternal carina; median lobe of aedeagus with dorsal carina and fovea less well developed (figs. 251, 252)
 *A. grandidentatum*, new species
- 27(25). Operculum of median lobe of aedeagus extending to apex of median lobe, operculum and apical portion of median lobe similar in shape, each apically similarly truncate (figs. 254, 255)
 *A. andersoni*, new species
- Operculum of median lobe of aedeagus in most species not extending to apex of median lobe, operculum and median lobe different in shape and not both apically similarly truncate 28
- 28(27). Operculum of median lobe of aedeagus distinctly T-shaped with apicolateral, pointed projections (fig. 257); median lobe in lateral aspect with apex recurved (fig. 259)
 *A. disgregum*, new species
- Operculum of median lobe of aedeagus not T-shaped; median lobe in lateral aspect various 29
- 29(28). Median lobe of aedeagus in lateral aspect short, strongly curved, strongly expanded medially due to dorsal production of dorsomedial carina, with very large lateral fovea for reception of lateral lobe (fig. 262); male metafemoral tooth moderately large, anteapical and with series of smaller serrations along posterior margin of metafemur (fig. 144) *A. oaxacaense*, new species
- Median lobe of aedeagus in lateral aspect longer, not so strongly curved, not as strongly expanded medially; male metafemoral tooth various, some species with series of smaller serrations 30

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Figs. 203–231. *Agathidium oniscoides*-group species, aedeagus: 203–205, *A. rhamphastes*: **203**, ventral; **204**, median lobe, lateral; **205**, left lateral lobe, lateral. 206–209, *A. megoniscoides*: **206**, median lobe, apex, ventral; **207**, ventral; **208**, median lobe, lateral; **209**, left lateral lobe, lateral. 210–212, *A. grunum*: **210**, ventral; **211**, median lobe, lateral; **212**, left lateral lobe, lateral. 213–215, *A. triangularum*: **213**, ventral; **214**, median lobe, lateral; **215**, left lateral lobe, lateral. 216–218, *A. lobosternum*: **216**, ventral; **217**, median lobe, lateral; **218**, left lateral lobe, lateral. 219–221, *A. potosii*: **219**, ventral; **220**,



median lobe, lateral; **221**, left lateral lobe, lateral. **222–224**, *A. popocatepetlae*: **222**, ventral; **223**, median lobe, lateral; **224**, left lateral lobe, lateral. **225–227**, *A. hyle*: **225**, ventral; **226**, median lobe, lateral; **227**, left lateral lobe, lateral. **228–231**, *A. stenomma*: **228**, ventral; **229**, median lobe, apex, ventral; **230**, median lobe, lateral; **231**, left lateral lobe, lateral.

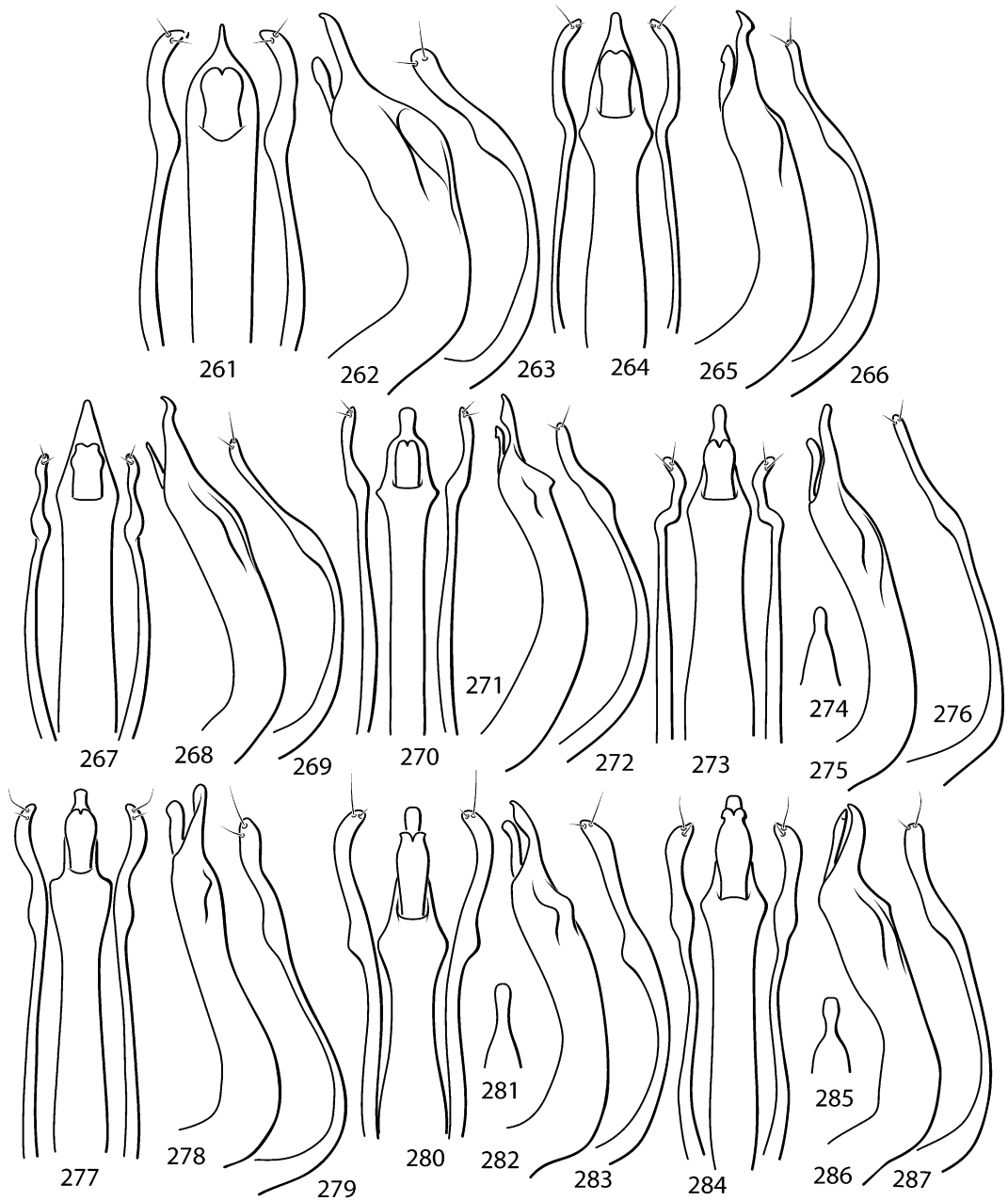


Figs. 232–260. *Agathidium oniscoides*-group species, aedeagus: 232–235, *A. tribulosum*: **232**, ventral; **233**, median lobe, apex, ventral; **234**, median lobe, lateral; **235**, left lateral lobe, lateral. 236–239, *A. tribulograndum*: **236**, ventral; **237**, median lobe, apex, ventral; **238**, median lobe, lateral; **239**, left lateral lobe, lateral. 240–243, *A. invisitatum*: **240**, ventral; **241**, median lobe, apex, ventral; **242**, median lobe, lateral; **243**, left lateral lobe, lateral. 244–247, *A. multidentatum*: **244**, ventral; **245**, median lobe,

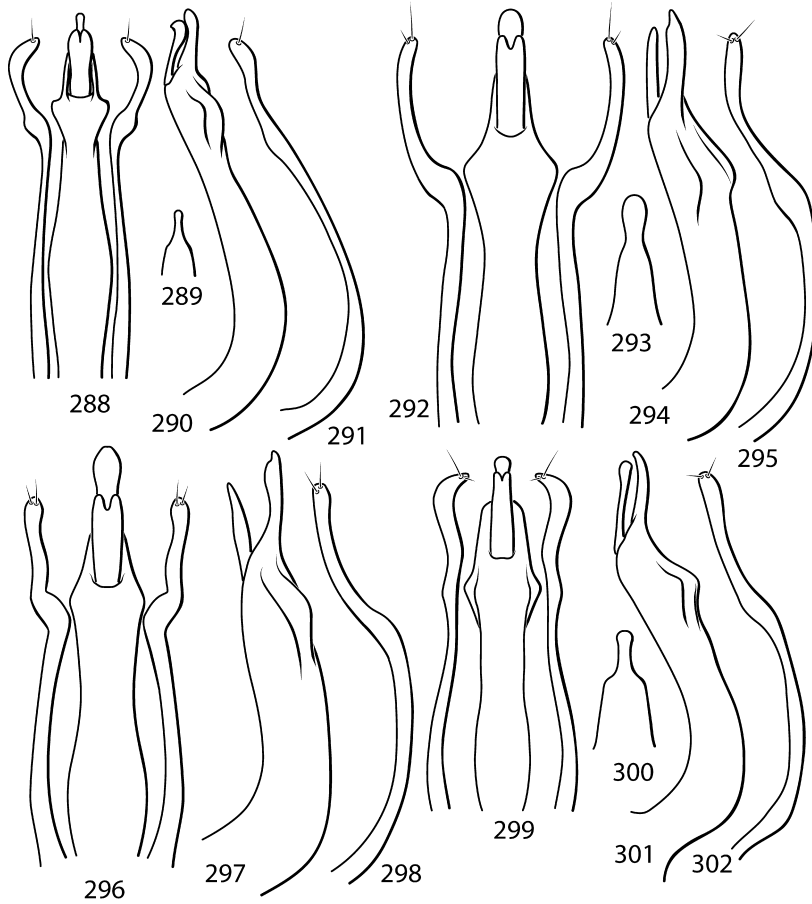
- 30(29). Apex of median lobe of aedeagus distinctly recurved in lateral aspect, apically pointed and abruptly hooked ventrad 31
- Apex of median lobe of aedeagus not distinctly recurved in lateral aspect, apically straight or evenly curved and in some species angled dorsad or ventrad 32
- 31(30). Operculum of median lobe of aedeagus short, narrow basally, apically relatively broadly expanded and emarginate with each ramus broad and apically pointed (fig. 264); eyes prominent and multifaceted (fig. 108) *A. oculateum*, new species
- Operculum of median lobe of aedeagus long, relatively slender, apex emarginate with each ramus narrowly rounded apically (fig. 267); eyes dorsoventrally compressed, reduced *A. recurvatum*, new species
- 32(31). Operculum of median lobe of aedeagus relatively short and broad, length about 2× greatest width 33
- Operculum of male long and slender, about 2.5–4× greatest width 35
- 33(32). Size large (TBL > 4.0 mm); apical portion of median lobe of aedeagus expanded medially along ventral margin in lateral aspect (fig. 272) *A. impensum*, new species
- Size smaller (TBL < 4.0 mm); apical portion of median lobe of aedeagus not expanded in lateral aspect 34
- 34(33). Apex of median lobe of aedeagus in lateral aspect slender, curved slightly dorsad, apex narrowly rounded (fig. 275) *A. cheneyi*, new species
- Apex of median lobe of aedeagus in lateral aspect broad, not curved dorsad, apex broadly rounded (fig. 278) *A. tenangoense*, new species
- 35(32). Apex of operculum of median lobe of aedeagus in ventral aspect with apex laterally flared into relatively prominent, pointed processes 36
- Apex of operculum of median lobe of aedeagus in ventral aspect with apex with lateral margins not flared or produced 37
- 36(35). Apex of median lobe of aedeagus in lateral aspect distinctly expanded medially along ventral margin (fig. 282); operculum in lateral aspect apically curved ventrad, expanded apically (fig. 282) *A. rumsfeldi*, new species
- Apex of median lobe of aedeagus in lateral aspect evenly narrowed to pointed apex (fig. 286); operculum in lateral aspect straight to narrowly rounded apex (fig. 286) *A. hirsutum*, new species
- 37(35). Apex of operculum of median lobe of aedeagus in lateral aspect broad and hooked dorsad (fig. 290); apex of median lobe in ventral aspect very narrow, straight, apically very narrowly rounded (fig. 289) *A. cortezi*, new species
- Apex of operculum of median lobe of aedeagus in lateral aspect apically not broad, not hooked dorsad; apex of median lobe in ventral aspect not as strongly narrowed, apically broadly rounded 38
- 38(37). Gula medially with a broad, prominent tumidity *A. tumidiventre*, new species
- Gula unmodified 39
- 39(38). Apical portion of median lobe of aedeagus in lateral aspect expanded along ventral margin (fig. 297); operculum of median lobe shorter and slightly broader, ending distinctly short of apex of median lobe (fig. 296) *A. aztec*, new species
- Apical portion of median lobe of aedeagus in lateral aspect not expanded along ventral margin (fig. 301); operculum of median lobe longer and more slender, extending nearly to apex of median lobe (fig. 299) *A. iridescens*, new species
- 40(3) (*A. dentigerum* subgroup). Gula with small but prominent medial lobe on gula 41
- Gula unmodified, without medial lobe 43

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apex, ventral; **246**, median lobe, lateral; **247**, left lateral lobe, lateral. 248–250, *A. sejunctum*: **248**, ventral; **249**, median lobe, lateral; **250**, left lateral lobe, lateral. 251–253, *A. grandidentatum*: **251**, ventral; **252**, median lobe, lateral; **253**, left lateral lobe, lateral. 254–256, *A. andersoni*: **254**, ventral; **255**, median lobe, lateral; **256**, left lateral lobe, lateral. 257–260, *A. disgregum*: **257**, ventral; **258**, median lobe, apex, ventral; **259**, median lobe, lateral; **260**, left lateral lobe, lateral.

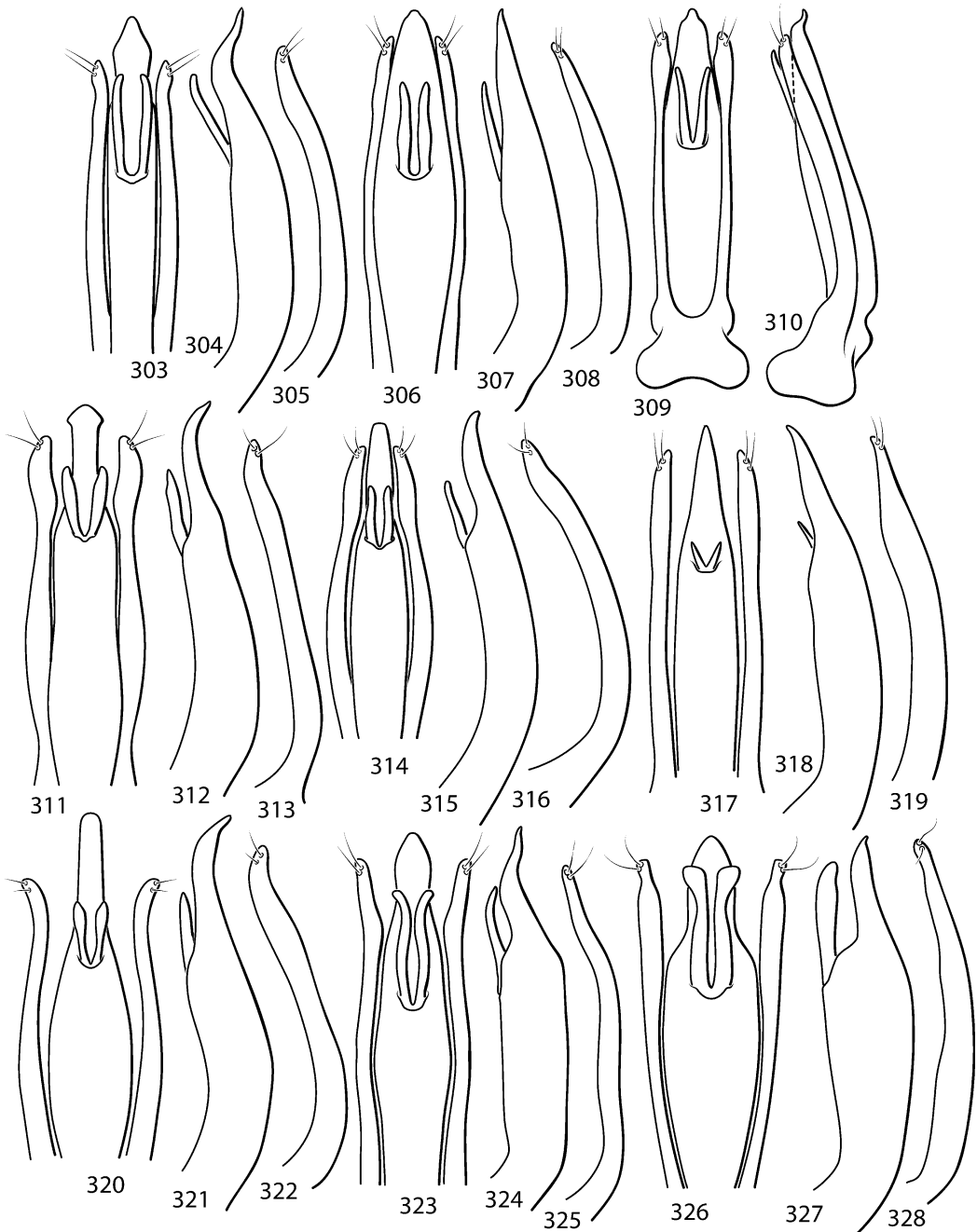


Figs. 261–287. *Agathidium oniscoides*-group species, aedeagus: 261–263, *A. oaxacaense*: **261**, ventral; **262**, median lobe, lateral; **263**, left lateral lobe, lateral. 264–266, *A. oculum*: **264**, ventral; **265**, median lobe, lateral; **266**, left lateral lobe, lateral. 267–269, *A. recurvatum*: **267**, ventral; **268**, median lobe, lateral; **269**, left lateral lobe, lateral. 270–272, *A. impensum*: **270**, ventral; **271**, median lobe, lateral; **272**, left lateral lobe, lateral. 273–276, *A. cheneyi*: **273**, ventral; **274**, median lobe, apex, ventral; **275**, median lobe, lateral; **276**, left lateral lobe, lateral. 277–279, *A. tenangoense*: **277**, ventral; **278**, median lobe, lateral; **279**, left lateral lobe, lateral. 280–283, *A. rumsfeldi*: **280**, ventral; **281**, median lobe, apex, ventral; **282**, median lobe, lateral; **283**, left lateral lobe, lateral. 284–287, *A. hirsutum*: **284**, ventral; **285**, median lobe, apex, ventral; **286**, median lobe, lateral; **287**, left lateral lobe, lateral.



Figs. 288–302. *Agathidium oniscoides*-group species, aedeagus: 288–291, *A. cortezi*: **288**, ventral; **289**, median lobe, apex, ventral; **290**, median lobe, lateral; **291**, left lateral lobe, lateral. 292–295, *A. tumidiventre*: **292**, ventral; **293**, median lobe, apex, ventral; **294**, median lobe, lateral; **295**, left lateral lobe, lateral. 296–298, *A. aztec*: **296**, ventral; **297**, median lobe, lateral; **298**, left lateral lobe, lateral. 299–302, *A. iridescens*: **299**, ventral; **300**, median lobe, apex, ventral; **301**, median lobe, lateral; **302**, left lateral lobe, lateral.

- 41(40). Apical portion of median lobe of aedeagus strongly and broadly sinuate in lateral aspect (fig. 305)
- *A. dentigerum* Horn
- Apical portion of median lobe of aedeagus straight or with only apex of median lobe abruptly sinuate in lateral aspect 42
- 42(41). Apical portion of median lobe of aedeagus straight to apex in lateral aspect (fig. 308) *A. stephani*, new species
- Apical portion of median lobe of aedeagus with apex abruptly sinuate in lateral aspect (fig. 310)
- *A. akrogeneios*, new species
- 43(42). Posteromedial margin of male metacoxa with broad, rounded, prominent lobe (fig. 117); apical portion of median lobe of aedeagus in lateral aspect strongly curved dorsad (fig. 312), in ventral aspect with apex distinctly arrowhead-shaped (fig. 311)
- *A. framea*, new species
- Posteromedial margin of male metacoxa not modified; apical portion of median lobe of aedeagus variously curved or straight in lateral aspect, in ventral aspect not arrowhead-shaped 44
- 44(43). Size very small (TBL < 2.2 mm) ; median lobe of aedeagus with operculum



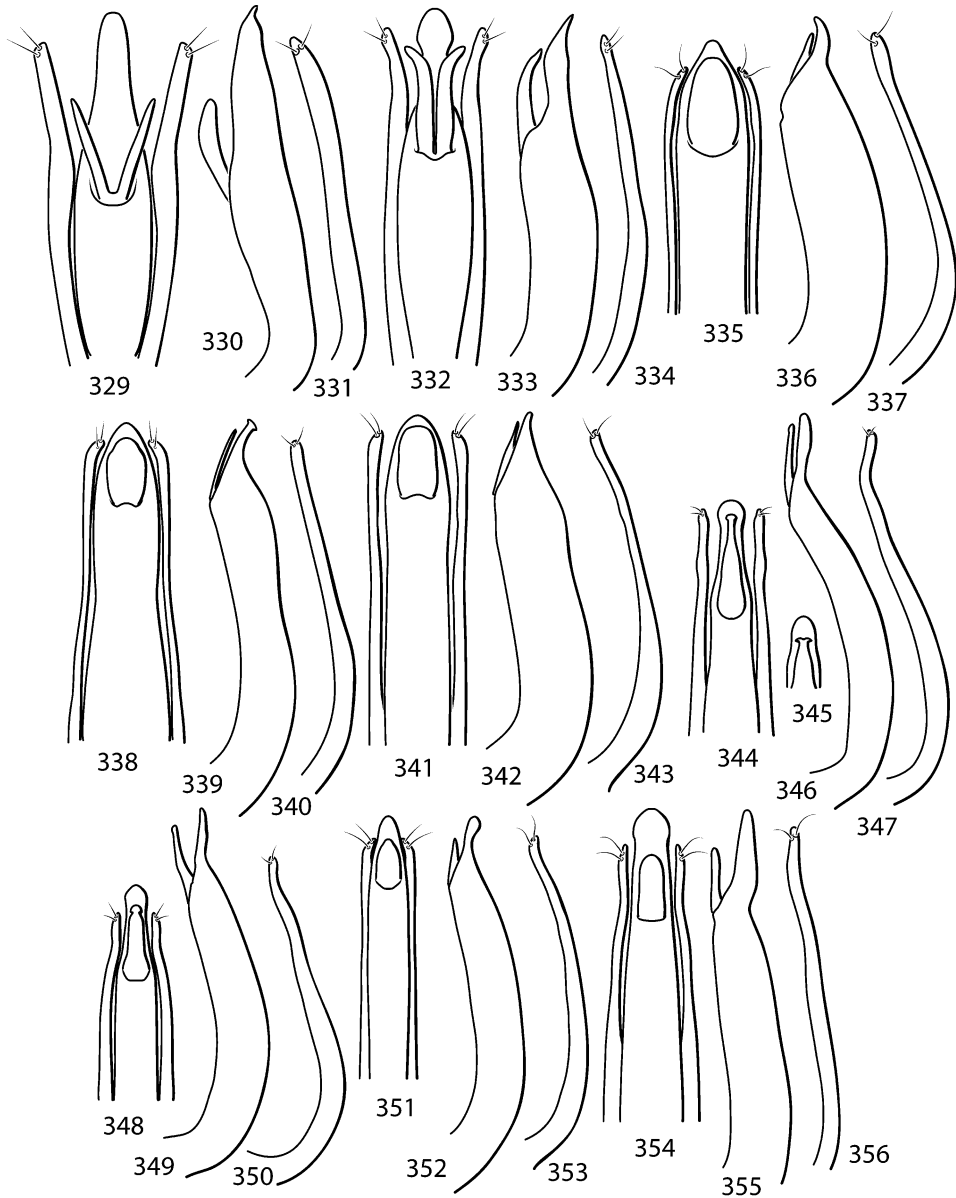
Figs. 303–328. *Agathidium oniscoides*-group species, aedeagus: 303–305, *A. dentigerum*: **303**, ventral; **304**, median lobe, lateral; **305**, left lateral lobe, lateral. 306–308, *A. stephani*: **306**, ventral; **307**, median lobe, lateral; **308**, left lateral lobe, lateral. 309–310, *A. akrogeios*: **309**, ventral; **310**, lateral. 311–313, *A. framea*: **311**, ventral; **312**, median lobe, lateral; **313**, left lateral lobe, lateral. 314–316, *A. appalachium*: **314**, ventral; **315**, median lobe, lateral; **316**, left lateral lobe, lateral. 317–319, *A. pocahontasae*: **317**, ventral; **318**, median lobe, lateral; **319**, left lateral lobe, lateral. 320–322, *A. carolinense*: **320**, ventral; **321**, median lobe, lateral; **322**, left lateral lobe, lateral. 323–325, *A. gallititillo*: **323**, ventral; **324**, median lobe, lateral; **325**, left lateral lobe, lateral. 326–328, *A. divaricatum*: **326**, ventral; **327**, median lobe, lateral; **328**, left lateral lobe, lateral.

- very short, with rami straight and not apically expanded (figs. 314, 317) 45
- Size larger (TBL > 2.2 mm) ; median lobe of aedeagus with operculum longer, rami of some species apically expanded 46
- 45(44). Apex of median lobe of aedeagus curved dorsad in lateral aspect (fig. 315), in ventral aspect apically truncate (fig. 314) . . . *A. appalachium*, new species
- Apex of median lobe of aedeagus straight in lateral aspect (fig. 318), in ventral aspect apically pointed (fig. 317) 46
- 46(44). Apical portion of median lobe of aedeagus in lateral aspect strongly curved dorsad (fig. 321), in ventral aspect slender and evenly tapered to narrowly rounded apex (fig. 320) 46
- Apical portion of median lobe of aedeagus in lateral aspect not strongly curved dorsad, in ventral aspect various, generally somewhat expanded medially, but not evenly tapered to narrowly rounded apex 47
- 47(46). Median lobe of aedeagus in lateral aspect distinctly bent ventrad at base of apical portion (fig. 324) 47
- Median lobe of aedeagus in lateral aspect only slightly or not bent ventrad at base of apical portion 48
- 48(47). Apical portion of median lobe of aedeagus abruptly narrowed near base, lateral margins subparallel thereafter (fig. 326); rami of operculum apically expanded, rounded, and divergent, extending nearly to apex of median lobe (fig. 326) 48
- Apical portion of median lobe of aedeagus not abruptly narrowed near base in ventral aspect, lateral margins evenly convergent or slightly constricted basally, operculum not apically expanded, rounded, or divergent, not extending nearly to apex of median lobe 49
- 49(48). Apical portion of median lobe of aedeagus with margins evenly convergent to apex (fig. 329), in lateral aspect straight to apex (fig. 330) 49
- Apical portion of median lobe of aedeagus distinctly constricted near base (fig. 332), in lateral aspect distinctly curved

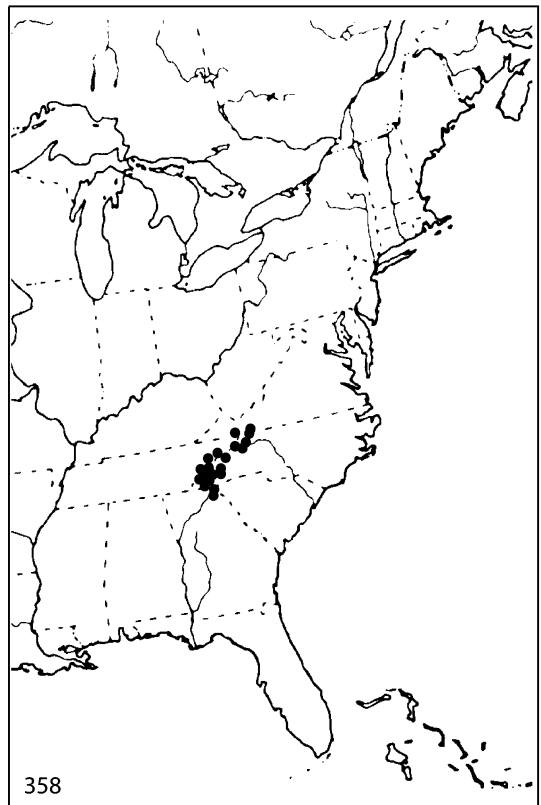
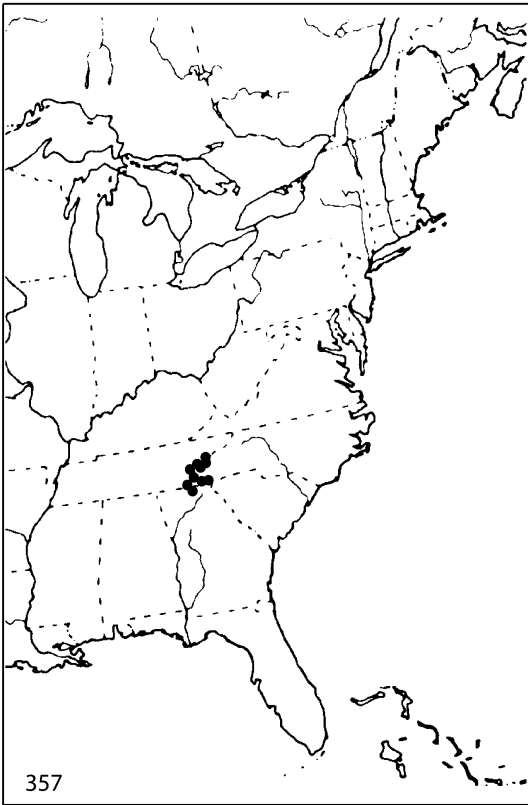
- dorsad at apex (fig. 333) 50(4)
- *A. georgiaense*, new species (*A. microphthalmum* subgroup). Eyes ovoid, dorsally directed (fig. 110); median lobe of aedeagus stout, apically abruptly curved and sharply pointed in ventral aspect (fig. 335) 51
- Eyes shaped like elongate triangles, more laterally directed (figs. 111, 112); median lobe of aedeagus various 51
- 51(50). Median lobe of aedeagus with apex abruptly expanded and truncate (fig. 338) 51
- Median lobe of aedeagus with apex pointed, not expanded (fig. 341) 52(4)
- (*A. oniscoides* subgroup). Median lobe of aedeagus with operculum long, slender, evenly tapered, with apex laterally expanded 53
- Median lobe of aedeagus with operculum shorter and broader, apex not expanded in most species 54
- 53(52). Size generally larger (TBL = 2.5–5.0 mm) ; dorsal surfaces black; metasternal fovea moderately large and conspicuous 53
- . . . *A. oniscoides* Palisot de Beauvois
- Size smaller (TBL = 2.2–2.9 mm) ; dorsal surfaces red; metasternal fovea minute, inconspicuous 54
- *A. rubellum* Fall
- 54(52). Lateral lobe with apical portion directed at angle dorsad in lateral aspect with subapical expansion on dorsal margin (fig. 352) . . . *A. exiguum* Melsheimer
- Lateral lobe with apical portion various but without subapical dorsal expansion in lateral aspect (fig. 355) 54
- *A. fawcettae*, new species

Agathidium kimberlae Subgroup

DISCUSSION: This group of two species is united by the median lobe of aedeagus apically bifid (figs. 174, 178) and with the operculum strongly toothed (figs. 173, 177). In addition, the eyes are strongly reduced (figs. 106, 107), and the two share a similar habitus since they are moderately elongate with a large, protruding pronotum and strong contractility. The male metafemora are very broad (figs. 119, 120). The two species occur sympatrically in a portion of the southern



Figs. 329–356. *Agathidium oniscoides*-group species, aedeagus: 329–313, *A. bushi*: **329**, ventral; **330**, median lobe, lateral; **331**, left lateral lobe, lateral. 332–334, *A. georgiaense*: **332**, ventral; **333**, median lobe, lateral; **334**, left lateral lobe, lateral. 335–337, *A. chaulioudoum*: **335**, ventral; **336**, median lobe, lateral; **337**, left lateral lobe, lateral. 338–340, *A. microphthalmum*: **338**, ventral; **339**, median lobe, lateral; **340**, left lateral lobe, lateral. 341–343, *A. nimbosilva*: **341**, ventral; **342**, median lobe, lateral; **343**, left lateral lobe, lateral. 344–347, *A. oniscoides*: **344**, ventral; **345**, apex of median lobe, ventral, specimen from Macon City, NC; **346**, median lobe, lateral; **347**, left lateral lobe, lateral. 348–350, *A. rubellum*: **348**, ventral; **349**, median lobe, lateral; **350**, left lateral lobe, lateral. 351–353, *A. exiguum*: **351**, ventral; **352**, median lobe, lateral; **353**, left lateral lobe, lateral. 354–356, *A. fawcettae*: **354**, ventral; **355**, median lobe, lateral; **356**, left lateral lobe, lateral.



Figs. 357, 358. Geographic distribution of *Agathidium oniscoides*-group species: **357**, *A. vaderi*. **358**, *A. kimberlae*.

Appalachians where they are commonly collected from forest litter.

Agathidium vaderi Miller and Wheeler,
new species

Frontispiece, figures 106, 120, 173–176,
357

TYPE MATERIAL: Holotype, ♂ in AMNH labeled “NC/TN: Clingman’s Dome Gr. Smoky Mtn. Nat. Park 18.viii.81 sift. decaying wood Q. Wheeler #81343/HOLOTYPE *Agathidium vaderi* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: United States, North Carolina, Great Smoky Mountains National Park, Clingman’s Dome.

DIAGNOSIS: This species is distinguishable from most by the elongate form of the body combined with highly reduced eyes consisting of small, elongate triangles (frontispiece,

fig. 106) and by the median lobe of the aedeagus being apically deeply emarginate (fig. 174). *Agathidium vaderi* is most similar to *A. kimberlae* from which it differs in having the apical rami of the median lobe broad, apically truncate, and with the apices straight (fig. 174), whereas in *A. kimberlae* the rami are narrow, apically narrowly rounded, and with the apices convergent (fig. 178). The operculum in *A. kimberlae* is apically more broadly expanded, shorter (ending far short of apex of median lobe), and bears fewer teeth in general (fig. 177), whereas in *A. vaderi* the operculum extends nearly to the apex of the median lobe and is heavily toothed (fig. 173). The metafemur is slightly narrower (fig. 119), and the eyes are slightly larger (fig. 107) in *A. kimberlae* than in *A. vaderi* (figs. 106, 120).

DESCRIPTION: Body moderately large (TBL

= 2.59–3.24 mm), oblong (PNW/TBL = 0.38–0.45), strongly contractile.

Head piceous to reddish-brown; pronotum piceous to reddish-brown, lighter reddish along posterior margin; elytra piceous to reddish-brown, lighter apically; venter brown to yellow-brown; antennae and palpi yellow to yellow-brown; legs yellow-brown.

Head broad (MDL/OHW = 0.53–0.78), dorsoventrally conspicuously compressed, laterally with distinct bead, tentorium laterally protuberant; with few, sparse, fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eye strongly reduced to an elongate triangle (fig. 106); gula concave; antennomere ratios: length I:II:III = 2.0:1.0:1.7, width VII:VIII:IX = 1.0:1.0:1.5. Pronotum very large, broad (PNL/PNW = 0.72–0.92), strongly convex, extending anteromedially over head, posterior margin weakly bisinuate, lateral margin broadly curved, not angulate; with few, fine, scattered punctures, surface between punctures shiny, smooth. Elytra broad, convex, apically not strongly attenuate, elongate (SEL/ELW = 0.96–1.17); with very few fine, scattered punctures, surface between punctures shiny, smooth; without sutural stria. Flight wings absent. Mesosternum broad, medially with distinct longitudinal carina. Metasternum moderately broad, not reduced (MTL/MTW = 0.17–0.26); oblique femoral lines weakly present, meeting medially in low line.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with large ventral field of spatulate setae; mandibles not modified; metafemur very broad, posteroapical angle broadly triangular and strongly produced in large, flat tooth, apical margin strongly curved (fig. 120); metasternal fovea present, medial, circular and small with dense pencil of fine setae. Median lobe in lateral aspect moderately curved, apical portion straight and with margins approximately parallel, apex narrowly rounded (fig. 175); in ventral aspect slender, apically bifurcate, rami somewhat divergent, each ramus apically expanded and broadly truncate, medial emargination moderately broad (figs. 173, 174); operculum long, extending to or nearly to apex of median lobe, with conspicuous and strong lateral dentation along entire

length, apex abruptly laterally expanded, curved toward apex of median lobe, extending nearly to apex of median lobe (fig. 173); lateral lobes slender, long, apically narrowly rounded with two long setae (fig. 176).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for the fictional villain Darth Vader in the movie "Star Wars", who shares with *A. vaderi* a broad, shiny, helmetlike head.

DISTRIBUTION: This species is known from mountainous areas of North Carolina, Tennessee, and Georgia (fig. 357).

PARATYPES: UNITED STATES: *Georgia*: White-Union Co.: Tesnatee Gap, 20 Jul 1967, 3100', log litter, Berlese, S Peck, A Fiske (13, PECK); Tesnatee Gap, 20 Jul 1967, log litter, Berlese, S Peck, A Fiske (1, CNCI). *North Carolina*: Clingman's Dome, Great Smoky Mts Natl Park, 18 Aug 1981, decaying wood, Q Wheeler (1, QDWC); Highlands, Jun 1888 (1, MCZC); Cherokee Co.: Joanna Bald, 26 Jul 1967, 4700', log litter, Berlese, S Peck, A Fiske (2, CNCI); Macon Co.: 5 mi NW Highlands, California Gap, 3000–3500', leaf litter, *Rhododendron*, Q Wheeler (1, QDWC); Wayah Bald, 5 Jun 1981, hardwood litter, Q Wheeler (1, QDWC); Highlands, Jul, QD Wheeler (1, QDWC); Swain Co.: Great Smoky Mts Natl Park, Flat Creek Trail, 83°10'21"W, 35°33'1"N, 31 Jul 2001, 1500 m, leaf litter, Berlese, C Carlton (8, LSAM). *Tennessee*: Great Smoky Mts P.P., 19 Jun 1981, Q Wheeler (1, QDWC); Great Smoky Mts NP, 19 Jun 1981, leaf litter, Q Wheeler (1, QDWC); Blount Co.: Great Smoky Mts Natl Park, Cades Cove, 8 Jun 1960, 1700', wet leaf duff, J Wagner, W Suter (4, FMNH); Cocke Co.: Great Smoky Mts Natl Park, Albright Grove Trail, 83°16'45"W, 35°44'10"N, 29 Jun 2001, 1000 m, old growth, Berlese, C Carlton (1, LSAM); Sevier Co.: Great Smoky Mts Natl Park, Newfound Gap, 16 Sep 1949, J Wagner, W Suter (3, FMNH); Great Smoky Mts Natl Park, EElkmont, 8 Jun 1960, 2250', leaf duff, W Suter, J Wagner (5, FMNH); Appalachian Trail at beech Gap on Clingman's Dome Rd, 83°26'50"W, 35°36'36"N, 28 Jun 2001, 1750 m, forest litter, Berlese, A Tischckhin, V Moseley (3, LSAM); Great Smoky Mts Natl Park, 0.5 km NE Newfound Gap, 82°24'46"W, 35°38'9"N, 26 Jun 2001, CE Carlton (7, LSAM).

DISCUSSION: This species has been collected mainly from log and leaf litter (particularly *Rhododendron* litter). Altitude records are from 1700 to 4700 ft.

Agathidium kimberlae Miller and Wheeler,
new species
Figures 107, 119, 177–180, 358

TYPE MATERIAL: Holotype, ♂ in AMNH labeled “NC: Macon Co. Highlands, 2 mi NW Nantahala NF 7.VIII.81/ex. leaf litter Q.D.Wheeler Lot. #81231 J. Pakaluk, Q.Wheeler/HOLOTYPE *Agathidium kimberlae* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: United States, North Carolina, Macon Co., Nantahala National Forest, 2 mi NW Highlands.

DIAGNOSIS: This species is distinguishable from most by the elongate form of the body combined with highly reduced eyes consisting of small, elongate triangles (fig. 107) and by the median lobe of the aedeagus being apically deeply emarginate (fig. 178). *Agathidium kimberlae* is most similar to *A. vaderi*. See the diagnosis of that species for characters to separate the two species.

DESCRIPTION: Body moderately small (TBL = 2.38–3.04 mm), broad, oblong (PNW/TBL = 0.40–0.47), strongly contractile.

Head reddish-brown; pronotum reddish-brown, lighter reddish along posterior margin; elytra reddish-brown, lighter apically; venter brown to yellow-brown; antennae and palpi yellow to yellow-brown; legs yellow-brown.

Head broad (MDL/OHW = 0.55–0.77), dorsoventrally conspicuously compressed, laterally with distinct bead, tentorium laterally protuberant; with few, sparse, fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eye strongly reduced to an elongate triangle (fig. 107); gula strongly concave; antennomere ratios: length I:II:III = 2.0:1.0:1.8, width VII:VIII:IX = 1.0:1.0:1.7. Pronotum very large, broad (PNL/PNW = 0.71–0.85), strongly convex, extending anteromedially over head, posterior margin weakly bisinuate, lateral margin broadly curved, not angulate; with few, fine, scattered punctures, surface between punctures shiny, smooth. Elytra broad, elongate, convex, apically not strongly attenuate (SEL/ELW = 1.08–1.31); with very few fine, scattered punctures, surface between punctures shiny, smooth; with-

out sutural stria. Flight wings reduced to absent. Mesosternum broad, medially with distinct longitudinal carina. Metasternum short (MTL/MTW = 0.13–0.19); oblique femoral lines weakly present, meeting medially in low line.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, with small field of ventral adhesive setae; mandibles not modified; metafemur broad, expanded anteriorly, posteroapical angle triangular and posteriorly produced into large, broad tooth, apical margin strongly curved (fig. 119); metasternal fovea present, very small to moderately large, medial, circular, and with dense pencil of fine setae. Median lobe in lateral aspect moderately curved, apical portion straight and with margins approximately parallel, apex narrowly rounded (fig. 179); in ventral aspect slender, apically bifurcate, rami slender, curved, convergent apically, apices very narrowly rounded, medial emargination moderately broad (figs. 177, 178); operculum moderately long, not extending to apex of median lobe, with conspicuous and strong lateral dentation along entire length, apex abruptly laterally expanded, curved toward apex of median lobe, ending distinctly before apex of median lobe (fig. 177); lateral lobes slender, long, apically narrowly rounded with two long setae (fig. 180).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named in honor of the junior author's former wife, Kimberly Jo Peters Wheeler, for her understanding and support of his taxonomic ways for a quarter century of marriage.

DISTRIBUTION: This species is found in the southern Appalachian Mountains of North Carolina, Georgia, Tennessee, and Virginia (fig. 358).

PARATYPES: UNITED STATES: *Georgia*: Clayton, 2000–3700' (2, CNCI); Rabun Co.: Rabun Bald, 2 Aug 1981, 4080', leaf litter, J Pakaluk (8, QDWC); Chatahoochee Natl Forest 10 mi NE Clayton, 12 Jun 1981, 2400', leaf litter, J Pakaluk (1, QDWC); Rabun Bald, 11 Aug 1981, 4000', hardwood leaf litter, J Pakaluk and Q Wheeler (1, QDWC); Rabun Bald, 25 Jun 1975, 4300', forest litter, JF Cornell (3, CUI); Rabun Bald, 2 Aug 1981, leaf litter, QD Wheeler (4, QDWC); Rabun Bald, 11 Aug 1981, 4000', leaf litter, Berlese, QD

- Wheeler (6, QDWC). *North Carolina*: Valley of Black Mts, 19 Aug 1906, W Beutenmuller (1, AMNH); Valley of Black Mts, 10 Sep 1906, W Beutenmuller (1, AMNH); Black Mts, Jul (1, MCZC); Valley of Black Mts, 10 Sep 1906, W Beutenmuller (1, AMNH); Glen Falls Area, 3 mi SW Highlands, 2 Sep 1967, 3200', deciduous duff, JM and BA Campbell (1, CNCI); Black Mts (3, AMNH); Black Mts, 11 May 1900 (7, AMNH); Smoky Mts, Bryson City, Deep Creek, 27 Aug 1939, 2000', Darlington (1, MCZC); Balsam, 7 Jul 1917 (1, QDWC); Mt Pisgah, 10 Sep 1934, Quirsfeld (3, MCZC); Mt Mitchell, 4000–6000' (1, QDWC); Mt Mitchell St Park, 5 Aug 1981, 5300', decaying logs, J Pakaluk, Q Wheeler (1, QDWC); Mt Mitchell St. Park, 5 Aug 1981, 5300', decaying logs, J Pakaluk and Q Wheeler (1, QDWC); Valley of Black Mts, 28 Jul 1906, W Beutenmuller (1, AMNH); Blue Ridge Parkway, 4 Jun 1984, 3385', QD Wheeler (2, QDWC); Alleghany Co.: Roaring Gap, Stone Mt St Park Road, 18 Aug 1981, 2000', leaf litter, S Peck (1, CNCI); mi 236.1 Blue Ridge Parkway, 23 Jul 1967, 3800', stump litter, S Peck, A Fiske (1, PECK); Avery Co.: Grandfather Mt Blue Ridge Parkway, mi 304, 17 Aug 1981, 4000', leaf litter, S Peck (15, CNCI); Linville Falls, Blue Ridge Parkway mi 327, 16 Aug 1981, 3500', *Rhododendron* litter, S Peck (1, PECK); Buncombe Co.: Blue Rd. Parkway Grey Beard Mtn View, 4 Jun 1986, 1700 m, A Smetana (1, CNCI); Caldwell Co.: 6.6 mi N Grandfather Mtn Rt 221, 4 Jun 1984, mixed *Rhododendron* hardwood litter, QD Wheeler (1, QDWC); 6.6 mi N Grandfather Mtn, 4 Jun 1984, mixed *Rhododendron* hardwood litter, decayed wood, B Linsay, D Peters, Q Wheeler (1, QDWC); Haywood Co.: Great Smoky Mts Natl Park, Balsam Mt Trail, 83°10'57"W, 35°38'12"N, 20 Oct 2001, 1500 m, hardwood, Berlese, A Tischechkin (2, LSAM); Jackson Co.: Whiteside Mtns nr Highlands, 21 May 1986, 1450–1500 m, A Smetana (4, CNCI); Blue Rgd. Parkway nr Grassy Ridge Mine, 27 May 1986, 1520 m, A Smetana (2, CNCI); Macon Co.: 5 mi NW Highlands near California Gap, 9 Aug 1981, 3000–3500', *Rhododendron* litter with slime- mold fruting bodies, J Pakaluk, Q Wheeler (1, AMNH); Conveta Hydrobio. Sta. Shope Fork, 28 May 1983, 3200', mixed leaf litter, DS Chandler (1, DENH); 1 mi NW Highlands, 16 Aug 1981, hollow stump, Q Wheeler (1, QDWC); Coweeta Hydrobio. Sta. Shope Fork, 30 May 1983, 3200', sweeping, DS Chandler (3, CNCI); Conee Bald, 9 Jun 1981, leaf litter, Q Wheeler (2, QDWC); Highlands, 2 mi NW Nantahala NF, 7 Aug 1981, leaf litter, J Pakaluk, Q Wheeler (2, AMNH); Highlands, 6 Jun 1981, Q Wheeler (1, QDWC); 5 mi NW Highlands near California Gap, 9 Aug 1981, 3000–3500', QD Wheeler (6, QDWC); 2.5 mi NW Highlands, 30 Jun 1983, litter near stream, J Pakaluk (1, AMNH); 3 mi NW Highlands, 29 May 1983, rotten wood, DS Chandler (2, DENH); California Gap, 7 Jun 1984, hardwood litter, QD Wheeler (1, QDWC); 5 mi NW Highlands near California Gap, 3000–3500', *Rhododendron* litter with slime- mold fruting bodies, collected by hand, J Pakaluk, Q Wheeler (1, QDWC); Nantahala Natl Forest, 11 Aug 1981, litter, QD Wheeler (3, QDWC); Highlands, 2 mi W Nantahala NF, 7 Aug 1981, leaf litter, J Pakaluk, Q Wheeler (3, QDWC); Highlands, 12 Aug 1981, 3000', litter, QD Wheeler (8, QDWC); Hwy 64 nr Dry Falls NW Highlands, 16 Jun 1986, 1000 m, A Smetana (1, CNCI); Highlands, 8 Jun 1981, QD Wheeler (4, QDWC); 6 Jun 1981, QD Wheeler (1, QDWC); 1 mi NW Highlands, 1 Aug 1981, 3800', leaf litter, QD Wheeler (1, QDWC); Cowee Bald Mtn, 9 Jun 1981, leaf litter, QD Wheeler (7, QDWC); Highlands, 5 mi NW nr California Gap, 9 Aug 1981, 3000–3500', leaf litter, QD Wheeler (4, QDWC); Highlands, Jun, QD Wheeler (9, QDWC); 1 mi NW Nantahala NF, 7 Jun 1981, axil leaf litter, QD Wheeler (5, QDWC); Highlands Biol. Sta, 10 Jun 1981, leaf litter, QD Wheeler (1, QDWC); 2.5 mi NW Highlands, 30 Jun 1983, 3340', leaf litter, J Pakaluk (1, AMNH); 5 mi NE Highlands, 27 Oct 1969, *Rhododendron* litter, W Shear (2, QDWC); California Gap, 7 Jun 1984, *Rhododendron* and hardwood litter, QD Wheeler (3, QDWC); 5 mi NW Highlands, California Gap, 11 Aug 1981, 3000–3500', *Rhododendron* litter, by hand, QD Wheeler (2, QDWC); Highlands, 5 mi NW nr California Gap, 9 Aug 1981, 3000–3500', leaf litter, QD Wheeler (13, QDWC); 2 mi NW Highlands, 7 Aug 1981, *Rhododendron* litter, J Pakaluk, Q Wheeler (4, QDWC); 4 mi NW Highlands, 6 Jun 1984, QD Wheeler (4, QDWC); Swain Co.: GSMNP, Flat Creek Trail, 83°10'21"W, 35°33'1"N, 31 Jul 2001, 1500 m, Berlese, A Tischechkin (8, LSAM); Transylvania Co.: Blue Ridge Parkway, mi 416, Looking Glass View, 14 Aug 1981, 4500', forest litter, S Peck (12, CNCI); Blue Ridge Parkway mi 416, Looking Glass View, 14 Aug 1981, forest litter, S Peck (2, PECK); nr Looking Glass Rock, 22 Jul 1967, log litter, S Peck, A Fiske (3, PECK); Wilkes Co.: Jeffress Park, Blue Ridge Parkway mi 272, 17 Aug 1981, 3600', log-leaf litter, S Peck (8, PECK); Jeffress Park, Blue Ridge Parkway mi 272, 17 Aug 1981, 3500', leaf litter, S Peck (5, CNCI); Yancy Co.: Mt Mitchell, 31 May 1973, litter under *Rhododendron*, WR Suter (1, FMNH); Black Mts, Blue Ridge Parkway mi 352, 15 Aug 1981, 4900', leaf litter, S Peck (3, CNCI). *Tennessee*: Gatlinburg, 20 Sep 1941, Quirsfeld (1, MCZC); Blount Co.: 5.8 mi E Cling Dome, 1 Jun

1991, CE Carlton (9, LSAM); Cocke Co.: 6 mi SE Cosby, 31 May 1983, forest litter, DS Chandler (1, DENH). *Virginia*: Grayson Co.: Grayson Highlands St Park Picnic Area nr visitors center, 3 Jun 1991, Berlese, CE Carlton (1, LSAM); Washington Co.: E Damascus, 3 Jun 1991, leaf litter, CE Carlton (2, LSAM).

DISCUSSION: This species has been collected primarily from leaf litter (particularly *Rhododendron* litter) and rotting logs. Elevation records are from 2000 to 5300 ft.

Agathidium aztec Subgroup

DISCUSSION: This group is characterized by the shape of the male genitalia. The median lobe of the aedeagus has a moderately to distinctly prominent lateral sulcus near the base of the apical portion (e.g., figs. 184, 186). This sulcus is subtended by prominent, lobelike carinae that extend laterally and dorsally (e.g., figs. 184, 186). This feature is very strongly developed in some taxa but in others is less prominent. The lateral lobes are apically variably sinuate and typically expanded apically and submedially. The lateral lobes fit into the lateral sulcus and between the carinae. Many of these species are dorsally iridescent. There is considerable variation in body size, relative size of the eyes, development of the metasternal carinae, and the male metasternal fovea and metafemur. Two of these species have unusual thornlike structures on the front legs (*A. tribulosum* and *A. tribulograndum*), and one species (*A. multidentatum*) has the apex of the median lobe of the aedeagus asymmetrical. Most of the species are described here as new, and it is a very reasonable assumption that the true diversity of the group in Mexico and Central America is only beginning to be discovered. Most of the species have been collected only by sifting litter and Berlese extractions, suggesting that they are relatively cryptic in habitat.

Agathidium bituberculum Miller and Wheeler, new species Figures 121, 181–183, 359

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEXICO: Chiapas: Cerro Hulteppec ca. 5 km W San Cristobal. R.S.Anderson 92–101 14-IX-1992/wet oak forest litter. Elev. 2700 m./HOLOTYPE *Agathidium bituber-*

culum Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Chiapas, Cerro Hulteppec, ca. 5 km W San Cristobal, 2700 m.

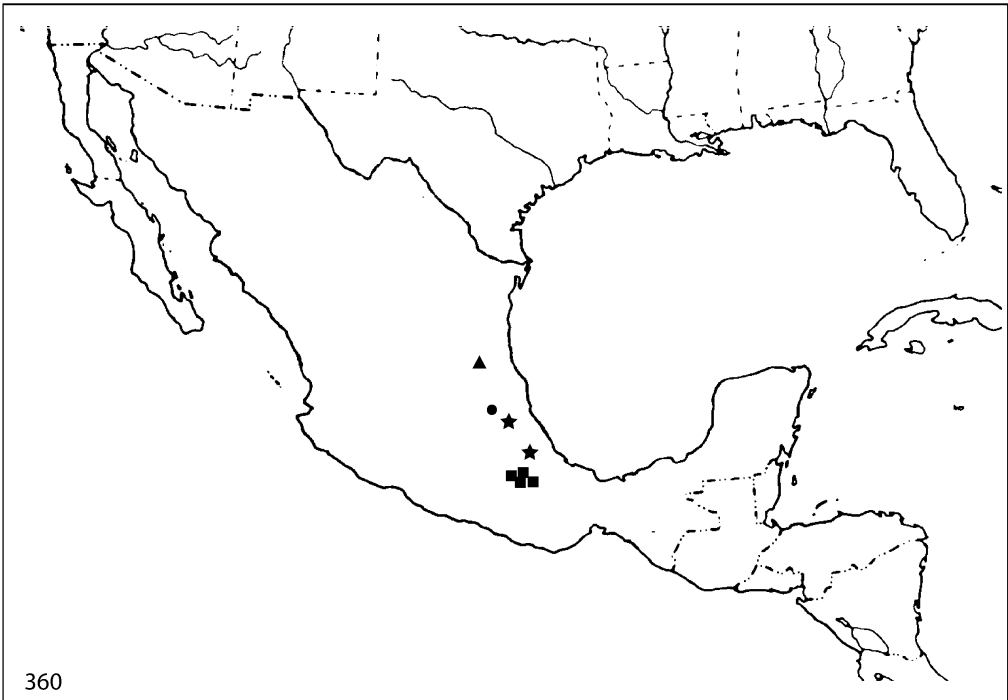
DIAGNOSIS: Males and females of this species are immediately recognizable by the presence of two prominent processes on the gula medially on each side of the midline. The male metafemur has a very large, curved, apical tooth (fig. 121). The male genitalia are also diagnostic (figs. 181–183). The lateral sulcus on the median lobe for reception of the lateral lobe is less well developed than in many other members of the *A. aztec* subgroup (fig. 182).

DESCRIPTION: Body moderate in size (TBL = 2.35–2.94 mm), broad, robust (PNW/TBL = 0.46–0.50), strongly contractile.

Head and pronotum dark red; elytra dark red, iridescent on most specimens; venter yellow-brown to red-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.48–0.55), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes dorsoventrally distinctly compressed; gula with a prominent tubercle or tumidity on each side of midline; antennomere ratios: length I:II:III = 2.1:1.0:1.2, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.76–0.82), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.83–1.01); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, not declivitous; medial carina well developed, not prominent medially. Metasternum moderately narrowed (MTL/MTW = 0.14–0.32), anteriorly sloping dorsad, concave medially; oblique femoral carinae well developed, meeting medially in broad, posterior flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad,



Figs. 359, 360. Geographic distribution of *Agathidium iota*- and *A. oniscoides*-group species: 359, *A. bituberculum* = ▲; *A. iota* = ●. 360, *A. gomezae* = ▲; *A. hidalgoense* = ●; *A. oedema* = ■; *A. skoliosternum* = ★.

with exceptionally large subapical, curved tooth along posterior margin (fig. 121); metasternal fovea, broadly transverse, with dense series of fine setae. Median lobe in lateral aspect elongate, slender, strongly curved basally, expanded medially on dorsal margin by dorsal carina, with shallow lateral sulcus subtending carina for reception of lateral lobe, apical portion curved dorsad, slender, straight, apex pointed and slightly flexed ventrad (fig. 182); in ventral aspect slender, lateral margins subparallel, apical portion evenly narrowed to broadly triangular and acutely pointed apex (fig. 181); operculum broad, apically slightly expanded and broadly rounded (fig. 181); lateral lobes slender throughout length except medially slightly expanded, distinctly bent medially, apex very narrowly rounded with 2 stout setae (fig. 183).

Female 5-4-4.

ETYMOLOGY: This species is named *bituberculum* for the two tubercles present on the gula.

DISTRIBUTION: This species is known only from Chiapas in Mexico (fig. 359).

PARATYPES: MEXICO: *Chiapas*: Yerbabuena Preserve, 2.1 km NW Pueblo Nuevo, Solistahuacan, 21 Sep 1992, cloud forest litter, R Anderson (2, CNCI); 15.1 km NW Bochil., 24 Sep 1992, pine-oak-*Liquidambar* litter, R Anderson (1, CNCI); 10 km W El Bosque, 15 Sep 1992, 1475 m, pine cloud forest litter, R Anderson (14, CNCI); Cerro Hultepec, 5 km W San Cristobal, 14 Sep 1992, 2700 m, wet oak forest litter, R Anderson (17, CNCI); 8.9 km E Rayon, 19 Sep 1991, 1500 m, cloud forest litter, R Anderson (7, CNCI); 8.9 km E Rayon, 19 Sep 1991, 1500 m, cloud forest litter, R Anderson (9, CNCI); 6 km WSW San Cristobal, 24 Sep 1986, 2400 m, litter, pine-oak forest, R Baranowski (7, LUND); Jitotol, 20 Sep 1986, 1500 m, leaf litter under *Salix*(?) shrubs, R Baranowski (6, LUND); 8 km SE San Cristobal, 28 Sep 1986, 2400 m, litter at logs, fungus pine-oak forest, R Baranowski (1, LUND).

DISCUSSION: *Agathidium bituberculum* has been collected only in September. It has been collected from various habitats including oak, pine, *Salix*, and *Liquidambar* forest litter. Elevation records are from 1475 to 2700 m.

Agathidium oedema Miller and Wheeler,
new species

Figures 122, 184–187, 360

TYPE MATERIAL: Holotype, ♂ in CNCI labeled "MEX. Km.10, 10,000' V. Popocate-

petl Mex., V-9-1971 J.M. Campbell/HOLOTYPE *Agathidium oedema* Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: Mexico, State of Mexico, V. Popocatepetl, 10,000'.

DIAGNOSIS: Members of this species have moderately large, finely faceted eyes, a small male metafemoral tooth that is located antepically (fig. 122), and a very distinctive anteromedial prominent line or carina on the metasternum that forms a prominent, posteriorly directed, swollen lobe (as in fig. 113). The species is very similar to *A. gomezae* and *A. hidalgoense* since they possess this unusual modification to the metasternum. *Agathidium gomezae* and *A. hidalgoense* differ from *A. oedema* in the shape of the median lobe. The operculum on the first two species is very long, deeply emarginate, and has each ramus apically prominently expanded ventrad (figs. 188, 192), whereas in *A. oedema* the operculum is only shallowly emarginate apically, not deeply divided (fig. 184). *Agathidium hidalgoense* differs from *A. gomezae* in that the male metafemoral tooth is small but distinct and acute (fig. 124), whereas the tooth in *A. gomezae* is broad and rounded (fig. 123). Also, the apical portion of the median lobe of the aedeagus in *A. hidalgoense* is broader in lateral aspect (fig. 194) and the operculum is not as strongly expanded (fig. 192) compared with *A. gomezae* (figs. 184, 186). Finally, the lobe formed by the sinuate line on the metasternum in *A. gomezae* is swollen, forming a prominent tumidity, whereas in *A. hidalgoense* this lobe is flat and on approximately the same plane as proximate portions of the metasternum.

DESCRIPTION: Body moderately large (TBL = 3.81–3.88 mm), broad, robust (PNW/TBL = 0.46–0.48), strongly contractile.

Head and pronotum red-brown; elytra red-brown, slightly iridescent laterally; venter light red-brown; antennae and palpi red-brown; legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.57–0.71), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed, moderately finely faceted; gula

flat; antennomere ratios: length I:II:III = 1.9:1.0:2.1, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.69–0.77), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.02–1.06); punctation similar to pronotum; sutural stria present in apical one-third. Flight wings well developed. Mesosternum broad, rounded medially; medial carina reduced anteriorly. Metasternum narrow (MTL/MTW = 0.16–0.21), flattened, slightly sloping dorsad anteriorly, with prominent, medial, sinuate line, with lobelike structure medially that may be somewhat swollen (as in fig. 113); oblique femoral carinae present, medially obsolete.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small subapical tooth along posterior margin (fig. 122); metasternal fovea moderately large, transversely linear, with series of fine, dense setae. Median lobe in lateral aspect slender, evenly curved, expanded along dorsal margin submedially with prominent lateral carinae between which is a sulcus that receives the lateral lobe, apical portion slender, somewhat expanded medially, directed dorsally but evenly curved, apex narrowly pointed (fig. 186); in ventral aspect slender, expanded laterally by carinae at base of apical portion, apical portion broad basally, narrowed medially and slender thereafter, apex slightly expanded and rounded (figs. 184, 185); operculum in lateral aspect long, slender, slightly expanded on ventral margin at apex, ending short of apex of median lobe, in ventral aspect long, with lateral margins subparallel or slightly convergent, apex slightly expanded laterally, apicomediaally with short, V-shaped medial emargination (fig. 184); lateral lobes long, slender, apically expanded and strongly sinuate, apices rounded, each with 2 subapical setae (fig. 187).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Greek word *oedema*, meaning “swell-

ing”, for the lobe-shaped metasternal swelling.

DISTRIBUTION: This species is known only from the highlands of central Mexico (fig. 360).

PARATYPES: MEXICO: *Mexico*: Temescaltepec, Real de Arriba, Jul 1934, 6000–7000', HE Hinton, RL Usinger (1, BMNH); Mex/Pueblo border nr Tiamacas, 23 Aug 1987, 11,400', J Doyen (2, EMEC); km 10, V Popocatepetl, 9 May 1971, 10,000', JM Campbell (1, CNCI); 7 air km WSW Juchitepec, 24 Aug 1987, 2750 m, JT Doyen (1, EMEC).

DISCUSSION: This species has been collected from 6000 to 11,400 ft in elevation.

Agathidium gomezae Miller and Wheeler,
new species

Figures 113, 123, 188–191, 360

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEX: Tamps; 1000 m nr Gomez Farias 7.VIII.83, S&J.Peck cloudforest litter/HOLOTYPE *Agathidium gomezae* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Tamaulipas, nr Gomez Farias.

DIAGNOSIS: Members of this species have moderately large, finely faceted eyes, a broad, rounded male metafemoral tooth that is located anteapically (fig. 123), and a very distinctive anteromedial prominent line or carina on the metasternum that forms a prominent, posteriorly directed, swollen lobe (fig. 113). The species is very similar to *A. hidalgoense* and *A. oedema* since they each possess this unusual modification to the metasternum. See the “Diagnosis” under *A. oedema* for characters to separate these species.

DESCRIPTION: Body large (TBL = 3.87–4.15 mm), broad, robust (PNW/TBL = 0.44–0.49), strongly contractile.

Head and pronotum red-brown; elytra red brown, slightly iridescent laterally; venter light red-brown; antennae and palpi red-brown; legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.57–0.66), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not com-

pressed; gula flat; antennae moderately long (ratios: length I:II:III = 2.1:1.0:2.4, width VII:VIII:IX = 1.0:1.0:2.1). Pronotum very large, broad (PNL/PNW = 0.65–0.78), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.06–1.10); punctation similar to pronotum; sutural stria present only at elytral apex. Flight wings well developed. Mesosternum broad, rounded medially; medial carina reduced anteriorly. Metasternum moderately narrow (MTL/MTW = 0.18–0.21), flattened, slightly sloping dorsad anteriorly, with prominent, medial, sinuate line, with lobelike structure medially that may be somewhat swollen (fig. 113); oblique femoral carinae present, medially obsolete.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with broad, rounded subapical tooth along posterior margin (fig. 123); metasternal fovea small, transversely linear, with series of fine, dense setae. Median lobe in lateral aspect slender, evenly curved, expanded along dorsal margin submedially with prominent lateral carinae between which is a sulcus that receives the lateral lobe, apical portion slender, directed dorsally but evenly curved, apex narrowly pointed (fig. 190); in ventral aspect slender, submedially expanded laterally by carinae at base of apical portion, apical portion slender, apex expanded and apically broadly rounded (figs. 188, 189); operculum in lateral aspect long, slender to broadly expanded apex, extending nearly to apex of median lobe, in ventral aspect long, with deep medial emargination, each ramus long, slightly curved, apices expanded and round, slightly divergent (fig. 188); lateral lobes long, slender, somewhat sinuate, submedially expanded and apex expanded with 2 subapical setae (fig. 191).

Female not observed.

ETYMOLOGY: This species is named after the type locality.

DISTRIBUTION: This species is known only from Tamaulipas (fig. 360).

PARATYPES: MEXICO: *Tamaulipas*: Mun.: Gomez Farias, Rancho Cielo, 6 Jul 1986, 1400 m, P Kovarik (2, PECK).

DISCUSSION: This species was collected from "cloud forest litter" and at elevations from 1000 to 1400 m.

Agathidium hidalgoense Miller and Wheeler, new species
Figures 124, 192–195, 360

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX:Hgo; Tlanchinol 43 Km SW Huejutla, 1500 m 14.VI.83, S&J.Peck cloud forest litter/HOLOTYP *Agathidium hidalgoense* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Hidalgo, Tlanchinol, 43 km SW Huejutla, 1500 m.

DIAGNOSIS: Members of this species have moderately large, finely faceted eyes, a small male metafemoral tooth that is located at about two-thirds distant from base of metafemur (fig. 124), and a very distinctive anteromedial prominent line or carina on the metasternum that forms a posteriorly directed lobe (as in fig. 113). The species is very similar to *A. gomezae* and *A. oedema* since they each possess this unusual modification to the metasternum. See the "Diagnosis" under *A. oedema* for characters to separate these species.

DESCRIPTION: Body moderately large (TBL = 3.22–3.64 mm), broad (PNW/TBL = 0.45–0.46), robust, rounded, strongly contractile.

Head and pronotum red-brown; elytra red-brown, iridescent on some specimens; venter yellow-brown to red-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.52–0.68), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula slightly convex medially; antennae moderately long (ratios: length I:II:III = 2.2:1.0:2.2, width VII:VIII:IX = 1.0:1.0:2.2). Pronotum very large, broad (PNL/PNW = 0.73–0.77), strongly convex, anterolateral lobes strongly produced, lateral margin broadly

curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded ($SEL/ELW = 0.95-1.03$); punctation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow ($MTL/MTW = 0.12-0.20$), flat medially, distinctly dorsally sloped anteriorly, with distinct curved line medially on surface; oblique femoral carinae moderately well developed, meeting medially in low carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres more so and with large ventral field of spatulate setae; mandibles not modified; metafemur broad, with small, sharp tooth submedially on posterior margin (fig. 124); metasternal fovea minute, with small pencil of fine setae. Median lobe in lateral aspect long, slender, strongly curved basally, apicomedia with lateral, lobelike carinate expansions between which fit the lateral lobes, apical portion prominent, moderately broad, straight, subapically expanded slightly, apex a sharply curved point (fig. 194); in ventral aspect moderately slender, lateral lobelike carina prominent, apical portion slender medially, apex prominently expanded, apically rounded (figs. 192, 193); operculum in lateral aspect long, slender, prominently expanded and curved at apex, in ventral aspect broad, lateral margins curved, with deep, narrow medial emargination, each ramus somewhat expanded apically and rounded (fig. 192); lateral lobes long, slender basally and curved, medially and apically expanded, sinuate with 2 stout setae (fig. 195).

Female tarsi 5-4-4.

ETYMOLOGY: Named after the type locality of this species.

DISTRIBUTION: This species is known only from the type locality in Hidalgo (fig. 360).

PARATYPES: MEXICO: *Hidalgo*: Tlanchinol, 43 km SW Huejutla, 14 Jun 1983, 1500 m, cloud forest litter, S and J Peck (3, PECK).

DISCUSSION: The type specimens were collected from cloud forest litter at 1500 m.

Agathidium skoliosternum Miller and

Wheeler, new species

Figures 114, 125, 196-198, 360

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX:Ver;7 km E Huatusco 22.VI.83,1040 m Anderson & Peck cloud forest litter/HOLOTYPE *Agathidium skoliosternum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Veracruz, 7 km E Huatusco, 1040 m.

DIAGNOSIS: This species is immediately distinguishable from all *A. oniscoides* group species by the modified anterior margin of the mesosternum which is deeply excavated on each side of the midline, making the anterior margin strongly sinuate (fig. 114). This occurs in both males and females, although in females the excavations are not as deep. In other respects this species strongly resembles *A. aztec*.

DESCRIPTION: Body moderately large (TBL = 2.93-3.22 mm), broad, robust (PNW/TBL = 0.48-0.49), strongly contractile.

Head and pronotum testaceous; elytra testaceous, not iridescent; venter yellow-brown, antennae, palpi, and legs yellow to yellow-brown.

Head broad ($MDL/OHW = 0.59-0.60$), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula slightly concave; antennomere ratios: length I:II:III = 1.6:1.0:1.6, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad (PNL/PNW = 0.73-0.78), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded ($SEL/ELW = 0.87-0.99$); punctation similar to pronotum; sutural stria present only at apex of elytron. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous, anterior margin strongly excavated on each side, medially with anteriorly directed prominence that is apically truncate (fig. 114); with longitudinal carina present

only posteriorly. Metasternum moderately narrow (MTL/MTW = 0.13), flattened, sloping slightly dorsad anteriorly; oblique femoral carinae well developed, meeting medially in low, posteriorly directed lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur relatively narrow, with small subapical tooth along posterior margin, apical margin rounded (fig. 125); metasternal fovea transversely linear, broad, with dense line of fine setae. Median lobe in lateral aspect robust, medially expanded, dorsal margin sinuate, apex slender, slightly curved dorsally, slightly expanded medially along ventral margin, apex slender and pointed (fig. 197); in ventral aspect slender, moderately elongate, medially expanded laterally, apex slender to relatively broadly expanded, arrowhead-shaped apex (fig. 196); operculum long and broad, not extending to apex of median lobe, lateral margins slightly curved, apex bifid, each ramus triangularly pointed, medial emargination narrow (fig. 196); lateral lobe in lateral aspect long, slender, medially slightly expanded and sinuate (fig. 198).

Female tarsi 5-4-4; situation of anterior margin of mesosternum less strongly pronounced than in male.

ETYMOLOGY: This species is named from the Greek words *skolios*, meaning "curved", and *sternum*, meaning "chest", for the strongly excavated and bisinuate anterior margin of the mesosternum in this species.

DISTRIBUTION: This species is known from Puebla and Vera Cruz (fig. 360).

PARATYPES: MEXICO: *Puebla*: 24 km N Xicotepec de Juarez, 17 Jun 1983, oak forest litter, R Anderson (4, PECK); 4.4 mi SW Huachinango, 25 Jul 1969, 1700 m, moist ravine oak forest, malt traps, S and J Peck (1, PECK).

DISCUSSION: This species has been collected from oak forest litter, cloud forest litter, and moist ravine oak forest. Elevation records are from 1040 to 1700 m.

Agathidium erythromelas Miller and Wheeler, new species

Figures 126, 199–202, 361

TYPE MATERIAL: Holotype, ♂ in EMEC labeled "Morelia, 34 mi E., Michoacan,

Mex.VII-2-63/J.Doyen Collector/HOLOTYPE *Agathidium erythromelas* Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: Mexico, Michoacan, 34 mi E Morelia.

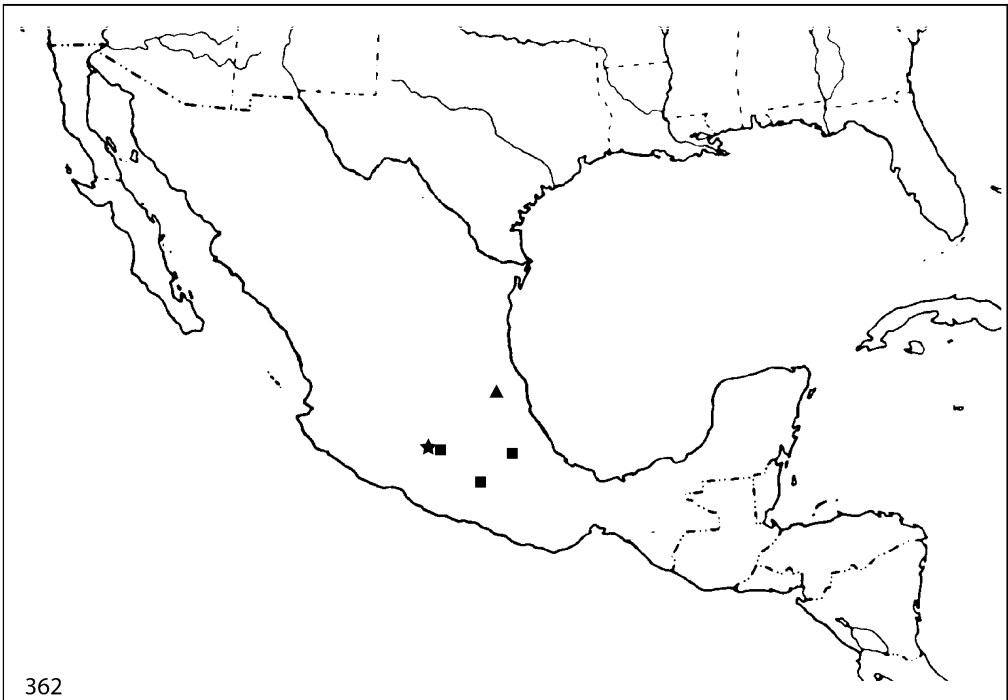
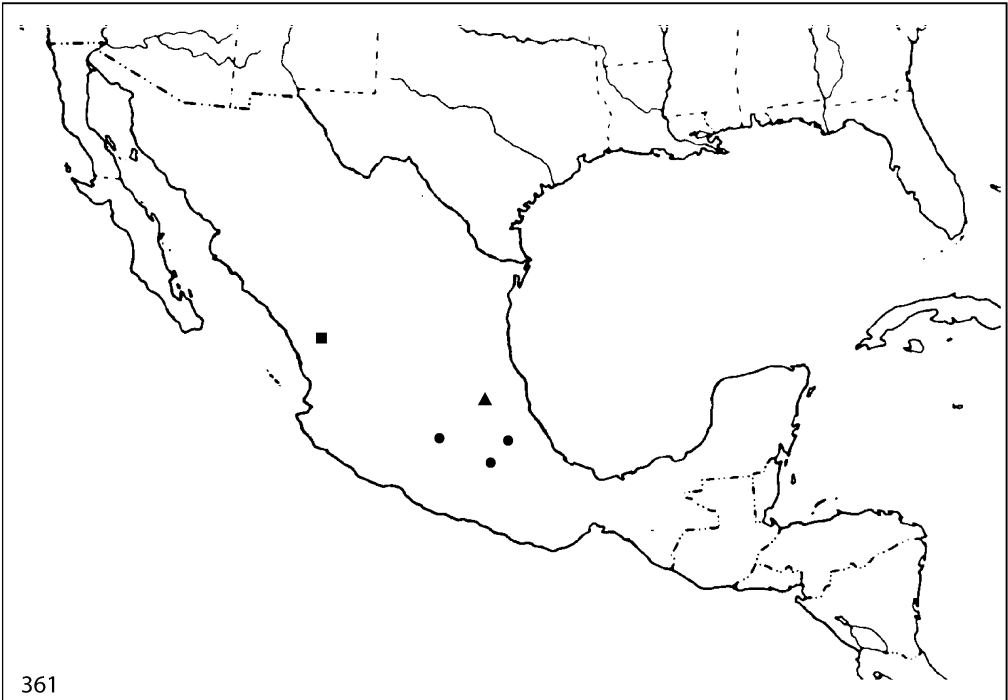
DIAGNOSIS: This species is relatively large and rather conspicuously reddish on the head and pronotum with contrasting black on the elytra. The eyes are relatively large and finely faceted. The metasternum is moderately broad and the oblique metasternal carinae are poorly developed. The male metafemoral tooth is small and anteapical (fig. 126). The male genitalia are distinct with the median lobe slender and strongly curved medially and strongly expanded along dorsal and ventral margins at the base of the apical portion in lateral aspect (fig. 201).

DESCRIPTION: Body large (TBL = 3.47–3.86 mm), broad, robust (PNW/TBL = 0.47–0.48), strongly contractile.

Head and pronotum red; elytra piceous, red apically and along lateral margin, slightly blue-iridescent laterally; venter red, testaceous on metasternum; antennae, palpi, and legs yellow-red.

Head broad (MDL/OHW = 0.58–0.67), dorsal surface flattened, dorsoventrally compressed; impunctate, smooth, shiny; frontoclypeal suture obsolete medially; eyes prominent, not compressed; gula slightly concave; antennomere ratios: length I:II:III = 2.6:1.0:2.3, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.66–0.71), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.05–1.06); punctuation similar to pronotum; sutural stria present in apical one-third. Flight wings fully developed. Mesosternum broad, somewhat convex; medial carina prominent. Metasternum narrow (MTL/MTW = 0.16–0.17), flattened, evenly sloping dorsad anteriorly; oblique femoral carinae not prominent, obsolete medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres more so and with large ventral field



Figs. 361, 362. Geographic distribution of *Agathidium oniscoides*-group species: **361**, *A. erythromelas* = ●; *A. rhamphastes* = ■; *A. triangularum* = ▲. **362**, *A. grumum* = ■; *A. lobosternum* = ▲; *A. megoniscoides* = ★.

of spatulate setae; mandibles not modified; metafemur broad, with small tooth about one-third length from apex (fig. 126); metasternal fovea small, medial, transversely oval, with dense pencil of fine setae. Median lobe in lateral aspect slender in basal half, strongly curved, broadly expanded along dorsal and ventral margins submedially, with prominent lateral sulcus and associated carinae for reception of lateral lobe, apical portion of median lobe slender, evenly curved ventrally, apex pointed (fig. 201); in ventral aspect slender basally, broadly laterally expanded medially, apical portion evenly narrowed basally, then abruptly narrowed, apex a long slender process (figs. 199, 200); operculum in lateral aspect very slender, apically narrowly rounded, in ventral aspect long, slender, lateral margins gently curved, apex narrowly emarginate (fig. 199); lateral lobes very slender, strongly curved, expanded submedially and slightly subapically, broadly sinuate in apical half each with 2 stout subapical setae (fig. 202).

Female not examined.

ETYMOLOGY: This species is named from the Greek words *erythro*, meaning "red", and *melas*, meaning "black", for the red head and pronotum and contrasting black elytron in this species.

DISTRIBUTION: This species is known only from southern Mexico (fig. 361).

PARATYPES: MEXICO: *Mexico*: Temascaltepec, Real de Arriba, Jul 1934, 6000–7000' (2, BMNH); 7 air km WSW Juchitepec, 24 Aug 1987, 2750 m, JT Doyen (3, EMEC). *Michoacan*: 34 mi E Morelia, 2 Jul 1963, J Doyen (2, EMEC); 34 mi E Morelia, 2 Jul 1963, J Doyen (9, EMEC). *Vera Cruz*: 10 mi S Las Vigas, 15 Jul 1971, 10,000', under bark of *Pinus*, A Newton (1, FMNH).

DISCUSSION: *Agathidium erythromelas* has been collected from under pine bark from 6000 to 10,000 ft.

Agathidium rhamphastes Miller and
Wheeler, new species
Figures 127, 203–205, 361

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "14 mi SW El Salto, Dg. MEX. VI.20 '64 E.E.Lindquist, coll./bunch grass & sod below [handwritten]/HOLOTYPE *Agathidium*

rhamphastes Miller and Wheeler, 2003 [red label with black line border]". Only the holotype was examined of this species. The specimen is in several pieces glued to a point.

TYPE LOCALITY: Mexico, Durango, 14 mi SW El Salto.

DIAGNOSIS: This species is somewhat similar to *A. recurvatum* externally but with male pro- and mesobasotarsomeres somewhat more broadly expanded and with a large, flat, triangular process extending anteriorly from the dorsal surface of the labium. The male genitalia (figs. 203–205) are somewhat similar to *A. recurvatum* (figs. 267–269) as well but differ somewhat in the shape of the apical portion of the median lobe and the operculum. In addition, this species bears distinct microreticulation on the dorsal surface of the pronotum and elytron consisting of small, isodiametric cells, a condition unique among Mexican *Agathidium*, but similar to more northern species such as *A. exiguum*.

DESCRIPTION: Body moderate in size (TBL = 3.88 mm), broad, robust (PNW/TBL = 0.46), strongly contractile.

Head and pronotum red; elytra red, not iridescent; venter yellow-red, antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.57), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with indistinct microreticulation consisting of fine, isodiametric cells; frontoclypeal suture obsolete medially; with prominent, anteriorly directed, flat, triangular process extending from (apparently) labium, process upturned apically; eyes moderately large, not dorsoventrally compressed; gula slightly concave; antennomere ratios: length I:II:III = 1.9:1.0:1.7, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.77), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with indistinct microreticulation consisting of fine, isodiametric cells. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.06); punctuation similar to pronotum but with microretic-

ulation much more distinctly evident; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, flattened; medial carina well developed. Metasternum narrow (MTL/MTW = 0.16), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent laterally, medially meeting in moderately prominent, posteriorly directed lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad with broad, moderately large tooth subapically on posterior margin (fig. 127); metasternal fovea moderately large, rounded with moderately large pencil of long, dense, fine setae. Median lobe in lateral aspect slender basally, strongly curved, expanded submedially, with prominent dorsal prominence and lateral carina between which is a sulcus in which fits the lateral lobe, apical portion elongate triangular, slightly sinuate, apex sharply pointed and directed anterad (fig. 204); in ventral aspect slender, long, lateral margins subparallel, apical portion evenly narrowed to slender, sharply pointed apex (fig. 203); operculum moderately long, apex with V-shaped emargination, each ramus triangular in shape, with points directed laterad and ventrad (fig. 203); lateral lobes slender, evenly curved through much of length, apically strongly sinuate and distinctly expanded submedially and apically, apex rounded with 2 stout setae (fig. 205).

Female unknown.

ETYMOLOGY: This species is named from the Greek word *rhamphos*, meaning "curving beak", for the unusual anteriorly produced structure of the labium.

DISTRIBUTION: This species is known only from the type locality in Durango (fig. 361).

DISCUSSION: The type specimen was collected from "bunch grass and sod".

Agathidium megonisoides Miller and
Wheeler, new species
Figures 128, 206–209, 362

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "MEX.:Mor. 7 mi S Tres Cumbres VII-7-1975/QDWheeler colr./HOLOTYPE *Agathidium megonisoides* Miller and

Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Morelos, 7 mi S Tres Cumbres.

DIAGNOSIS: This species is among the largest of Nearctic *Agathidium* and is about the size of many *A. onisoides*. The male metafemoral tooth is subapical and relatively small (fig. 128). The male genitalia are diagnostic with the median lobe long, the apical portion very short and stout, and with weakly developed lateral sulci for reception of the lateral lobes (fig. 208).

DESCRIPTION: Body large (TBL = 4.17–4.69 mm), broad, robust (PNW/TBL = 0.44–0.50), strongly contractile.

Head and pronotum dark red; elytra dark red to testaceous, not iridescent; venter yellow, red-brown on metasternum; antennae, palpi, and legs yellow to yellow-red.

Head broad (MDL/OHW = 0.62–0.70), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes slightly compressed, but protuberant and conspicuous; gula convex; antennomere ratios: length I:II:III = 2.2:1.0:2.3, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.76–0.79), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.81–1.13); punctation similar to pronotum; sutural stria extending from apex to about half elytral length. Flight wings strongly reduced. Mesosternum with surface convex, broad, anterior margin broadly curved; medial carina obscured anteriorly. Metasternum moderately narrow (MTL/MTW = 0.12–0.18), flattened, slightly sloping dorsad anteriorly; oblique femoral carinae low, not strongly developed, especially laterally, medially low and obsolete.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, with large field of ventral spatulate setae; mandibles not modified; metafemur broad, with relatively small curved subapical tooth on posterior margin (fig. 128); metasternal fovea

large, transversely oval, with large, dense brush of fine setae. Median lobe in lateral aspect long, moderately straight throughout length, subapically broad, expanded along dorsal margin, apical portion short, robust, hooked dorsad (fig. 208); in ventral aspect long, straight and parallel-sided, slender, subapically expanded laterally, apical portion short and broadly triangular, apex pointed (figs. 206, 207); operculum in lateral aspect straight, slender, in dorsal aspect very broad, robust, apically truncate with prominent, robust lateral teeth (fig. 207); lateral lobes long, slender, evenly curved through most of length, apex expanded and sinuate, apex pointed, without stout setae (fig. 209).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Greek word *mega*, meaning “large”, and the name *oniscoides*, a common eastern North American species for which this entire species group is named, in reference to the large size of this species and its placement in this group.

DISTRIBUTION: This species is known only from the type series from Morelos, Mexico (fig. 362).

PARATYPES: MEXICO: *Morelos*: 7 mi S Tres Cumbres, 7 Jul 1975, QD Wheeler (4, QDWC).

***Agathidium grumum* Miller and Wheeler,**
new species

Figures 129, 210–212, 362

TYPE MATERIAL: Holotype, ♂ in AMNH labeled “MEXICO: HIDALGO 5 mi NE Acatzingo 27.VI.1975 Q.D.Wheeler [handwritten]/HOLOTYPE *Agathidium grumum* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Hidalgo, 5 mi NE Acatzingo.

DIAGNOSIS: Members of this species can be distinguished from others by the presence of a prominent medial tumidity on the gula, the large, acutely pointed male metafemoral tooth (fig. 129), and the shape of the male genitalia, which are relatively undifferentiated (figs. 210–212). There is a distinct sutural stria on the apical one-third of the elytron. This species is similar to *A. popocatepetlae* (including the shape of the male genitalia), but that species has a smaller male

metafemoral tooth (fig. 133) and lacks the tumidity on the gula.

DESCRIPTION: Body moderately large (TBL = 3.12 mm), broad, robust (PNW/TBL = 0.48), rounded, strongly contractile.

Head and pronotum dark red; elytra dark red-brown, not iridescent; venter yellow; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.59), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes moderately large, only slightly compressed; gula with prominent medial tumidity; antennomere ratios: length I:II:III = 2.4:1.0:1.9, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.71), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.01); punctation and surface similar to pronotum; sutural stria present in apical one-third of elytron. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed, slightly obscured anteriorly. Metasternum narrow (MTL/MTW = 0.14), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, meeting medially in low, but prominent, posteriorly directed carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only somewhat laterally expanded, with moderate ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with very large, flat, triangular tooth subapically on posterior margin (fig. 129); metasternal fovea large, transversely oval with large, dense brush of long fine setae. Median lobe in lateral aspect moderately long, moderately stout, strongly bent basally, apical portion slender, angled dorsad, apically curved ventrad, acutely pointed (fig. 211); in ventral aspect moderately broad, parallel-sided, apically evenly narrowed to narrowly rounded apex (fig. 210); operculum flat, moderately broad, evenly narrowed to rounded apex (fig. 210); lateral lobes long, slender,

slightly expanded and slightly sinuate apically, apices rounded with 2 stout setae (fig. 212).

Female not examined.

ETYMOLOGY: Named from the Latin word *grumus*, meaning "mound", for the prominent medial tumidity on the gula.

DISTRIBUTION: This species is known from southern Mexico (fig. 362).

PARATYPES: MEXICO: *Mexico*: 2 mi NE Tenancingo, 11 Sep 1973, 7100', litter, pine-madros-oak forest, Berlese, A Newton (1, CNCI); Morelia, 7 mi S Tres Cumbres, 7 Jul 1975, QD Wheeler (13, QDWC).

DISCUSSION: Habitat records for this species are from pine-oak forest litter at 7100 ft elevation.

Agathidium triangularum Miller and
Wheeler, new species
Figures 130, 213–215, 361

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX:Hgo;18 KmE Jacala, nr.El Alamo 10.VI.83, 1700 m S&J.Peck, moist oak for.litter/HOLOTYP E *Agathidium triangularum* Miller and Wheeler, 2003 [red label with black line border]". The only specimen examined of this species was the holotype.

TYPE LOCALITY: Mexico, Hidalgo, 18 km E Jacala nr El Alamo.

DIAGNOSIS: Members of this species can be distinguished from other species by the combination of a distinct ventral prominence on the gula which is foveate on the anterior surface, the prominent flat, triangular flange formed where the oblique metasternal carinae meet medially, moderately large and finely faceted eyes, the small male metafemoral tooth (fig. 130), and the male genitalia, which are relatively simple (figs. 213–215). The median lobe is relatively slender and straight and the apical portion is fairly short, apically pointed, and undifferentiated (fig. 213). The operculum is moderately slender and apically slightly expanded and rounded (fig. 213).

DESCRIPTION: Moderately large (TBL = 3.14 mm), body broad, robust, rounded (PNW/TBL = 0.5), strongly contractile.

Head and pronotum dark red-brown; elytra dark red-brown, iridescent laterally; venter

yellow-brown; antennae, palpi, and legs yellow to yellow-red.

Head broad (MDL/OHW = 0.59), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes protruding and prominent but dorsoventrally compressed; gula with prominent anteromedial tumidity which is strongly foveate on anterior surface; antennomere ratios: length I:II:III = 1.9:1.0:2.2, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large, broad (PNL/PNW = 0.73), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.74); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, not declivitous; medial carina well-developed, prominent medially. Metasternum narrowed (MTL/MTW = 0.14), anteriorly sloping dorsad, concave medially; oblique femoral carinae well-developed, meeting medially in strongly-produced, triangular, posterior flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only somewhat laterally expanded, with moderate field of ventral spatulate setae; mandibles not modified; metafemur moderately slender, posteroapical angle produced into small tooth, apical margin sinuate (fig. 130); metasternal fovea prominent, large, transversely oval, with large, dense brush of fine setae. Median lobe in lateral aspect slender, curved basally, apical portion short, broad, directed slightly dorsad, apex slightly sinuate and pointed (fig. 214); in ventral aspect slender, lateral margins parallel, apical portion broad, tapered, apex formed into a narrow process (fig. 213); operculum long, flat, lateral margins convergent apically, apex a parallel-sided, apically rounded process (fig. 213); lateral lobes long, slender, apically expanded, apex pointed with 2 subapical stout setae (fig. 215).

Female not examined.

ETYMOLOGY: Named from the Latin word *triangularus*, meaning "triangle", for the

distinctly triangular shape of the medial metasternal flange.

DISTRIBUTION: This species is known only from the type locality in Hidalgo (fig. 361).

DISCUSSION: The single type specimen was collected from moist oak forest litter at 1700 m elevation.

Agathidium lobosternum Miller and
Wheeler, new species

Figures 131, 216–218, 362

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEX:Hgo; Tlanchinol 43 km SW Huejutla, 1500 m 14.VI.83.S&J.Peck cloud forest litter/HOLOTYPE *Agathidium lobosternum* Miller and Wheeler, 2003 [red label with black line border]”. Unfortunately, the single specimen examined of this species is in several pieces glued to a point.

TYPE LOCALITY: Mexico, Hidalgo, Tlanchinol 43 km SW Huejutla.

DIAGNOSIS: Members of this species have a distinctive tubercle medially near the anterior margin of the gula and a very prominent lobe formed where oblique femoral carinae of the metasternum meet medially. The male genitalia are fairly simple, slender and with the lateral sulcus on the median lobe for reception of the lateral lobe only very weakly developed (fig. 217).

DESCRIPTION: Body moderately large (TBL = 2.85 mm), broad (PNW/TBL = 0.38), robust, rounded, strongly contractile.

Head and pronotum dark red-brown; elytra dark red-brown, not iridescent; venter yellow-brown; antennae, palpi and legs yellow.

Head broad (MDL/OHW = 0.86), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes dorsoventrally distinctly compressed; gula flat, anterior margin with small, prominent tumidity, anterior surface of tumidity with slight fovea; antennomere ratios: length I:II:III = 1.3:1.0:1.3, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.98), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between

punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.02); punctation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed, obscured anteriorly. Metasternum narrow (MTL/MTW = 0.13), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae prominent, well-developed, medially meeting in very prominent, narrowly-rounded, posteriorly-directed lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small tooth subapically along posterior margin (fig. 131); metasternal fovea large, transversely oval with large brush of fine, long setae. Median lobe in lateral aspect slender, curved basally, slightly constricted medially and expanded thereafter, with weak lateral sulcus for reception of lateral lobe, apical portion of median lobe short, sinuate, slender, apex pointed and hooked ventrad (fig. 217); in ventral aspect slender, slightly narrowed medially, apical portion broad, evenly tapered to pointed apex (fig. 216); operculum flat, moderately broad, lateral margins curved to rounded apex (fig. 216); lateral lobes slender, curved medially, apically slightly sinuate, apices narrowly rounded, each with 2 stout setae (fig. 218).

Female not examined.

ETYMOLOGY: Named from the Greek words *lobos*, meaning “lobe”, and *sternum*, meaning “chest”, for the lobe formed where the oblique femoral carinae of the metasternum meet medially.

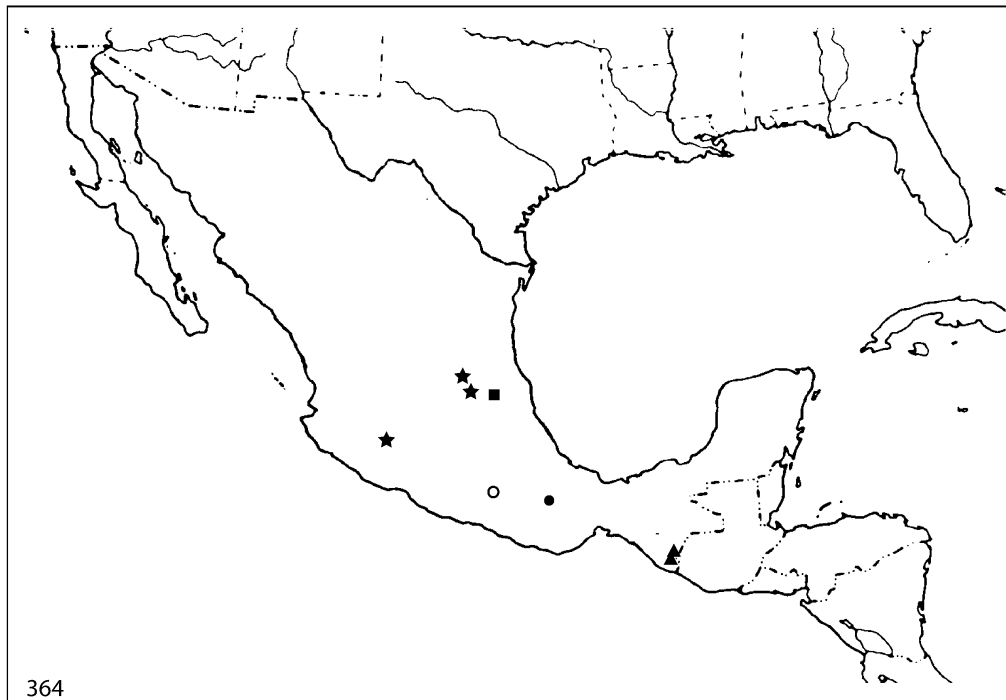
DISTRIBUTION: This species is known only from Hidalgo (fig. 362).

DISCUSSION: The single observed specimen was collected at 1500 m from cloud forest litter.

Agathidium potosii Miller and Wheeler,
new species

Figures 132, 219–221, 363

TYPE MATERIAL: Holotype, ♂ in FMNH labeled “MEX:S.L.P.14 mi.W Xilitla 4800’ VI.29.73 A.Newton/leaf & log litter non-co-



Figs. 363, 364. Geographic distribution of *Agathidium oniscoides*-group species: 363, *A. popocatepetlæ* = ■; *A. potosii* = ●; *A. stenomma* = ★; *A. tribulosum* = ▲. 364, *A. hyle* = ★; *A. grandidentatum* = ○; *A. multidentatum* = ●; *A. sejunctum* = ▲; *A. tribulograndum* = ●.

niferous *Liquidambar* for. /HOLOTYPE *Agathidium potosii* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, San Luis Potosi, 14 mi W Xilitla.

DIAGNOSIS: This species is similar to *A. popocatepetlae*, *A. hyle*, and other relatively undifferentiated Mexican species. The male metafemoral tooth is small (fig. 132), the male metasternal fovea is large and transverse, the metasternum is moderately narrow, and the oblique metasternal lines are not strongly prominent and meet medially in a broad, subtriangular flange. The male aedeagus is not strongly modified (figs. 219–221). The apex of the median lobe is short, subtriangular, sharply pointed and, in lateral aspect, strongly curved apically (fig. 220). The operculum is moderately long, broad, flattened, and has the apex distinctly expanded laterally with lateral teeth (fig. 219).

DESCRIPTION: Body small (TBL = 2.22 mm), broad, robust (PNW/TBL = 0.48), strongly contractile.

Head and pronotum red; elytra red, not iridescent; venter yellow-brown; antennae and palpi yellow to yellow-brown.

Head broad (MDL/OHW = 0.61), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes relatively prominent and coarsely faceted, somewhat dorsoventrally compressed; gula strongly concave in anterior half; antennomere ratios: length I:II:III = 2.1:1.0:1.5, width VII:VIII:IX = 1.0:1.0:2.3. Pronotum very large, broad (PNL/PNW = 0.68), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.93); punctuation similar to pronotum; a faint sutural stria extending from apex for about one-fifth of elytral length. Flight wings strongly reduced. Mesosternum broad, convex; medial carina prominent. Metasternum moderately broad (MTL/MTW = 0.20), medial surface slightly concave, distinctly sloping dorsad anteriorly; oblique femoral carinae moderately well de-

veloped, meeting medially in broadly triangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with moderately large ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with prominent, small tooth subapically on posterior margin (fig. 132); metasternal fovea large, transverse, with large, prominent, dense brush of long fine setae. Median lobe in lateral aspect slender, strongly curved basally, relatively straight thereafter, apical portion short, slender, directed at angle dorsad, apically curved back ventrad, apex sharply pointed (fig. 220); in ventral aspect slender, slightly expanded at base of apical portion, which has the lateral margins slightly curved to broadly pointed apex (fig. 219); operculum flat, broad, moderately long, apex slightly expanded with lateral teeth (fig. 219); lateral lobes very slender, evenly curved basally, straight distally, apically slightly expanded and slightly sinuate, apices rounded with 2 stout setae (fig. 221).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for the type locality.

DISTRIBUTION: This species is known only from San Luis Potosi and Michoacan (fig. 363).

PARATYPES: MEXICO: *Michoacan*: Cerro de Garnica, Puerto Garnica, 18 Sep 1973, 9400', oak-pine, Berlese, A Newton (3, CNCI).

DISCUSSION: This species has been collected from pine and *Liquidambar* forest from 4800 to 9400 ft elevation.

Agathidium popocatepetlae Miller and Wheeler, new species
Figures 133, 222–224, 363

TYPE MATERIAL: Holotype, ♂ in CNCI labeled “MEX. Km. 10,000' V. Popocatepetl Mex., V-9-1971 J.M. Campbell /HOLOTYPE *Agathidium popocatepetlae* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, State of Mexico, Popocatepetl, 10,000'.

DIAGNOSIS: Members of this species can be distinguished from others by the combination of a small male metafemoral tooth that is lo-

cated about two-thirds to three-fourths distant from the base of the metafemur (fig. 133), the moderately large eyes, and the unmodified gula and the male genitalia, which are relatively simple and undifferentiated (figs. 222–224). The species is somewhat similar to *A. grumum* but lacks the distinct tumidity on the gula and has a smaller and more proximally located male metafemoral tooth.

DESCRIPTION: Body moderately small (TBL = 2.47–2.55 mm), broad (PNW/TBL = 0.44–0.48), robust, strongly contractile.

Head, pronotum, and elytra yellow to yellow-red; venter, antennae, and palpi yellow.

Head broad (MDL/OHW = 0.54–0.69), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent with large facets, not reduced; gula concave; antennomere ratios: length I:II:III = 2.4:1.0:1.8, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.73), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.06–1.13); punctuation similar to pronotum; sutural stria extending from apex for about two-thirds of elytral length. Flight wings strongly reduced. Mesosternum broad, convex; medial carina prominent. Metasternum moderately broad (MTL/MTW = 0.15), medial surface flattened, gently sloping dorsad anteriorly; oblique femoral carinae moderately developed, meeting medially in low, broad flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with moderately large ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with prominent, acute tooth submedially on posterior margin (fig. 133); metasternal fovea small, slightly transversely oval, with small, dense brush of fine setae. Median lobe in lateral aspect stout, robust, evenly curved, apical portion short, broadly triangular, apically narrowed and abruptly curved ventrad, apex sharply point-

ed (fig. 223); in ventral aspect broad, apically narrowed, apex abruptly narrowed and with medial, rounded prominence (fig. 222); operculum flat, broad, apex rounded with medial prominence (fig. 222); lateral lobes moderately broad, evenly curved basally, straight distally, apices rounded with 2 stout setae (fig. 224).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for the mountain where the type series was collected.

DISTRIBUTION: This species is known only from the type locality high on Popocatepetl, Mexico (fig. 363).

PARATYPES: MEXICO: *Mexico*: km 10, V. Popocatepetl, 9 May 1971, 10,000', JM Campbell (3, QDWC).

DISCUSSION: The type series was collected at 10,000 ft.

Agathidium hyle Miller and Wheeler,
new species

Figures 134, 225–227, 364

TYPE MATERIAL: Holotype, ♂ in FMNH labeled "MEXICO: Jalisco E slope Nevado de Colima 5600 Ft ix.22.1973/A. Newton collector/leaf litter mixed hardwood-conifer forest/HOLOTYPE *Agathidium hyle* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Jalisco, east slope of Nevado de Colima, 5600'.

DIAGNOSIS: This species is similar to *A. popocatepetlae* and other relatively undifferentiated Mexican species. The male metafemoral tooth is small (fig. 134), the male metasternal fovea is large and transverse, the metasternum is moderately narrow, and the oblique metasternal lines are not strongly prominent and meet medially in a broad, subtriangular flange. The aedeagus is not strongly modified. The apex of the median lobe is short, subtriangular, sharply pointed, and, in lateral aspect, strongly curved apically (fig. 225). The operculum is moderately long, broad, flattened, has the lateral margins broadly rounded, and the apex is distinctly emarginate (fig. 225).

DESCRIPTION: Body small (TBL = 2.36 mm), broad, robust (PNW/TBL = 0.49), strongly contractile.

Head and pronotum red to piceous, lighter around margins; elytra red to piceous, lighter red around margins, not iridescent; venter yellow-brown; antennae and palpi yellow to yellow-brown.

Head broad (MDL/OHW = 0.68), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes relatively prominent and finely faceted, somewhat dorsoventrally compressed; gula concave; antennomere ratios: length I:II:III = 2.1:1.0:1.7, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.72), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.88); punctation similar to pronotum; sutural stria extending from apex for about one-third of elytral length. Flight wings strongly reduced. Mesosternum broad, convex; medial carina prominent. Metasternum moderately broad (MTL/MTW = 0.15), medial surface flattened, gently sloping dorsad anteriorly; oblique femoral carinae moderately well developed, meeting medially in broadly triangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with moderately large ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with prominent, small, acute tooth subapically on posterior margin (fig. 134); metasternal fovea large, transverse, with large, prominent, dense brush of long fine setae. Median lobe in lateral aspect slender, strongly curved basally, relatively straight thereafter, apical portion short, slender, directed at angle dorsad, apically curved back ventrad, apex sharply pointed (fig. 226); in ventral aspect slender, slightly expanded at base of apical portion which is subtriangular and more strongly tapered in apical one-fourth to pointed apex (fig. 225); operculum flat, broad, moderately long, apex rounded with distinct medial emargination (fig. 225); lateral lobes very slender, evenly curved basally, straight distally, apically

slightly expanded and slightly sinuate, apices rounded with 2 stout setae (fig. 227).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Greek word *hyle*, meaning "material" or "stuff", because the type specimens were collected from forest leaf litter.

DISTRIBUTION: This species is known from southern Mexico (fig. 364).

PARATYPES: MEXICO: *Hidalgo*: 7 mi NE Jacala, 23 Jun 1975, QD Wheeler (17, QDWC). *San Luis Potosi*: 40 km W Xilitla, 6 Aug 1983, 1700 m, pine-oak forest litter, S and J Peck (1, PECK).

DISCUSSION: This species has been collected from pine-oak forest and mixed hardwood litter. Altitude records are from 5600 ft.

Agathidium stenomma Miller and Wheeler,
new species

Figures 109, 135, 228–231, 363

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEXICO: Oaxaca: 55.5 km SW Valle Nacional, KM 108.5. R.S. Anderson 92-037 28-VII-1992/wet oak-pine forest, leaf litter Berlese. Elev. 2800 m./HOLOTYPE *Agathidium stenomma* Miller and Wheeler, 2003 [red label with black line border]". The holotype is the only specimen examined of this species.

TYPE LOCALITY: Mexico, Oaxaca, 55.5 km SW Valle Nacional, km 108.5.

DIAGNOSIS: This species is extremely similar to *A. recurvatum*, including the shape of male genitalia (see the "Diagnosis" under that species), but differs in having the eyes strongly dorsoventrally compressed to a long, narrow structure (fig. 109).

DESCRIPTION: Body moderate in size (TBL = 2.92 mm), broad, robust (PNW/TBL = 0.48), rounded, strongly contractile.

Head and pronotum dark red; elytra dark red, lighter along margins, not iridescent; venter, antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.57), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes strongly compressed dorsoventrally to slender, elongate hourglass shape (fig. 109); gula flat; antennomere ratios: length I:II:III = 2.1:1.0:

1.7, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.71), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.99); punctuation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed, interrupted medially. Metasternum narrow (MTL/MTW = 0.13), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, meeting medially in low, but prominent carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur broad, with very large, broad, apically rounded tooth subapically on posterior margin (fig. 135); metasternal fovea moderately large, transverse with large, dense brush of long fine setae. Median lobe in lateral aspect slender basally, strongly curved, expanded submedially, with prominent dorsal prominence, apical portion elongate triangular, apex abruptly recurved and sharply pointed (fig. 230); in ventral aspect slender, long, lateral margins broadly sinuate, apical portion evenly narrowed to slender, sharply pointed apex (figs. 228, 229); operculum flat, broad, apex slightly emarginate (fig. 228); lateral lobes slender, evenly curved through much of length, apically slightly sinuate, apex rounded with 2 stout setae (fig. 231).

Female not examined.

ETYMOLOGY: Named from the Greek words *stenos*, meaning "narrow", and *omma*, meaning "eye", for the greatly compressed eyes of members of this species.

DISTRIBUTION: This species is known only from the type locality in Oaxaca (fig. 363).

DISCUSSION: The single specimen examined was extracted using a Berlese device from "wet oak-pine forest litter" collected at 2800 m elevation.

Agathidium tribulosum Miller and Wheeler, new species
Figures 115, 136, 232–235, 363

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "GUAT.: QUETZAL-TENANAGO: 12 km SE Zunil, NW face Cerro Zunil. hardwd. for litter. 2700–2760 m. R. Anderson 91-30, 28-V-1991/HOLOTYPE *Agathidium tribulosum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Guatemala, Quetzal-Tenango, 12 km SE Zunil, NW face Cerro Zunil, 2700 m.

DIAGNOSIS: Males of this species are immediately recognizable based on the presence of a long, flat, thornlike spine on the protrochanter (fig. 115) and the metatrochanter which is concave with the apex produced ventrally in a short, but prominent, tubercle. The metasternum is relatively broad medially, flat, and nearly glabrous. The metasternal fovea is minute and located posteriorly. The median lobe is very distinctive with the apex long, sharply pointed, and sharply recurved in lateral aspect (figs. 232, 233). The apex is also slightly bent and twisted (fig. 233), making it uniquely asymmetrical. Both sexes have relatively prominent dorsal punctuation consisting of clusters of 2–3 minute punctules.

DESCRIPTION: Body moderately small to moderately large (TBL = 2.93–4.40 mm), broad, robust (PNW/TBL = 0.40–0.53), strongly contractile.

Head and pronotum testaceous to piceous; elytra testaceous to piceous, lighter apically and along lateral margins; venter red-brown; antennae and palpi yellow.

Head broad (MDL/OHW = 0.57–0.60), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes dorsoventrally compressed, but still conspicuous; gula slightly concave; antennomere ratios: length I:II:III = 2.6:1.0:1.9, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.72–0.91), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; surface covered with fine, minute punctures in clusters of 2–3, clusters conspicuous and moderately

dense, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.82–1.16); punctation similar to pronotum; sutural stria present only at elytral apex. Flight wings strongly reduced. Mesosternum broad, rounded medially; medial carina obsolete anteriorly. Metasternum narrow (MTL/MTW = 0.11–0.20), flattened, strongly sloping dorsad anteriorly; oblique femoral carinae present, but not high, medially not prominent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres more so with large ventral field of spatulate setae; mandibles not modified; pro-trochanter with ventral, sharp, thornlike spine (fig. 115); apex of metatrochanter produced into deflexed tooth; metafemur moderately broad, with prominent, rounded subapical tooth along posterior margin, posterior margin distinctly serrate (fig. 136); metasternal fovea posterior, small, ovoid, with small pencil of fine setae. Median lobe in lateral aspect elongate, slender, strongly curved basally, relatively straight thereafter, expanded along dorsal and ventral margins submedially, apical portion long, slender, straight basally, apex strongly sinuate, slightly expanded, and hooked ventrally (fig. 234); in ventral aspect slender, narrowed medially, expanded slightly submedially by lateral extension of carina which, together with dorsal carina form a sulcus in which can be placed the lateral lobe, apical portion slender, distinctly asymmetrical, apex twisted and bent to right (figs. 232, 233); operculum in lateral aspect long, straight, and slender, in ventral aspect with margins evenly convergent, apex distinctly, but not deeply, emarginate (fig. 232); lateral lobes long, slender, strongly curved basally, moderately expanded medially, apically broadly sinuate, apex slightly expanded and broadly rounded with 2 stout setae (fig. 235).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named *tribulosum*, Latin for “thorny”, after the thornlike tooth on the male pro-trochanter.

DISTRIBUTION: This species is known from southern Mexico and Guatemala (fig. 363).

PARATYPES: GUATEMALA: *Quetzaltenango*: 12 km SE Zunil, NW face Cerro Zunil., 28 May 1991, 2700–2760 m, hardwood forest litter, RS Anderson (38, CNCI).

MEXICO: *Chiapas*: 7 km SSW Motozintla de Mendoza, 19 Sep 1992, 2000 m, cloud forest litter, RS Anderson (2, CNCI); Volcan Tacana, lower slopes, ca. 4 km N Union Juarez, 19 Sep 1992, 1950 m, cloud forest litter, RS Anderson (47, CNCI).

DISCUSSION: The species has been collected from cloud forest litter and hardwood forest litter. Elevation records are from 1950 to 2760 m.

Agathidium tribulograndum Miller and Wheeler, new species

Figures 116, 137, 236–239, 364

TYPE MATERIAL: Holotype, ♂ in FMNH labeled “MEXICO: Hidalgo 2.5–3.5 mi N Tlan-chinol, 50–5200 ft. vii.6–11.1973/fungusy wood chips A. Newton/HOLOTYPE *Agathidium tribulograndum* Miller and Wheeler, 2003 [red label with black line border]”. Only a single specimen is known of this species.

TYPE LOCALITY: Mexico, Hidalgo, 2.5 mi N Tlanchinol.

DIAGNOSIS: Males of this species are immediately recognizable by the combination of the very large, flattened tooth extending from the ventral surface of the procoxa (fig. 116), the characteristic metafemur with two prominent teeth and a relatively strongly concave surface between them (fig. 137), and the relatively broad metasternum with the fovea located anterad of the middle. The male genitalia, while unique in shape (figs. 236–239), are also similar to many of the other members of the *A. aztec* subgroup.

DESCRIPTION: Body moderate in size (TBL = 3.44 mm), broad, robust (PNW/TBL = 0.48), strongly contractile.

Head and pronotum red; elytra red, with blue iridescence laterally; venter yellow, dark brown on metasternum; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.54), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula flat; antennomere ratios: length I:II:III = 1.6:1.0:1.6, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad

(PNL/PNW = 0.76), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.00); punctuation similar to pronotum; sutural stria present in apical one-half. Flight wings fully developed. Mesosternum broadly convex; medial carina prominent. Metasternum narrow medially (MTL/MTW = 0.18), slightly sloping dorsad anteriorly, flattened, smooth; oblique femoral carinae low, not strongly developed, especially laterally, medially low and obsolete.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres more so and with large field of spatulate setae ventrally; mandibles not modified; metafemur moderately broad, prominent, with distinct tooth about one-third distance from apex, smaller tooth about one-third distance from base, with concave area between, apical margin rounded (fig. 137); metasternal fovea large, anteromedial, transversely oval, with dense brush of long, fine setae; procoxa with large ventral, broad flattened tooth (fig. 116). Median lobe in lateral aspect long, slender, evenly curved, expanded subapically along dorsal margin, apical portion directed dorsad at angle, slender, straight, apically slightly expanded and curved ventrad, apex narrowly rounded (fig. 238); in ventral aspect slender, evenly constricted medially, expanded basal to apical portion with a distinct carina which forms, together with dorsal carina, a sulcus in which fits the lateral lobe, apical portion narrowed to elongate, slender apex (figs. 236, 237); operculum elongate, parallel-sided, slightly expanded apically, apex rounded with small medial emargination (fig. 236); lateral lobes long, slender, subapically expanded, apex evenly expanded, rounded, sinuate apically, apex abruptly narrowed, with a single stout subapical seta (fig. 239).

Female not examined.

ETYMOLOGY: This species is named from the Latin words *tribulus*, meaning "thorn", and *grandis*, meaning "large", for the large, thornlike process on the male procoxa.

DISTRIBUTION: This species is known only from the type locality in Hidalgo (fig. 364).

DISCUSSION: The holotype was collected from "fungusy wood chips" at "5000-5200 ft".

Agathidium invisitatum Miller and
Wheeler, new species
Figures 138, 240-243, 365

TYPE MATERIAL: Holotype, ♂ in FMNH labeled "MEXICO: Mexico W slope Nevado de Toluca, 11,000 ft ix.16.1973/under pine bark A. Newton/HOLOTYPE *Agathidium invisitatum* Miller and Wheeler, 2003 [red label with black line border]".

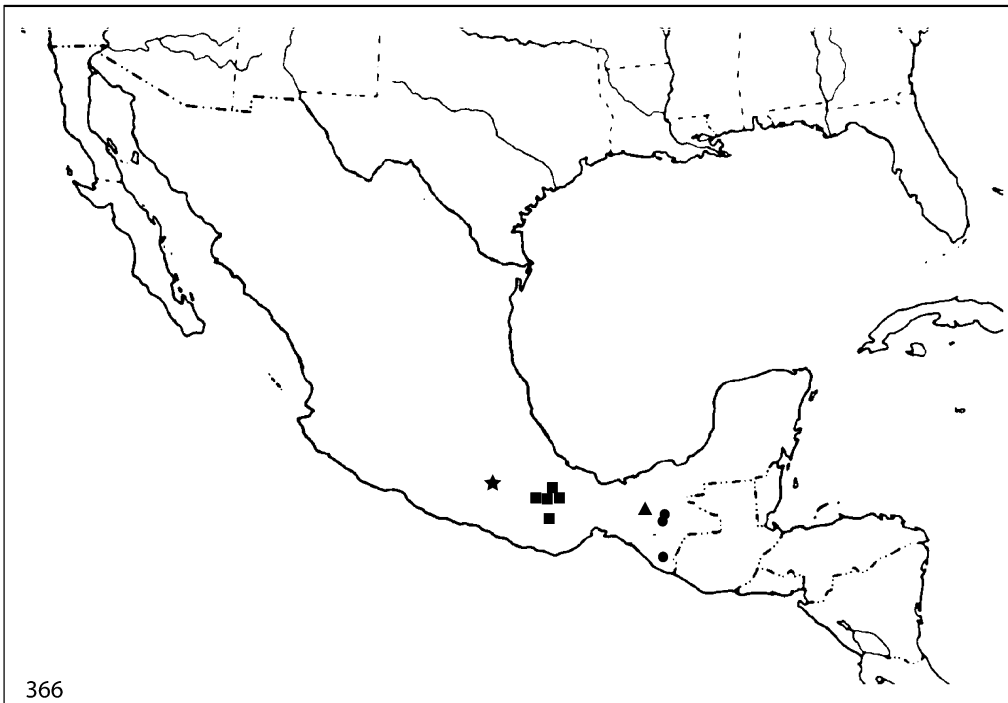
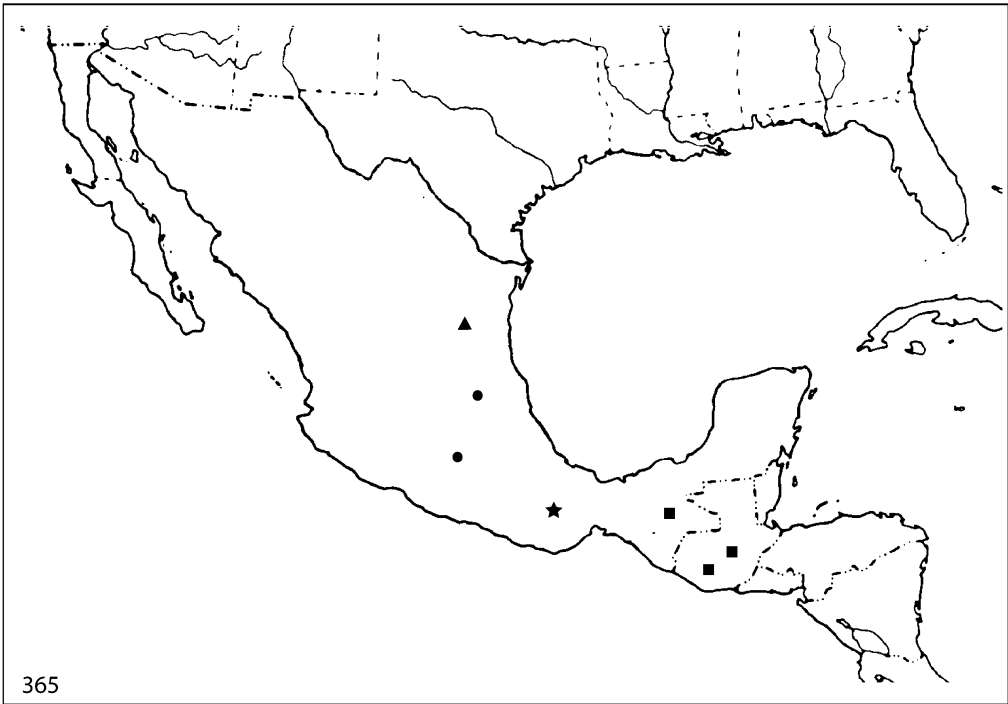
TYPE LOCALITY: Mexico, State of Mexico, west slope of Nevado de Toluca, 11,000'.

DIAGNOSIS: This species is identifiable by the presence of a prominent series of four denticles on the male metafemur with the largest at about two-thirds the distance from the base of the metafemur (fig. 138). The metasternum is moderately broad medially and the eyes are moderately large and finely faceted. The male genitalia are distinctive with a long and broad operculum that is apically distinctly emarginate (fig. 240). The rami of the operculum are apically expanded ventrad (fig. 242).

DESCRIPTION: Body moderately large (TBL = 3.28-3.82 mm), broad (PNW/TBL = 0.44-0.52), robust, rounded, strongly contractile.

Head and pronotum dark yellow-red; elytra dark yellow-red, distinctly iridescent; venter yellow-red; antennae and palpi yellow-red; legs yellow.

Head broad (MDL/OHW = 0.53-0.63), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula flat; antennae moderately long (ratios: length I:II:III = 1.9:1.0:2.0, width VII:VIII:IX = 1.1:1.0:2.0). Pronotum very large, broad (PNL/PNW = 0.72-0.78), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny,



Figs. 365, 366. Geographic distribution of *Agathidium oniscoides*-group species: **365**, *A. andersoni* = ■; *A. disgregum* = ▲; *A. invisitatum* = ●; *A. oaxacaense* = ★. **366**, *A. impensum* = ★; *A. oculum* = ●; *A. recurvatum* = ■; *A. cheneyi* = ▲.

smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.93–1.07); punctation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina low but distinctly developed. Metasternum narrow (MTL/MTW = 0.13–0.17), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, forming a low carina medially.

Male tarsi 5-5-4; pro- and mesobasotarso-meres somewhat laterally expanded, protarsomeres more so and with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with several prominent, small teeth medially along posterior margin (fig. 138); metasternal fovea small with small pencil of fine setae. Median lobe in lateral aspect slender basally, more robust submedially, with small, but prominent, lobelike lateral carinae between which fit the lateral lobes, apical portion relatively short, curved ventrad, apex pointed (fig. 242); in ventral aspect moderately slender, apical portion narrowed, slender to expanded, rounded apex (figs. 240, 241); operculum in lateral aspect slender, apically expanded and slightly curved ventrad (fig. 242), in ventral aspect broad, short, apically narrowly emarginate, each ramus with small lateral tooth (fig. 240); lateral lobes slender, curved basally, apical one-third broader and sinuate, apices rounded, each with 2 stout setae (fig. 243).

Female not examined.

ETYMOLOGY: Named for the Latin word *in-visitatus*, meaning “strange”, for the unusual teeth on the male metafemur.

DISTRIBUTION: This species has been collected from central Mexico (fig. 365).

PARATYPE: MEXICO: *San Luis Potosi*: 14 mi W Xilitla, 29 Jun 1973, 4800', under bark, *Liquidambar* forest, A Newton (1, FMNH).

DISCUSSION: The species is known from under bark at 4800 to 11,000 ft elevation.

Agathidium multidentatum Miller and Wheeler, new species
Figures 139, 244–247, 364

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEX.:OAX.; 3.5 mi S Suchixtepec, 8000' 3.vi.1971 S. Peck Ber208, leafitter/

HOLOTYPE *Agathidium multidentatum* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Oaxaca, 3.5 mi S Suchixtepec.

DIAGNOSIS: Males of this species are recognizable by the multidentate metafemur (fig. 139) and the very unique median lobe with the operculum long and slender and apically with lateral hooks (fig. 244). The metasternum is moderately narrow and the metasternal fovea is transverse and moderately large.

DESCRIPTION: Body relatively large (TBL = 3.52–3.74 mm), broad, robust (PNW/TBL = 0.46), strongly contractile.

Head and pronotum testaceous; elytra testaceous, not iridescent; venter dark brown; antennae and palpi yellow-brown; legs dark brown to red brown.

Head broad (MDL/OHW = 0.51–0.53), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eye slightly compressed, but not strongly reduced; gula convex anteriorly; antennomere ratios: length I:II:III = 1.7:1.0:1.4, width VII:VIII:IX = 0.9:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.80–0.82), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.07–1.08); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina present, but not strongly developed. Metasternum moderately narrow (MTL/MTW = 0.12–0.13), flattened, sloping dorsad anteriorly; oblique femoral carinae well developed, meeting medially in very low carina.

Male tarsi 5-5-4; pro- and mesobasotarso-meres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, posteroapical margin with conspicuous, curved tooth and series of smaller teeth, apical margin irregularly excavated (fig.

139); metasternal fovea linear, transverse with line of dense, fine setae. Median lobe in lateral aspect long, slender, moderately curved, dorsal margin bisinuate, apex long, slender, straight with apical reflexed hook (fig. 246); in ventral aspect slender, with medial abrupt expansion consisting of laterally directed carina which together with the dorsal carinae form a sulcus in which fits the lateral lobe, apex slender, slightly expanded medially tapering to narrowly rounded apex (figs. 244, 245); operculum long, apex laterally produced into conspicuous laterally and dorsally directed hooks, apex distinctly emarginate (fig. 244); lateral lobes very long, slender, medially expanded and sinuate, apex slender to very narrowly rounded, with 2 long apical setae (fig. 247).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Latin words *multus*, meaning “much”, and *dentatus*, meaning “tooth”, for the multiple teeth present along the posterior margin of the male metafemur in this species.

DISTRIBUTION: This species is known only from Oaxaca (fig. 364).

PARATYPES: MEXICO: *Oaxaca*: 5.1 km S Suchixtepec, 25 Jul 1992, 2150 m, oak-alder-pine leaf litter, Berlese, RS Anderson (1, CNCI); 4.6 km S Suchixtepec, 23 Jul 1992, wet riparian alder forest, leaf litter, RS Anderson (1, CNCI); 3.5 mi S Suchixtepec, 3 Jun 1971, 8000', leaf litter, S Peck (9, PECK).

DISCUSSION: The species has been collected from oak, alder, pine, and “wet riparian” forest litter. Elevation records are from about 2400 m.

Agathidium sejunctum Miller and Wheeler,
new species

Figures 140, 248–250, 364

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEXICO: Chiapas: Volcan Tacana, lower slopes, ca. 4 km N Union Juarez. 18-IX-1992 R.S.Anderson 92-109/cloud forest litter Elev. 1950 m./HOLOTYPE *Agathidium sejunctum* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Chiapas, lower slopes of Volcan Tacana, ca. 4 km N Union Juarez, 1950 m.

DIAGNOSIS: This species can be distin-

guished from most species in this subgroup by the very large, acutely pointed male metafemoral tooth (fig. 140). The gula is unmodified. The male genitalia are relatively simple (figs. 248–250). This species is extremely similar to *A. grandidentatum* but specimens are larger, are generally iridescent dorsally, have the mesosternal carina medially usually with a low spot dividing the carina into anterior and posterior portions, and exhibit some differences in shape of the male genitalia. In *A. sejunctum* there is a prominent dorsal lobelike carinae alongside which is a large fovea in which fits the lateral lobes (fig. 249). This is much less distinct in *A. grandidentatum* (fig. 252).

DESCRIPTION: Body moderately large (TBL = 2.69–3.16 mm), broad, robust, rounded (PNW/TBL = 0.44–0.48), strongly contractile.

Head and pronotum red-brown to piceous; elytra red-brown to piceous, iridescent; venter yellow to red-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.58–0.66), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes compressed dorsoventrally; gula slightly concave; antennomere ratios: length I:II:III = 2.0:1.0:1.4, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large (PNL/PNW = 0.77–0.82), broad, strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.80–1.03); punctuation and surface similar to pronotum; sutural stria present in apical one-fourth of elytron. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed, on most specimens clearly interrupted medially. Metasternum narrow (MTL/MTW = 0.13–0.15), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, meeting medially in low, but prominent carina.

Male tarsi 5-5-4; pro- and mesobasotar-

someres moderately laterally expanded, more so with protarsomeres, with moderate ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with very large, flat, acutely pointed tooth subapically on posterior margin (fig. 140); metasternal fovea moderately large, transverse with large, dense brush of long fine setae. Median lobe in lateral aspect slender, moderately long, strongly curved basally, with distinct dorsal expansion at base of apical portion along side of which is a triangular fovea for reception of lateral lobe, apical portion of median lobe slender, distinctly flexed dorsad, apex abruptly curved ventrad, sharply pointed (fig. 249); in ventral aspect moderately broad, slightly expanded medially, apical portion evenly narrowed to pointed apex (fig. 248); operculum flat, short, slender, apex rounded, not emarginate (fig. 248); lateral lobes moderately broad, long, curved basally, slightly expanded and slightly sinuate apically, apices rounded with 2 stout setae (fig. 250).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for the Latin word *sejunctum*, meaning "separated", for the medially interrupted mesosternal carina in most members of this species.

DISTRIBUTION: This species is known only from Chiapas (fig. 364).

PARATYPES: MEXICO: *Chiapas*: 7.4 km SSW Motozintla de Mendoza, 17 Sep 1992, cloud forest litter, R Anderson (12, CNCI); Volcan Tacana, lower slopes, 4 km N Union Juarez, 19 Sep 1992, 2000 m, cloud forest litter, R Anderson (43, CNCI).

DISCUSSION: The species has been collected from cloud forest litter at 2000 m.

Agathidium grandidentatum Miller and Wheeler, new species
Figures 141, 252, 253, 364

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEXICO: Guerrero: 5.6 km SW Filo de Caballo R.S. Anderson 92-013 17-VII-1992/alder forest, Berlese litter and twigs. Elev. 2310 m/HOLOTYPIC *Agathidium grandidentatum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Guerrero, 5.6 km SW Filo de Caballo, 2310 m.

DIAGNOSIS: This species can be distinguished from most species in this subgroup by the very large, acutely pointed male metafemoral tooth (fig. 141). The gula is unmodified. The male genitalia are relatively simple (figs. 252, 253). The lateral sulcus on the median lobe for reception of the lateral lobes is relatively indistinct compared with other members of the subgroup, though the lateral lobes are prominently sinuate (fig. 252). This species is extremely similar to *A. sejunctum* but specimens are smaller, are not generally iridescent dorsally, have the mesosternal carina entire, and exhibit some differences in shape of the male genitalia. In *A. sejunctum* there is a prominent dorsal lobe-like carinae alongside which is a large fovea in which fit the lateral lobes (fig. 249). This is much less distinct in *A. grandidentatum* (fig. 252).

DESCRIPTION: Body small (TBL = 2.00–2.32 mm), broad, robust, rounded (PNW/TBL = 0.44–0.46), strongly contractile.

Head and pronotum red-brown to piceous; elytra red-brown to piceous, not iridescent; venter yellow to red-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.53–0.70), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes compressed dorsoventrally; gula flat to slightly convex; antennomere ratios: length I:II:III = 1.4:1.0:1.3, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.73–0.84), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.87–0.98); punctuation and surface similar to pronotum; sutural stria present in apical one-fourth of elytron. Flight wings strongly reduced to absent. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.11–0.19), slightly concave medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed,

meeting medially in low, but prominent carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres slightly more, with moderate field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with very large, flat, acutely pointed tooth subapically on posterior margin (fig. 141); metasternal fovea large, transverse with large, dense brush of long fine setae. Median lobe in lateral aspect slender, moderately long, strongly curved basally, apical portion slender, distinctly flexed dorsad, apex abruptly curved ventrad, sharply pointed (fig. 252); in ventral aspect moderately broad, slightly expanded medially, apical portion evenly narrowed to pointed apex (fig. 251); operculum narrow, slightly tapered apically, apex distinctly and broadly emarginate (fig. 251); lateral lobes moderately broad, long, curved basally, slightly expanded and slightly sinuate apically, apices rounded with 2 stout setae (fig. 253).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Latin words *grandis*, meaning "large", and *dentatus*, meaning "tooth", for the large tooth on the metafemur of males of this species.

DISTRIBUTION: This species has been collected only from Guerrero (fig. 364).

PARATYPES: MEXICO: *Guerrero*: 15.0 km SW Filo de Caballo, 16 Jul 1992, 2500 m, wet oak forest litter, Berlese, RS Anderson (13, CNCI); 10.3 km SW Filo de Caballo, 13 Jul 1992, 2700 m, wet oak-pine-fir forest, leaf log litter, Berlese, R Anderson (75, CNCI).

DISCUSSION: This species has been collected from leaf and log litter from wet oak, pine, and fir forest at 2500–2700 m elevation.

Agathidium andersoni Miller and Wheeler,
new species
Figures 142, 254–256, 365

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "GUAT.SACATEPEQUEZ: 4.5 km SW San Miguel Duenas. Elev. 1760 m. mesic hardwd. for litter, R.Anderson 91-61, 12-VI-1991/HOLOTYPIC *Agathidium andersoni*

Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: Guatemala, Sacatepequez, 4.5 km SW San Miguel Duenas, 1760 m.

DIAGNOSIS: Members of this species have relatively large eyes and a small, subapical male metafemoral tooth (fig. 142). The metasternum is moderately broad medially. The species is best identified by examining the male genitalia, which has the median apical portion of the median lobe and the operculum each broadly truncate apically with a shallow medial emargination in ventral aspect (fig. 254). The operculum extends to about the apex of the apical portion of the median lobe (fig. 254). The lateral sulcus and associated carinae for reception of the lateral lobe are well developed (fig. 255).

DESCRIPTION: Body size relatively small (TBL = 2.58–2.90 mm), broad (PNW/TBL = 0.46–0.47), robust, strongly contractile.

Head and pronotum testaceous; elytra testaceous, with blue iridescence laterally; venter yellow-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.55–0.62), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula slightly concave; antennomere ratios: length I:II:III = 2.0:1.0:1.3, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.72), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.03–1.15); punctation similar to pronotum; sutural stria present in apical one-third of elytron. Flight wings fully developed. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum moderately narrow (MTL/MTW = 0.16–0.18), flattened, slightly sloping dorsad anteriorly; oblique femoral carinae well developed, moderately prominent medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, pro-

tarsomeres more so and with large ventral field of spatulate setae; mandibles not modified; metafemur broad, posterior apical angle produced into broad tooth, apical margin broadly rounded (fig. 142); metasternal fovea large, transversely oval, with dense, fine, long setae. Median lobe in lateral aspect abruptly bent basally, approximately straight thereafter, slender, distinctly expanded submedially along dorsal margin by lateral carina which together with dorsal carinae form a sulcus in which fits the lateral lobe, apical portion of median lobe short, slender, curved, gradually narrowed to narrowly rounded apex (fig. 252); in ventral aspect moderately robust, distinctly expanded submedially, apex broad, apically truncated with slight medial emargination (fig. 251); operculum long, extending to apex of median lobe, broadly curved ventrally, broad in ventral aspect, margins parallel, apex broad, truncate with slight medial emargination (fig. 251); lateral lobes long, slender, broadly and conspicuously expanded medially, apex slightly expanded in lateral aspect, in ventral aspect sinuate medially, abruptly narrowed subapically, with a single subapical seta (fig. 253).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for R.S. Anderson (Canadian Museum of Nature, Ottawa), who has contributed considerably to knowledge of Coleoptera through excellent research and valuable field work. He also collected the holotype specimen and many specimens of other *Agathidium*.

DISTRIBUTION: *Agathidium andersoni* has been collected from southern Mexico and Guatemala (fig. 365).

PARATYPES: GUATEMALA: *Baja Verapaz*: 8 km S Purulha, 20 May 1991, 1660 m, pine cloud forest litter, R Anderson (1, PECK). *Sacatepequez*: 4.5 km SW San Miguel Duenas, 12 Jun 1991, 1760 m, mesic hardwood forest litter, R Anderson (4, PECK).

MEXICO: *Chiapas*: Jitotol, 22 Sep 1986, 1500 m, leaf litter under *Salix*(?) shrubs, R Baranowski (1, LUND).

DISCUSSION: This species has been collected from litter under *Salix* shrubs, pine cloud forest and mesic hardwood forest litter from 1500 to 1760 m.

Agathidium disgregum Miller and Wheeler,
new species

Figures 143, 254–256, 365

TYPE MATERIAL: Holotype, ♂ in CNCI labeled "MEX. Cerro Potosi, NL V-3-1971, 8500' J.M. Campbell/HOLOTYPE *Agathidium disgregum* Miller and Wheeler, 2003 [red label with black line border]". Only a single specimen was examined of this species.

TYPE LOCALITY: Mexico, Nueva Leon, Cerro Potosi, 8500'.

DIAGNOSIS: This species is similar to *A. recurvatum* in most external characters except that the eyes are a little larger. The operculum of the median lobe is approximately T-shaped with broad lateral hooks apically (fig. 257), a condition unique in this species subgroup.

DESCRIPTION: Body relatively large (TBL = 3.81 mm), broad, robust (PNW/TBL = 0.48), strongly contractile.

Head red; pronotum dark red; elytra red, not iridescent; venter red-brown, antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.66), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes moderately large, not dorsoventrally compressed; gula slightly concave; antennomere ratios: length I:II:III = 2.2:1.0:2.2, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.69), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.02); punctuation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, flattened; medial carina well developed. Metasternum narrow (MTL/MTW = 0.18), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent laterally, medially meeting in low carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; man-

dibles not modified; metafemur moderately broad with small tooth subapically on posterior margin (fig. 143); metasternal fovea moderately large, rounded with moderately large pencil of long, dense, fine setae. Median lobe in lateral aspect slender basally, strongly curved, slightly expanded submedially, with prominent dorsal prominence and lateral carina with lateral sulcus in which fits the lateral lobe, apical portion elongate triangular, slightly sinuate apex abruptly hooked and sharply pointed (fig. 259); in ventral aspect slender, long, lateral margins broadly sinuate, apical portion evenly narrowed to slender, narrowly rounded apex (figs. 257, 258); operculum slender basally, very broadly expanded apically (fig. 257); lateral lobes slender, evenly curved through much of length, apically strongly sinuate and expanded submedially and apically, apex rounded with 2 stout setae (fig. 260).

Female not examined.

ETYMOLOGY: Name from the Latin word *disgregus*, meaning "different", for the unusual shape of the male operculum.

DISTRIBUTION: This species is known only from the type locality (fig. 365).

DISCUSSION: A single altitude record is from 8500 ft.

Agathidium oaxacaense Miller and

Wheeler, new species

Figures 144, 261–263, 365

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX: Oax.; 37 mi Valle Nacional 8500' 24.V.71 oak litter Ber 206 S. Peck/HOLOTYPIC *Agathidium oaxacaense* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Oaxaca, 37 mi S Valle Nacional.

DIAGNOSIS: This species is externally similar to several species in the *A. aztec* subgroup. The eyes are moderately dorsoventrally compressed with facets of moderate size. The male metafemoral tooth is moderately large, anteapical, and there is a series of smaller serrations along the posterior margin of the metafemur (fig. 144). The male genitalia are very distinctive with the median lobe very robust and strongly curved (fig. 262). There is a very prominent dorsomedial

carina with a prominent lateral fovea that receives the lateral lobe (fig. 262).

DESCRIPTION: Body moderately small (TBL = 2.54–3.16 mm), broad, robust (PNW/TBL = 0.46–0.53), strongly contractile.

Head and pronotum testaceous; elytra testaceous, slightly iridescent in some specimens; venter, antennae, palpi, and legs dark brown.

Head broad (MDL/OHW = 0.53–0.60), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes slightly compressed, but not strongly reduced; gula slightly concave; antennae moderately long (ratios: length I:II:III = 1.9:1.0:1.7, width VII:VIII:IX = 1.0:1.0:1.8). Pronotum very large, broad (PNL/PNW = 0.64–0.75), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.87–1.23); punctuation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, not declivitous, flattened; medial carina well developed. Metasternum moderately narrow (MTL/MTW = 0.13–0.17), sloping dorsad anteriorly and concave medially; oblique femoral carinae prominent, meeting medially in large, semicircular flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with prominent subapical tooth on posterior margin and numerous smaller serrations along posterior margin (fig. 145); metasternal fovea linear, transverse with line of dense, fine setae. Median lobe in lateral aspect short, very robust, abruptly curved basally, broadly expanded submedially due to dorsal production of dorsomedial carina, with large fovea laterad of carina for reception of lateral lobe, apical portion of median lobe slender, apically pointed, slightly hooked ventrally (fig. 262); in ventral aspect robust, lateral margins subparallel for most

of length, abruptly narrowed subapically, apex a slender, narrowly rounded process (fig. 261); operculum in lateral aspect slender basally, abruptly expanded apically, in ventral aspect short, broad, broadly rounded, apex slightly emarginate (fig. 261); lateral lobes slender basally, strongly expanded submedially, expanded portion fitting into cavity on each side of median lobe, apical portion strongly sinuate, apex broadly expanded, apically rounded, with 2 stout apical setae (fig. 263).

Female tarsi 5-4-4.

ETYMOLOGY: Named for the state in Mexico in which this species is found.

DISTRIBUTION: This species is known only from the state of Oaxaca (fig. 365).

PARATYPE: MEXICO: *Oaxaca*: 37 mi S Valle Nacional, 24 May 1971, 8500', oak litter, S Peck (5, PECK).

DISCUSSION: The type series was collected from oak litter at 8500 ft.

Agathidium oculeum Miller and Wheeler,
new species

Figures 108, 145, 264–266, 366

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEXICO: Chiapas: Volcan Tacana, lower slopes, ca. 4 km N Union Juarez. 18-IX-1992. R.S. Anderson 92-109/cloud forest litter Elev. 1950 m./HOLOTYPE *Agathidium oculeum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Chiapas, lower slopes of Volcan Tacana, ca. 4 km N Union Juarez, 1950 m.

DIAGNOSIS: This species is very similar to *A. recurvatum* but the eyes are much more prominent, protruding, and finely faceted (fig. 108). The male genitalia are also similar to that species but differ in that the operculum is broader and more rounded in *A. oculeum* (fig. 264) than in *A. recurvatum* (fig. 267).

DESCRIPTION: Body moderately large (TBL = 2.82–3.97 mm), broad, robust (PNW/TBL = 0.44–0.48), rounded, strongly contractile.

Head and pronotum red-brown; elytra red-brown, not iridescent; venter, antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.64), dorsal surface flattened, dorsoventrally compressed;

with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes large with many facets, not reduced (fig. 108); gula slightly convex medially; antennomere ratios: length I:II:III = 2.1:1.0:1.8, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.73–0.76), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.03–1.20); punctuation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.12–0.16), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately developed, not prominent, low where meeting medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small tooth subapically along posterior margin (fig. 145); metasternal fovea moderately large, transverse with line of fine, dense, long setae. Median lobe in lateral aspect slender, moderately short, strongly curved medially, apical portion long, slender, sinuate, apex sharply pointed, recurved ventrad (fig. 265); in ventral aspect slender, apical portion with margins sinuate, converging, apex slightly expanded and pointed apically (fig. 264); operculum flat, short, narrow basally, expanded apically, apex emarginate, each ramus broad and apically pointed (fig. 264); lateral lobes long, slender, not expanded, sinuate, apex narrowly rounded with 2 stout setae (fig. 266).

Female not examined.

ETYMOLOGY: Named for the Latin word *oculus*, meaning "full of eyes", for the large, many faceted eyes of members of this species.

DISTRIBUTION: This species has been collected from San Luis Potosi and Chiapas (fig. 366).

PARATYPES: MEXICO: *Chiapas*: 10 mi SE San Cristobal de las Casas, 1 Sep 1993, 8000', pine-madron-oak forest litter, Berlese, A Newton (4, FMNH); Pico Cerro Tzontehuitz, 10 km NE San Cristobal, 16 Sep 1991, 2910 m, cloud forest litter, RS Anderson (1, CNCI).

DISCUSSION: This species has been collected from cloud forest litter and leaf and log litter from *Liquidambar*, pine, oak, and madrone forests. Elevation records are from 4800 to 8000 ft.

Agathidium recurvatum Miller and Wheeler, new species
Figures 146, 267–269, 366

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX.: OAX.; 3 mi N Suchixtepec, 9500' 4.vi.1971 S.Peck Ber209, oak litter/HOLOTYPE *Agathidium recurvatum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Oaxaca, 3 mi N Suchixtepec, 9500'.

DIAGNOSIS: This species is similar to *A. aztec* and related species in having a small, subapical male metafemoral tooth (fig. 146), but differs in having relatively smaller eyes with somewhat larger facets, more well-developed oblique metasternal carinae which meet medially in a moderately developed triangular lobe and the male genitalia. The median lobe in lateral aspect is apically slender, long, and sharply recurved at the apex (fig. 268). This species is similar to *A. oculeum* but has smaller eyes and that species has a very broad, rounded operculum (fig. 264) whereas that of *A. recurvatum* is smaller and more slender (fig. 267). This species is also similar to *A. stenomma* (including the shape of the male genitalia); however, that species has eyes that are very strongly dorsoventrally compressed (fig. 109).

DESCRIPTION: Body moderate in size (TBL = 2.68–3.82 mm), broad, robust (PNW/TBL = 0.44–0.48), strongly contractile.

Head dark red-brown to piceous; pronotum dark red-brown to piceous, red around margins; elytra red-brown to piceous, red around margins, not iridescent; venter, antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.52–0.63), dorsal surface flattened, dorsoventrally com-

pressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes moderately large, but distinctly dorsoventrally compressed; gula slightly concave; antennomere ratios: length I:II:III = 1.8:1.0:1.9, width VII:VIII:IX = 1.0:1.0:1.5. Pronotum very large, broad (PNL/PNW = 0.73–0.83), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.93–1.11); punctuation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, flattened; medial carina well developed. Metasternum narrow (MTL/MTW = 0.14–0.22), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent laterally, medially meeting in moderately prominent, posteriorly directed lobe.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad with broad, moderately large tooth subapically on posterior margin (fig. 146); metasternal fovea moderately large, rounded with moderately large pencil of long, dense, fine setae. Median lobe in lateral aspect slender basally, strongly curved, expanded submedially, with prominent dorsal prominence, apical portion elongate triangular, apex abruptly recurved and sharply pointed (fig. 268); in ventral aspect slender, long, lateral margins broadly sinuate, apical portion evenly narrowed to slender, sharply pointed apex (fig. 267); operculum flat, long, relatively slender, apex emarginate, each ramus narrowly rounded (fig. 267); lateral lobes slender, evenly curved through much of length, apically strongly sinuate and slightly broadened, apex rounded with 2 stout setae (fig. 269).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named *recurvatum* after the prominently recurved apex of the median lobe in lateral aspect.

DISTRIBUTION: This species is known only

from the states of Mexico and Oaxaca (fig. 366).

PARATYPES: MEXICO: *Oaxaca*: 23 km N Oaxaca City, 12 Sep 1994, 2650 m, under bushes at roadside, mixed pine forest, R Baranowski (13, JRAC); 26 km S Yolomecatl, 10 Aug 1988, Doyen and Stockwell (1, EMEC); 17 km N Villa Diaz Ordaz, 5 Sep 1994, 2750 m, pine oak forest litter, R Baranowski (5, JRAC); 40.5 km S Suchixtepec, 25 Jul 1992, 1300 m, cloud forest, leaf litter, Berlese, RS Anderson (2, CNCI); 64.5 km SW Valle Nacional km 117.5, 28 Jul 1992, 2600 m, oak forest leaf litter, Berlese, RS Anderson (3, CNCI); 5.1 km S Suchixtepec, 25 Jul 1992, oak-alder-pine forest leaf litter, Berlese, RS Anderson (7, CNCI); 4.6 km S Suchixtepec, 23 Jul 1992, 2150 m, wet riparian alder forest leaf litter, Berlese, RS Anderson (7, CNCI); 3.5 mi S Suchixtepec, 3 Jun 1971, 8000', leaf litter, S Peck (4, PECK).

DISCUSSION: This species has been collected from litter from various forest types including pine, oak, alder, and wet riparian forest.

Agathidium impensum Miller and Wheeler,
new species

Figures 147, 270–272, 366

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEXICO: Guerrero: 15.0 km SW Filo de Caballo, R.S.Anderson 92-011 16-VII-1992/oak forest (wet) litter Berlese. Elev. 2600 m/HOLOTYPIC *Agathidium impensum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Guerrero, 15.0 km SW Filo de Caballo.

DIAGNOSIS: This species is characterized by its very large size (approaching the size of *A. megoniscoides* and *A. oniscoides*), moderately large, curved apical male metafemoral tooth (fig. 147), and very distinctive male genitalia (figs. 270–272). The median lobe is very long with the apical portion very slender and straight and with very prominent dorsal and lateral carinae for reception of the lateral lobe (fig. 271). The operculum is broad (fig. 270) and apically hooked ventrad (fig. 271).

DESCRIPTION: Size large (TBL = 4.21–4.73 mm), body broad (PNW/TBL = 0.46–0.47), robust, rounded, strongly contractile.

Head and pronotum yellow-red; elytra yellow-red, distinctly iridescent; venter yellow-

brown to red-brown; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.52–0.61), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes prominent, not strongly compressed; gula shallowly concave; antennae moderately long; antennomere ratios: length I:II:III = 2.4:1.0:2.1, width VII:VIII:IX = 0.9:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.78–0.79), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.04–1.19); punctation and surface similar to pronotum; sutural stria present in apical one-fourth of elytron. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.14–0.17), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, meeting medially in low carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres only moderately laterally expanded, with moderate field of ventral spatulate setae; mandibles not modified; metafemur moderately slender, with curved, robust, large tooth apically (fig. 147); metasternal fovea large, transverse, with dense brush of long fine setae. Median lobe in lateral aspect robust, evenly curved, at base of apical portion with lateral lobelike carinae, apical portion narrowed, straight, slightly expanded along ventral margin (fig. 271); in ventral aspect slender, apical portion with lateral margins irregular, narrowed, apex a slender, apically rounded process (fig. 270); operculum in lateral aspect flat, apically hooked ventrad (fig. 271), in ventral aspect broad, apex broad with narrow medial emargination, each ramus of operculum rounded apically (fig. 270); lateral lobes long, curved basally, apical one-fifth expanded and sinuate, apices rounded, each with 2 stout setae (fig. 172).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Latin word *impensus*, meaning “large”, for the relatively large size of specimens.

DISTRIBUTION: This species is known only from the type locality in Guerrero (fig. 366).

PARATYPE: MEXICO: *Guerrero*: 15 km SW Filo de Caballo, 16 Jul 1992, wet forest litter, RS Anderson (1, CNCI).

DISCUSSION: The type specimens were extracted from wet oak forest litter using a Berlese device. They were collected from 2600 m elevation.

Agathidium cheneyi Miller and Wheeler,
new species

Figures 148, 273–276, 366

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEXICO: Chiapas: Yerbabuena Preserve 2.1 km NW Pueblo Nuevo, Solistahuacan. R.S. Anderson 92-114 23-IX-1992/HOLOTYP *Agathidium cheneyi* Miller and Wheeler, 2003 [red label with black line border]”. The holotype is the only specimen examined of this species.

TYPE LOCALITY: Mexico, Chiapas, Yerbabuena Preserve, 2.1 km NW Pueblo Nuevo, Solistahuacan.

DIAGNOSIS: This species is similar to *A. aztec* and related species. This species differs in the greater development of the oblique metasternal carinae which meet medially in a very broad, truncate flange. The median lobe differs particularly in having the operculum very short and laterally rounded with a distinct apical emargination (fig. 273).

DESCRIPTION: Body moderately small (TBL = 3.26 mm), broad, robust, rounded (PNW/TBL = 0.47), strongly contractile.

Head and pronotum red; elytra red, iridescent; venter yellow-red; antennae, palpi, and legs yellow-brown.

Head broad (MDL/OHW = 0.58), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes moderately large, slightly compressed dorsoventrally; gula flat; antennomere ratios: length I:II:III = 1.6:1.0:1.5, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.71), strongly convex, anterolateral

lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.07); punctation and surface similar to pronotum; sutural stria present in apical one-fifth of elytron. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.16), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae moderately well developed, meeting medially in broadly truncate carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with moderately large ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small tooth subapically on posterior margin (fig. 148); metasternal fovea large, transversely oval with large region of long fine setae. Median lobe in lateral aspect slender, strongly curved basally, with moderate lateral and dorsal carinae at base of apical portion for reception of lateral lobe, apical portion slender, sinuate, apex very narrowly truncate (fig. 275); in ventral aspect slender, expanded at base of apical portion that has the lateral margins slightly sinuate and convergent to near apex, which is slightly expanded and rounded (figs. 273, 274); operculum broad, short, flat, with shallow V-shaped emargination apically (fig. 273); lateral lobes slender, apically sinuate, apex narrowly rounded with 2 stout setae (fig. 276).

Female not examined.

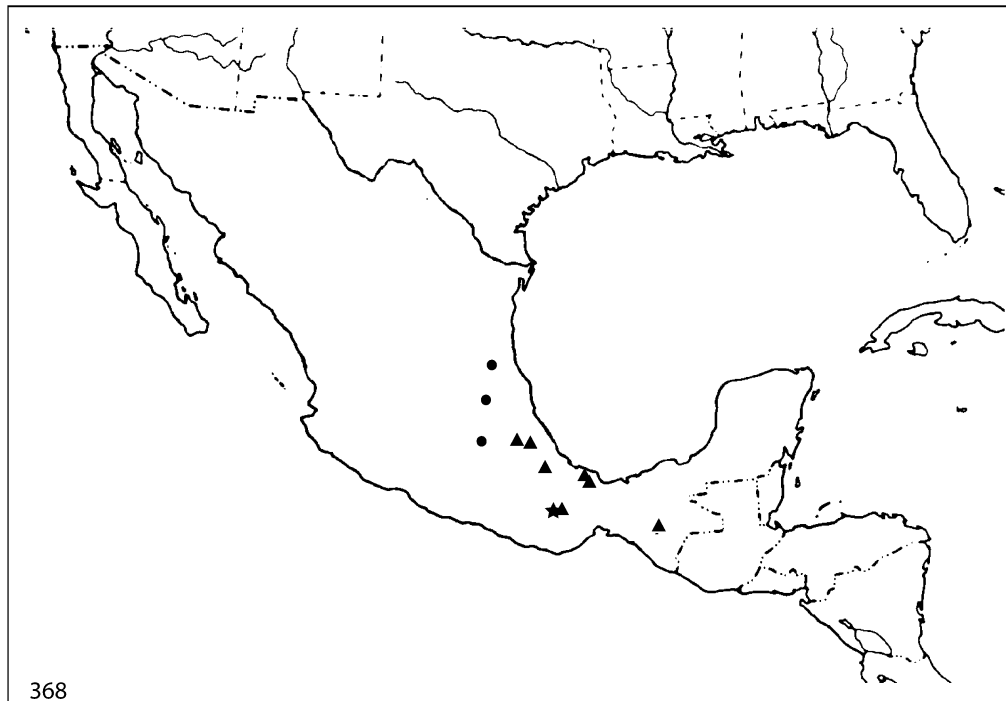
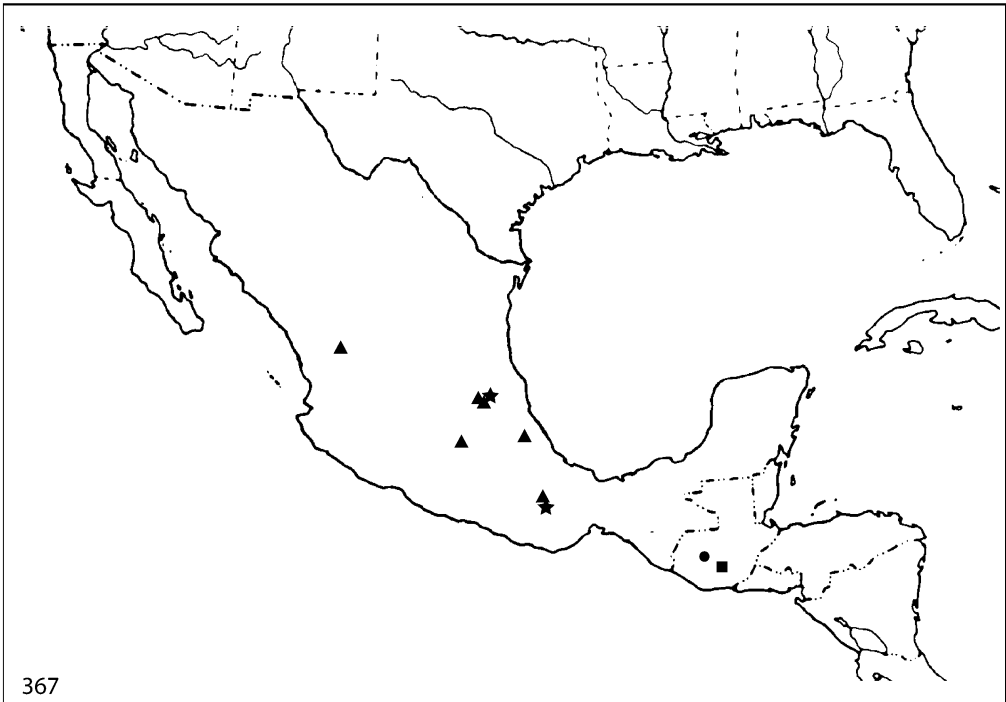
ETYMOLOGY: This species is named in honor of R.B. Cheney (Casper, WY), Vice-President of the United States.

DISTRIBUTION: This species is known only from Chiapas (fig. 366).

Agathidium tenangoense Miller and
Wheeler, new species

Figures 149, 277–279, 367

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “GUAT: HUEHUETENANAGO 10 kmW La Capellania 3.viii.78. Helava./HOLOTYP *Agathidium tenangoense* Miller



Figs. 367, 368. Geographic distribution of *Agathidium oniscoides*-group species: 367, *A. hirsutum* = ■; *A. tenangoense* = ●; *A. iridescens* = ▲; *A. rumsfeldi* = ★. 368, *A. aztec* = ▲; *A. cortezi* = ★; *A. tumidiventre* = ●.

and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Guatemala, Huehuetenango, 10 km W La Capellania.

DIAGNOSIS: This species is similar to other members of the *A. aztec* subgroup with a small male metafemoral tooth (fig. 149). The eyes are relatively prominent, the metasternum is flat with a small, medial fovea in the male and has indistinct oblique carinae, the gula is unmodified, and the elytra are conspicuously iridescent. The male genitalia are diagnostic with the apical portion of the median lobe broad basally and strongly constricted to a stout, short apically truncate apical process (fig. 277). The operculum is broad, long and apically broadly subtruncate with a small apical emargination (fig. 277).

DESCRIPTION: Body moderate in size (TBL = 3.72 mm), broad, robust (PNW/TBL = 0.48), strongly contractile.

Head piceous; pronotum piceous, dark red around margins; elytra piceous, red around margins, prominently iridescent laterally; venter dark red-brown, piceous on metasternum, antennae and palpi dark red-brown; legs red-brown.

Head broad (MDL/OHW = 0.63), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes moderately large, not dorsoventrally compressed; gula slightly concave; antennomere ratios: length I:II:III = 1.7:1.0:1.8, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.73), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.08); punctuation similar to pronotum; sutural stria present in apical one-third of elytron. Flight wings fully developed. Mesosternum narrow medially (MTL/MTW = 0.18), broadly rounded; medial carina well developed. Metasternum moderately broad, flat, sloping dorsad anteriorly, smooth and relatively glabrous; oblique femoral carinae indistinct, medially meeting in very low carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad with small, indistinct tooth subapically on posterior margin (fig. 149); metasternal fovea small, slightly transverse with small pencil of dense, fine setae. Median lobe in lateral aspect slender and strongly curved basally, slightly expanded submedially, with prominent lateral carinae with lateral sulcus in which fits the lateral lobe, apical portion slightly angled dorsad, stout, slender, apically slightly expanded (fig. 278); in ventral aspect slender, long, slightly constricted submedially, laterally expanded at base of apical portion by lateral carinae, apical portion broad basally, abruptly narrowed, with apex consisting of stout, truncated process (fig. 277); operculum long, flat, broad, stout, apically broadly subtruncate with small medial emargination (fig. 277); lateral lobes slender basally, curved basally, apically distinctly sinuate and expanded submedially and apically, apex rounded with 2 stout setae (fig. 279).

Female not examined.

ETYMOLOGY: This species is named after an abbreviated form of the name of the type locality in Guatemala.

DISTRIBUTION: This species is known only from the type locality in Guatemala (fig. 367).

PARATYPE: GUATEMALA: *Huehuetenango*: 10 km W LaCapellania, 3 Aug 1978, Helava (1, CNCI).

Agathidium rumsfeldi Miller and Wheeler,
new species

Figures 150, 280–283, 367

TYPE MATERIAL: Holotype, ♂ in FMNH labeled “MEXICO: Hidalgo 2.5 mi N Tlanchinol, 5200 ft vii.6–11.1973/white polypore tree fungus A. Newton/HOLOTYPE *Agathidium rumsfeldi* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Hidalgo, 2.5 mi N Tlanchinol, 5200’.

DIAGNOSIS: This species is extremely similar to *A. aztec* and related species. The elytra are slightly iridescent. This species can be distinguished by the shape of the median lobe which has the operculum with a small,

apical V-shaped emargination and each ramus flared laterally and distinctly pointed (fig. 280). Other differences are only slight shape differences in the median lobe (figs. 280–282).

DESCRIPTION: Body moderately small (TBL = 2.73–3.03 mm), broad, robust, rounded (PNW/TBL = 0.45–0.49), strongly contractile.

Head and pronotum red; elytra red, slightly iridescent; venter red-yellow; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.61–0.66), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes not reduced, not dorsoventrally compressed; gula flat; antennomere ratios: length I:II:III = 1.6:1.0:1.3, width VII:VIII:IX = 1.0:1.0:2.3. Pronotum very large, broad (PNL/PNW = 0.67–0.76), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.01–1.05); punctuation and surface similar to pronotum; sutural stria present only at apex of elytron. Flight wings present, fully developed. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.16), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae low, not prominent where meeting medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small tooth subapically along posterior margin (fig. 150); metasternal fovea moderately large, oval with large brush of fine, long setae. Median lobe in lateral aspect slender, basally strongly curved, apical portion curved, slender, apically pointed, slightly expanded subapically, with lateral and dorsal carinae at base of apical portion between which fit the lateral lobes (fig. 282); in ventral aspect slender, at base of apical portion with prominent lateral lobes, apical

portion evenly tapered for most of length, subapically slender, apex expanded (figs. 280, 281); operculum in lateral aspect curved ventrad, slender (fig. 282), in ventral aspect moderately broad, apex medially with V-shaped, shallow emargination, apices of rami pointed and divergent (fig. 280); lateral lobes moderately slender, curved basally, sinuate apically, medially abruptly expanded, apex expanded, rounded with 2 stout setae (fig. 283).

Female not examined.

ETYMOLOGY: Named after D. Rumsfeld (Taos, NM), Secretary of Defense of the United States.

DISTRIBUTION: *Agathidium rumsfeldi* is known only from Hidalgo and Oaxaca (fig. 367).

PARATYPE: MEXICO: *Oaxaca*: 27.3 mi N Ixtlan de Juarez, 10 Aug 1973, 9200', under oak bark, A Newton (1, FMNH).

DISCUSSION: This species has been collected from under oak bark at 5200–9200 ft elevation.

Agathidium hirsutum Miller and Wheeler,
new species

Figures 151, 284–287, 367

TYPE MATERIAL: Holotype, ♂ in MZLU labeled “Guatemala: 5 km E Antigua Guatemala 1780 m. 7.XII.1991 leg. R. Baranowski/sifting litter near stream in ravine, tropical montane forest/HOLOTYPE *Agathidium hirsutum* Miller and Wheeler, 2003 [red label with black line border]”. Only a single specimen is known of this species.

TYPE LOCALITY: Guatemala, 5 km E Antigua Guatemala.

DIAGNOSIS: This species is similar to other members of the *A. aztec* subgroup with a small male metafemoral tooth (fig. 151), moderately large eyes, and general lack of distinctive modifications. This species has an extremely large, setose male metasternal fovea that is very conspicuous. The male genitalia are also diagnostic with the operculum moderately broad and apically slightly emarginate (fig. 284).

DESCRIPTION: Body moderately large (TBL = 2.35 mm), broad, robust (PNW/TBL = 0.56), strongly contractile.

Head red; pronotum dark red; elytra dark

red, not iridescent; venter yellow-brown, antennae and palpi yellow; legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.52), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not compressed, finely faceted; gula slightly concave; antennomere ratios: length I:II:III = 2.0:1.0:2.0, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large, broad (PNL/PNW = 0.58), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.87); punctuation similar to pronotum; sutural stria present in apical one-fourth of elytron. Flight wings present, fully developed. Mesosternum broad, flattened; medial carina present and well developed. Metasternum moderately narrow (MTL/MTW = 0.12), relatively strongly concave, sloping dorsad anteriorly; oblique femoral carinae moderately prominent, low and concave where meeting medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad with small posteroapical tooth (fig. 151); metasternal fovea exceptionally large, rounded, medial, with very large cluster of long, dense, fine setae. Median lobe in lateral aspect moderately slender, moderately long, strongly curved basally, relatively straight thereafter, expanded submedially on dorsal margin and with lateral carinae between which is a sulcus which receives the lateral lobe, apical portion directed slightly dorsally, evenly curved, slender throughout length, apex sharply pointed (fig. 286); in ventral aspect slender, slightly constricted medially, distinctly expanded submedially by lateral carinae, apical portion broad basally, narrowed to constricted neck, thereafter slightly expanded and apex rounded (figs. 284, 285); operculum long and with lateral margins broadly curved in ventral aspect, with apex slightly expanded laterally and with small

apical emargination (fig. 284); lateral lobes slender, strongly curved basally, apically expanded and strongly sinuate, apex narrowly rounded with 2 subapical stout setae (fig. 287).

Female not examined.

ETYMOLOGY: Named from the Latin word *hirsutus*, meaning "hairy", for the setose metasternum in this species.

DISTRIBUTION: This species is known only from the type locality in Guatemala (fig. 367).

DISCUSSION: The single type specimen was collected from "litter near a small stream in tropical montane forest" at 1780 m elevation.

Agathidium cortezi Miller and Wheeler,
new species
Figures 152, 288–291, 368

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEX.: OAX.; 52 mi N Oaxaca, 9500' 17.v.71 S. Peck Ber202, leaflit./HOLOTYPE *Agathidium cortezi* Miller and Wheeler, 2003 [red label with black line border]". The only specimen examined of this species is the holotype.

TYPE LOCALITY: Mexico, Oaxaca, 52 mi N Oaxaca.

DIAGNOSIS: This species is nearly identical to *A. aztec* externally (see the "Diagnosis" under that species). However, *A. aztec* is generally not iridescent, whereas the single specimen of *A. cortezi* is distinctly iridescent on the elytra. The main difference is in the shape of the median lobe. In *A. cortezi* the apical portion of the median lobe in ventral aspect is narrowed for a greater portion of its length, the operculum is broader and with the lateral margins more strongly curved, and the apex is more shallowly emarginate (fig. 288). Nevertheless, given additional specimens, it may be found that these features are within the realm of variation exhibited by *A. aztec*, though we maintain these specimens in different species at this time.

DESCRIPTION: Body large (TBL = 3.87 mm), broad, robust (PNW/TBL = 0.46), strongly contractile.

Head and pronotum testaceous; elytra testaceous, iridescent; venter yellow-brown, an-

tennae and palpi yellow; legs yellow to yellow-brown.

Head broad ($MDL/OHW = 0.55$), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not compressed; gula slightly concave anteriorly; antennomere ratios: length I:II:III = 1.6:1.0:1.8, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large, broad ($PNL/PNW = 0.75$), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded ($SEL/ELW = 1.19$); punctuation similar to pronotum; sutural stria present in apical one-half of elytron. Flight wings strongly reduced. Mesosternum broad, flattened; medial carina present, but low and not strongly developed. Metasternum moderately broad ($MTL/MTW = 0.20$), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent, low and convex medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, protarsomeres more so and with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad with posteroapical tooth and series of smaller teeth, apical margin rounded to truncate (fig. 152); metasternal fovea large, transversely oval, medial, with cluster of long, dense, fine setae. Median lobe in lateral aspect long, slender, strongly curved basally, with prominent lateral carinae at base of apical portion for reception of lateral lobe, apical portion directed at angle dorsad, curved, apex slightly expanded, rounded (fig. 290); in ventral aspect slender, narrowed medially, apical portion expanded basally, apex a long, slender process, very slightly expanded at apex (figs. 288, 289); operculum in lateral aspect long, slender basally, expanded in apical half, apex rounded and directed ventrad (fig. 290), in ventral aspect moderately broad with lateral margins rounded, apex slightly emarginate medially (fig. 288); lateral lobes slender, strongly curved basally, sinuate, expanded medially, apex curved and slender to narrow-

ly rounded apex, with 2 stout subapical setae (fig. 291).

Female not examined.

ETYMOLOGY: This species is named after the great Spanish explorer and conquistador Hernan Cortez who explored much of Mexico, conquered the local regime, and whose deeds and motivations remain somewhat controversial.

DISTRIBUTION: This species is known only from the type locality in Oaxaca (fig. 368).

DISCUSSION: The single known specimen was collected from leaf litter.

Agathidium tumidiventre Miller and
Wheeler, new species
Figures 153, 292–295, 368

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEX: Tamps; 1000 m nr Gomez Farias 7.VIII.83, S&J. Peck cloudforest litter/HOLOTYPE *Agathidium tumidiventre* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Tamaulipas, nr Gomez Farias, 1000 m.

DIAGNOSIS: Members of this species have a relatively small, antepical male metafemoral tooth (fig. 153), moderately broad metasternum with a low posterior carina where the oblique metasternal carinae meet medially, relatively large, finely faceted eyes, and prominent medial tumidity on the gula. Specimens are generally not iridescent dorsally, though a few are. This is one of several species that are positively identifiable only by dissection of male genitalia. In this species the median lobe has moderately developed dorsal and lateral carinae for reception of the lateral lobes, and the apical portion of the median lobe is evenly curved in lateral aspect (fig. 294) and relatively evenly narrowed to a slightly expanded apex in ventral aspect (fig. 292). The operculum is fairly long and slender and has the apex rounded with a prominent, but shallow, apical emargination (fig. 292). The species is nearly identical to *A. aztec*, including genitalic shape, except for the lack in that species of a distinct tumidity medially on the gula.

DESCRIPTION: Body moderately large (TBL = 3.40–3.57 mm), broad, robust (PNW/TBL = 0.48), strongly contractile.

Head and pronotum testaceous; elytra testaceous, iridescent; venter yellow-brown, antennae and palpi yellow; legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.57–0.62), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not compressed; gula with very prominent median tumidity; antennomere ratios: length I:II:III = 2.1:1.0:2.2, width VII:VIII:IX = 1.0:1.0:1.4. Pronotum very large, broad (PNL/PNW = 0.77), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.96–0.99); punctation similar to pronotum; sutural stria present in apical one-fifth to one-half of elytron. Flight wings strongly reduced. Mesosternum broad, flattened; medial carina present, but low and not strongly developed. Metasternum relatively narrow (MTL/MTW = 0.13–0.17), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent, low and convex medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad with posteroapical tooth and series of smaller teeth, apical margin rounded to truncate (fig. 153); metasternal fovea large, transversely oval, medial, with cluster of long, dense, fine setae. Median lobe in lateral aspect moderately slender, moderately long, strongly curved basally, moderately expanded submedially on dorsal margin with moderately developed lateral sulcus for reception of lateral lobe, apical portion of median lobe directed slightly dorsad, straight, slightly expanded medially, apex pointed (fig. 294); in ventral aspect slender, slightly constricted medially, distinctly expanded submedially, apical portion narrowed to constricted neck, thereafter, expanded and apex rounded (fig. 292, 293); operculum long and slender in lateral aspect, apically pointed (fig. 294), in ventral aspect long with lateral margins sub-

parallel, apex distinctly and moderately broadly emarginate (fig. 292); lateral lobes slender, strongly curved basally, sinuate, expanded medially, apex curved and slender to narrowly rounded (fig. 295).

Female 5-4-4.

ETYMOLOGY: This species is named for the Latin words *tumidus*, meaning “swelling”, and *ventris*, meaning “belly”, for the prominent medial tumidity on the ventral surface of the gula.

DISTRIBUTION: This species has been collected from Hidalgo and Tamaulipas (fig. 368).

PARATYPES: MEXICO: *Hidalgo*: 6.5 mi S Tianguistengo, 7 Jul 1973, 6800', on “gilled mushroom”, A Newton (1, FMNH); *Tlanchinol*, 43 km SW Huejutla, 14 Jun 1983, 1500', cloud forest litter, S and J Peck (5, PECK). *Tamaulipas*: nr. Gomez Farlas, Rancho del Cielo, 6 Jun 1983, 1000 m, cloud forest, FIT, S and J Peck (6, PECK).

DISCUSSION: The species has been collected from cloud forest litter at 1500–6800 ft and from a “gilled mushroom”.

Agathidium aztec Miller and Wheeler,
new species

Figures 105, 154, 296–298, 368

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “MEX; Pue; 24 km N Xicotepec de Juarez 17.VI.83, 1070 m R.Anderson.oak forest litter/HOLOTYPE *Agathidium aztec* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: Mexico, Puebla, 24 km N Xicotepec de Juarez, 1070 m.

DIAGNOSIS: Members of this species have a relatively small, anteapical male metafemoral tooth (fig. 154), moderately broad metasternum with a low posterior carina where the oblique metasternal carinae meet medially, relatively large, finely faceted eyes and undifferentiated gula. Specimens are generally not dorsally iridescent, though a few are. This is one of several clearly closely related species that are positively identifiable only by dissection of male genitalia. In this species the median lobe has moderately developed dorsal and lateral carinae for reception of the lateral lobes, and the apical portion of the median lobe is evenly curved in lateral aspect (fig. 297) and relatively evenly nar-

rowed to a slightly expanded apex in ventral aspect (fig. 296). The operculum is fairly long and slender and has the apex rounded with a prominent, but shallow, apical emargination (fig. 296). The species is nearly identical to *A. tumidiventre*, including genitalic shape, except for the presence in that species of a distinct tumidity medially on the gula.

DESCRIPTION: Body moderately large (TBL = 3.29–3.64 mm), broad, robust (PNW/TBL = 0.47–0.48), strongly contractile.

Head and pronotum testaceous; elytra testaceous, not or only faintly iridescent; venter yellow-brown, antennae and palpi yellow; legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.50–0.53), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not compressed; gula flat to slightly concave; antennomere ratios: length I:II:III = 2.1:1.0:2.2, width VII:VIII:IX = 1.0:1.0:1.7. Pronotum very large, broad (PNL/PNW = 0.80–0.81), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad (SEL/ELW = 0.97–1.12); lateral margins strongly rounded, apically rounded; punctation similar to pronotum; sutural stria present in apical one-fifth to one-half of elytron. Flight wings strongly reduced to absent. Mesosternum broad, flattened; medial carina present, but low and not strongly developed. Metasternum relatively narrow (MTL/MTW = 0.14–0.16), flattened, sloping dorsad anteriorly; oblique femoral carinae moderately prominent, low and convex medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad with posteroapical tooth and series of smaller teeth, apical margin rounded to truncate (fig. 154); metasternal fovea large, transversely oval, medial, with cluster of long, dense, fine setae. Median lobe in lateral aspect moderately slender, moderately long, strongly curved basally, moderately expanded submedially on dorsal margin, apical por-

tion directed slightly dorsally, straight, slightly expanded medially, apex pointed (fig. 297); in ventral aspect slender, slightly constricted medially, distinctly expanded submedially, apical portion narrowed to constricted neck, thereafter expanded and apex rounded (fig. 296); operculum long and slender in lateral aspect, apically pointed (fig. 297), in ventral aspect long with lateral margins subparallel, apex emarginate (fig. 296); lateral lobes slender, strongly curved basally, sinuate, expanded medially, apex curved and slender to narrowly rounded apex (fig. 298).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named for the Aztecs, a group of people who engaged in human sacrifice, dominated central Mexico through military subjugation of their enemies, and were slaughtered and forced to serve Spain by the conquistador Cortez.

DISTRIBUTION: This species is known from central and southern Mexico (fig. 368).

PARATYPES: MEXICO: *Chiapas*: 8 km SE San Cristobal, 28 Sep 1986, 2400 m, litter at logs, fungus, pine-oak forest, on fungus, R Baranowski (3, LUND). *Oaxaca*: 40.5 km S Suchixtepec, 25 Jul 1992, 1300 m, cloud forest leaf litter, Berlese, RS Anderson (3, CNCI); 6 mi S Valle Nacional, 19 May 1971, 2000', leaf litter, S Peck (1, PECK); 40 km SW Valle Nacional km 93, 26 Jul 1992, 1900 m, oak forest leaf litter, RS Anderson (2, CNCI); 5 mi S Valle Nacional, 19 May 1971, 2000', leaf litter, S Peck (1, PECK). *Puebla*: 24 km N Xicotepec de Juarez, 17 Jun 1983, oak forest litter, R Anderson (1, PECK). *Vera Cruz*: 4.4 mi N Huatusco, 29 Jul 1973, 4200', cloud forest, Newton (1, FMNH); 5 km NE Coscomatepec, 22 Jun 1983, 1130 m, cloud forest litter, Anderson and Peck (9, PECK); 5 km NE Coscomatepec, 22 Jun 1983, 1130 m, cloud forest litter, Anderson and Peck (1, PECK); 6 mi NE Catemaco, 7 Jul 1976, 1500', rain forest leaf litter, Newton (1, FMNH); 7 km E Huatusco, 22 Jun 1983, cloud forest litter, Anderson and Peck (2, PECK); Lake Catemaco, 1 May 1969, JM Campbell (1, CNCI).

DISCUSSION: This species has been collected from cloud forest litter and litter in pine and oak forests. Elevation records are from 1500 to 4200 ft.

Agathidium iridescens Miller and Wheeler,
new species

Figures 155, 299–302, 367

TYPE MATERIAL: Holotype, ♂ in FMNH labeled "MEX: S.L.P.14 mi.W Xilitla 4800'

VI.29.73 A. Newton/leaf & log litter non-coniferous *Liquidambar* for/HOLOTYPE *Agathidium iridescens* Miller and Wheeler, 2003 [red label with black line border]"

TYPE LOCALITY: Mexico, San Luis Potosi, 14 mi W Xilitla, 4800'.

DIAGNOSIS: This species is extremely similar externally to *A. aztec* and related species. It is dorsally iridescent in all specimens examined. The median lobe is diagnostic and has the operculum long and narrow with the apex slightly emarginate, with each ramus apically rounded (fig. 299). Other differences are mainly slight shape differences in the apical portion of the median lobe (fig. 300).

DESCRIPTION: Body relatively large (TBL = 2.79–3.94 mm), broad, robust (PNW/TBL = 0.46–0.50), strongly contractile.

Head and pronotum dark red-brown; elytra dark red -brown, conspicuously iridescent, especially laterally; venter red-brown; antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.53–0.58), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, not compressed; gula slightly convex; antennomere ratios: length I:II:III = 1.6:1.0:2.0, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.79–0.80), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.86–1.04); punctation similar to pronotum; sutural stria present in apical one-fifth of elytron. Flight wings present, fully developed. Mesosternum broad, flattened; medial carina reduced anteriorly. Metasternum moderately broad (MTL/MTW = 0.16), flattened, not or only gently sloping dorsad anteriorly; oblique femoral carinae not prominent, obsolete medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately expanded laterally, with moderately large field of ventral spatulate setae; mandibles not modified; metafemur moderately broad with small subapical tooth along ventral margin (fig. 155); metasternal

fovea transversely linear, with linear series of fine setae. Median lobe in lateral aspect slender, strongly curved basally, abruptly expanded along dorsal margin submedially, apical portion directed at angle dorsad, slender slightly expanded subapically, apex slightly curved ventrad, subapical (fig. 301); in ventral aspect slender, laterally expanded submedially, apical portion strongly and evenly narrowed, very slender, apex slightly expanded, apically rounded (figs. 299, 300); operculum in lateral aspect long, slender, straight, apex somewhat expanded (fig. 301), in ventral aspect long, nearly extending to apex of median lobe, lateral margins convergent to near apex, apex slightly expanded laterally, emarginate medially, each ramus slightly flared laterally (fig. 299); lateral lobes long, slender, strongly curved basally, sinuate apically, expanded medially and apex spatulate with 2 prominent setae (fig. 302).

Female not examined.

ETYMOLOGY: This species is named from the Latin word *iridis*, meaning "rainbow" or "iridescent", for the conspicuous iridescent coloration of the elytron in this species.

DISTRIBUTION: This species is moderately widespread in central and southern Mexico (fig. 367).

PARATYPES: MEXICO: *Durango*: 35 mi W El Salto, 23 Jul 1964, HF Howden (3, CNCI). *Hidalgo*: 4 mi SW Chapalhuacan, 3 Jul 1973, 3500', on "fungus logs", A Newton (1, FMNH); Tlanchinol, 43 km SW Huejutla, 14 Jun 1983, 1500', cloud forest litter, S and J Peck (1, PECK). *Oaxaca*: 52 mi N Oaxaca, 17 May 1971, 9500', leaf litter, S Peck (1, PECK); 33 km S Valle Nacional, 10 Sep 1986, 1600 m, litter, cloud forest, R Baranowski (1, LUND). *Puebla*: 5 mi NE Teziutlan, 16 Jul 1973, 5000', cloud forest leaf litter, Berlese, A Newton (1, FMNH). *Queretaro*: 18 mi E Landa Matamoros, 11 Jun 1971, 5500', leaf litter, S Peck (2, PECK); 17–18 mi E Landa de Matamoros, 30 Jun 1973, oak leaf and log litter, A Newton (1, FMNH); 17–18 mi E Landa de Matamoros, 28 Jun 1973, 5300', under bark, A Newton (10, CNCI). *San Luis Potosi*: 14 mi W Xilitla, 29 Jun 1973, 4800', leaf and log litter nonconiferous *Liquidambar* forest, A Newton (2, FMNH); 40 km W Xilitla, 6 Aug 1983, 1700 m, pine-oak forest litter, S and J Peck (6, PECK).

DISCUSSION: Specimens have been collected from litter in a variety of forest types including oak, pine, and *Liquidambar* cloud

forest and leaf and log litter. Elevation records are from 1500 to 9500 ft.

Agathidium dentigerum Subgroup

DISCUSSION: This group of species is characterized by the operculum of the median lobe completely divided into two long, independent rami (e.g., fig. 309), extensive endophallic armature consisting of an elongate medial, triramous process with a medial, apically truncate lobe and lateral, flattened hyaline lobes, the base of the lateral lobes distinctly sinuate in ventral aspect (e.g., fig. 309), relatively narrow metasternum medially with moderately large male metasternal fovea, somewhat reduced eyes that are dorsoventrally compressed and ovoid with large facets, and a large, acutely pointed, occasionally somewhat falcate male metafemoral tooth. The group may be further divided into two groups based on the presence or absence of a prominent lobelike tubercle medially on the gula. Other than this, the species are very similar externally with the only other significant differences being the relative development of the medial mesosternal and oblique metasternal carinae and the development of the lobelike process posteromedially on the metasternum. Male genitalia are generally diagnostic and male specimens should be dissected for most positive identification of specimens. The species are eastern Nearctic in distribution. They have been most commonly collected by sifting various litter types and Berlese extraction. The reduced eyes, strong contractility, and winglessness of many specimens suggest they are cryptic in habitats living in litter and in the substrate.

The only previously described species in this group is *A. dentigerum* Horn. Since the species in this subgroup are externally very similar, it is not surprising that Horn (1880) apparently included specimens in *A. dentigerum* that belong in what we describe here as new species. As additional collecting in the eastern United States ensues, we expect more species of this subgroup to come to light since the species appear to be numerous, cryptic in habitat, and relatively poorly collected.

Agathidium dentigerum Horn Figures 156, 303–305, 371

Agathidium dentigerum Horn, 1880: 303; Leng, 1920; Fall, 1934b.

TYPE MATERIAL: Lectotype (designated to fix this name with this species), ♂ in MCZC labeled "Stone Cr. LeeCo Va/269. [handwritten]/Type 3187 [number handwritten, two-thirds of label red]/*A. dentigerum* Horn [handwritten]". There is a single ♀ paratype (not examined) with same label data as the holotype (Horn, 1880).

TYPE LOCALITY: United States, Virginia, Lee Co., Stone Creek.

DIAGNOSIS: This species is similar to other *A. dentigerum* group members that have a large, acute, somewhat falcate male metafemoral tooth (fig. 156), very narrow metasternum with the oblique metasternal carinae relatively prominent and meeting medially in a large, posteriorly directed triangular lobe, large male metasternal fovea, and somewhat reduced eyes. However, this species has a very prominent lobelike tubercle medially on the gula, making it most similar to *A. akrogeneios* and *A. stephani*. From these species it may be distinguished by the shape of the median lobe which has the apical portion strongly recurved dorsally in lateral aspect (fig. 304), much more broadly so than in *A. akrogeneios* (fig. 310).

DESCRIPTION: Body small (TBL = 2.17–2.23 mm), rounded, robust (PNW/TBL = 0.47–0.48), strongly contractile.

Head, pronotum, and elytra red; venter yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.52–0.59), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very finely microreticulate; frontoclypeal suture obsolete medially; eyes not strongly reduced, protruding, large-faceted; gula broad, flattened, with prominent median lobelike, tubercle; antennomere ratios: length I:II:III = 1.3:1.0:0.9, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.71–0.74), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures

smooth, shiny. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.94–1.07); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina prominent. Metasternum narrow (MTL/MTW = 0.14–0.15), medially flat, distinctly sloping dorsad anteriorly; oblique femoral carinae not prominent laterally, medially meeting in very prominent, posteriorly directed triangular flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur slender, with large acute, subfalcate tooth subapically on posterior margin (fig. 156); metasternal fovea posterior, large, round with large brush of long, fine setae. Median lobe in lateral aspect moderately broad, basally bent, straight thereafter, apical portion tapered, strongly sinuate, apex finely pointed (fig. 304); in ventral aspect moderately broad, lateral margins slightly curved, apical portion narrowed to broadly pointed apex (fig. 303); operculum divided into two long, slender rami, apices slightly divergent and each narrowly rounded (fig. 303); lateral lobes broad, curved basally, apices rounded with 2 long subapical setae (fig. 305).

Female not examined.

DISTRIBUTION: *Agathidium dentigerum* is found in Tennessee and Virginia (fig. 371).

SPECIMENS EXAMINED: UNITED STATES: *Tennessee*: Campbell Co.: Morely, 17 Mar 1976, rotten wood debris, Berlese, QD Wheeler (2, QDWC).

DISCUSSION: A single habitat record is from "rotten wood debris".

Agathidium stephani Miller and Wheeler,
new species

Figures 157, 306–308, 369

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "ALA:Walker Co. Jasper, 12.X.80 T. King, litter [handwritten]/HOLOTYPE *Agathidium stephani* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, Alabama, Walker Co., Jasper.

DIAGNOSIS: This species is similar to other

A. dentigerum group members that have a large, acute, male metafemoral tooth (fig. 157), very narrow metasternum with the oblique metasternal carinae relatively prominent and meeting medially in a large, posteriorly directed triangular lobe, large male metasternal fovea and somewhat reduced eyes. However, this species has a very prominent lobelike tubercle medially on the gula, making it most similar to *A. akrogeneios* and *A. dentigerum*. From these species it may be distinguished by the shape of the median lobe, which is nearly straight in lateral aspect from near the base to the sharply pointed apex (fig. 307).

DESCRIPTION: Body small (TBL = 1.90–2.22 mm), rounded, robust (PNW/TBL = 0.43–0.48), strongly contractile.

Head, pronotum and elytra yellow to yellow-red; venter yellow to yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.62–0.63), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very finely microreticulate; frontoclypeal suture obsolete medially; eyes moderately reduced, protruding, large-faceted, dorsoventrally somewhat compressed; gula broad, flattened, with small but prominent median lobelike tubercle; antennomere ratios: length I:II:III = 1.2:1.0:1.0, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.77–0.82), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth, shiny. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.87–1.09); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina very prominent, anteriorly obscured on some specimens. Metasternum very narrow medially (MTL/MTW = 0.08–0.11), medially slightly concave, distinctly sloping dorsad anteriorly; oblique femoral carinae not prominent laterally, medially meeting in very prominent, posteriorly directed triangular flange.

Male tarsi 5-5-4; pro- and mesobasotar-

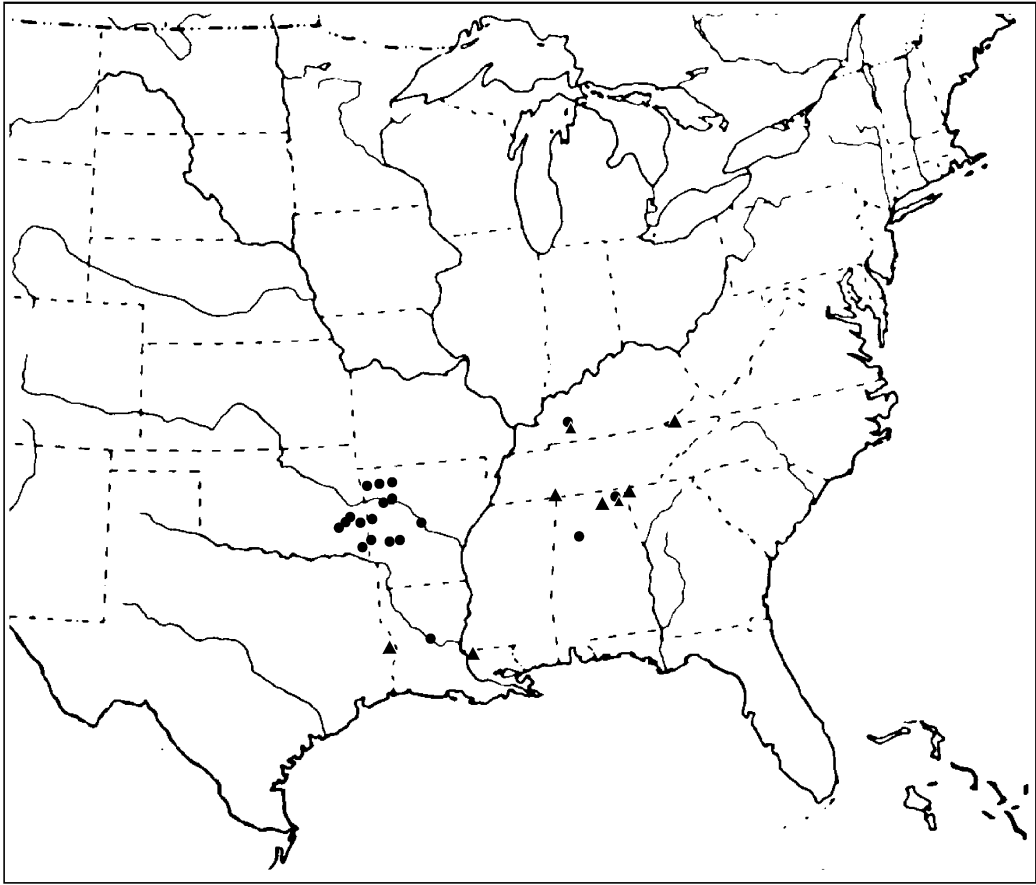


Fig. 369. Geographic distribution of *Agathidium oniscoides*-group species: *A. akrogeneios* = ▲; *A. stephani* = ●.

someres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur slender, with large acute tooth subapically on posterior margin (fig. 157); metasternal fovea posterior, prominent, round with large brush of long, fine setae. Median lobe in lateral aspect slender, basally bent, straight thereafter, apical portion tapered, straight to slightly dorsally bent, pointed apex (fig. 307); in ventral aspect moderately broad, lateral margins broadly curved, apex rounded (fig. 306); operculum divided into two long, slender rami, apices slightly divergent and each narrowly rounded (fig. 306); lateral lobes moderately broad, evenly curved in lateral aspect, apex pointed or narrowly rounded with 2 long subapical setae (fig. 308).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named in honor of K. Stephan, the collector of some of the type specimens.

DISTRIBUTION: This species is found in south-central North America from Oklahoma to Kentucky and south to Louisiana and Alabama (fig. 369).

PARATYPES: UNITED STATES: *Alabama:* Jackson Co.: McAllister Sink Cave, 10 Aug 1980, cave litter, T King (1, CNCI); 6 mi N Princeton outside Horseshoe Cave, 30 Jun 1967, Berlese, S Peck, A Fiske (1, CNCI); Walker Co.: Jasper, 12 Oct 1980, litter, T King (1, CNCI); Jasper, 12 Oct 1980, litter, T King (2, PECK). *Arkansas:* Garland Co.: 3 mi W Crystal Springs, 1 Jun 1984, 800', hardwood litter, J Pakaluk (1, AMNH); Logan Co.: Cove Lake RA, 16 Jun 1990, Berlese, CE Carlton (3, LSAM); 1 km E Lookout, Mt Magazine, 23 May 1986, JM Campbell (11, CNCI); Mt

Magazine Lookout, 26 May 1986, deciduous litter, JM Campbell (9, CNCI); Brown Springs, Mt Magazine, 23 May 1986, leaf litter along stream, JM Campbell (4, CNCI); Mt Magazine, Cameron Bluffs, 27 May 1986, leaf litter, JM Campbell (3, CNCI); Madison Co.: Withrow Spr. St Park, 27 Oct 1974, 1400', mixed hardwood forest ground litter, Berlese, AF Newton (5, CNCI); Montgomery Co.: 1.5 mi E Crystal Rec. Area, slopes along FS 177K, 6 Jul 1991, deciduous forest, Berlese, CE Carlton (5, LSAM); 2 mi NW Mount Ida, 1 Jun 1984, 800', hardwood litter, J Pakaluk (4, AMNH); 1 mi SE Joplin, 1 Jun 1984, 700', litter, J Pakaluk (1, AMNH); E Crystal Rec. Area at FS 177K, 24 Mar 1992, deciduous forest, Berlese, CE Carlton (1, LSAM); 1 mi SE Joplin, 1 Jun 1984, 700', litter near stream, J Pakaluk (2, QDWC); Newton Co.: Ozark NF, FSR 92096B, 6 km NE Pelsor, 13 May 1986, oak hickory leaf litter, JM Campbell (2, CNCI); Ozark NF, Alum Cove Natl Br. 4 km NW jct Hwy 7 and 16, 13 May 1986, JM Campbell (1, CNCI); Ozark NF, Buck Br. FSR 1209, 3 mi N Hwy 123, 14 May 1986, flood debris on bank, JM Campbell (1, CNCI); Polk Co.: Rich Mt Pioneer Cemetary, 17 Feb 1988, Berlese, RT Allen (1, LSAM); Shady Lake Rec. Area, 13 Oct 1974, 1200', mixed hardwood-pine forest ground litter, Berlese, AF Newton (2, CNCI); Rich Mt Eagleton Overlook, 17 Feb 1988, Berlese, RT Allen (1, LSAM); Pope Co.: Ozark NF jct Hwy 7 and FSR 1828, 12 May 1986, JM Campbell (1, CNCI); Pulaski Co.: Pinnacle Mt St Park NE Face near top, 11 Nov 1987, decid., Berlese, CE Carlton (9, LSAM); Scott Co.: 14 mi SE Waldron, 31 May 1984, forest litter, J Pakaluk (2, AMNH); Washington Co.: 3 mi S Devils Den St Park, 28 May 1979, oak hickory, S and J Peck (1, CNCI); Devils Den St Park, 8 Jun 1969, litter, Berlese, S and J Peck (8, QDWC). *Kentucky*: Edmonson Co.: Mammoth Cave Natl Park., Cabin Woods, 11 Apr 1979, W Suter (5, CNCI); Mammoth Cave Natl Park, Doyle Valley, 30 Aug 1967, log litter, Berlese, S Peck, A Fiske (1, CNCI). *Louisiana*: Rapides Par. Magnolia Rec. Area, 15 mi SW Alexandria, 4 Oct 1973, pine/hardwood leaf litter forest floor, A Newton (1, CNCI). *Oklahoma*: Clayton, 21 Jun 1983, leaves and pine needles, BF and JL Carr (3, CARR); Lafflore Co.: 10 mi SW Heavener winding stair watch tower, 10 Jun 1969, 1600', log litter, S Peck (1, CNCI); Latimer Co.: 5 mi W Red Oak, Dec 1980, K Stephan (1, KSIC); Apr 1983, K Stephan (20, QDWC); Robbers Cave St Park, Lost Lake, 3 Jul 1987, rotten pine, DS Chandler (1, CNCI); Nov 1983, K Stephan (4, KSIC); 25 Feb 1985, litter, grass, FIT, K Stephan (48, KSIC); McCurtain Co.: Beaver Bend St Park, 27 Jul 1968, dry rivulet, W Suter (1, PECK).

DISCUSSION: *Agathidium stephani* has been collected in a wide variety of habitats, including leaves and pine needles, oak, hickory, pine, grass and various other litter types, cave litter, and debris on a river bank. Elevation records are from 800 to 1200 ft.

Agathidium akrogeneos Miller and
Wheeler, new species
Figures 158, 309, 310, 369

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "GA: Dade Co., Cloud land Canyon St. Prk. 16.v.1972, S.&J. Peck Rhodo. Litter, B236/HOLOTYPE *Agathidium akrogeneos* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, Georgia, Dade Co., Cloudland Canyon State Park.

DIAGNOSIS: This species is similar to other *A. dentigerum* subgroup members that have a large, acute, somewhat falcate male metafemoral tooth (fig. 158), very narrow metasternum with the oblique metasternal carinae relatively prominent and meeting medially in a large, posteriorly directed triangular lobe, large male metasternal fovea, and somewhat reduced eyes. However, this species has a very prominent lobelike tubercle medially on the gula, making it most similar to *A. stephani* and *A. dentigerum*. From these species it may be distinguished by the shape of the median lobe, which is straight in lateral aspect from near the base to near the apex where it is abruptly recurved dorsally (fig. 310).

DESCRIPTION: Body small (TBL = 2.36–2.45 mm), rounded, robust (PNW/TBL = 0.45–0.51), strongly contractile.

Head, pronotum, and elytra red; venter red to yellow-brown; antennae, palpi, and legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.54–0.62), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes moderately prominent and protruding, but dorsoventrally compressed, large-faceted; gula broad, flattened, with prominent median lobelike tubercle; antennomere ratios: length I:II:III = 1.6:1.0:1.0, width VII:VIII:IX = 1.0:1.0:2.3. Pron-

otum very large, broad (PNL/PNW = 0.70–0.76), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth, shiny. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.86–1.15); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina prominent. Metasternum narrow (MTL/MTW = 0.10–0.15), slightly concave medially, distinctly sloping dorsad anteriorly; oblique femoral carinae not prominent laterally, medially meeting in very prominent, posteriorly directed triangular flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur slender, with very sharp, acuminate, large tooth subapically on posterior margin (fig. 158); metasternal fovea posterior, prominent, round with large brush of long, fine setae. Median lobe in lateral aspect slender, basally bent, straight thereafter, apical portion tapered, straight, apex abruptly and sharply recurved dorsally (fig. 310); in ventral aspect moderately broad, lateral margins broadly curved, apex abruptly narrowed and with medial, narrowly rounded prominence (fig. 309); operculum divided into two long, slender rami, apices slightly divergent and each narrowly rounded (fig. 309); lateral lobes moderately broad, evenly curved in lateral aspect, apex pointed or narrowly rounded with 2 long subapical setae (fig. 310).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named *akro-geneios* from the Greek word meaning “with a prominent chin”, for the prominent gular tubercle in this species.

DISTRIBUTION: This species is found in southeastern North America from Texas to Georgia and north to Virginia (fig. 369).

PARATYPES: UNITED STATES: *Alabama*: Jackson Co.: 5 mi NW Princeton, 19 May 1972, forest litter, S Peck (1, PECK); 5 mi N Garth, 19 May 1972, S Peck (8, PECK); Madison Co.: Monte Sano St. Park, 17 May 1972, S and J Peck (3, PECK). *Georgia*: Dade Co.: Cloudland Canyon St. Park., 16 May 1972, *Rhododendron* litter, S

and J Peck (2, PECK). *Kentucky*: Edmonson Co.: Mammoth Cave Natl Park, Doyle Valley, 30 Aug 1969, log litter, S Peck, A Fiske (1, PECK). *Louisiana*: W Feliciana Co.: Magnolia Glen TNC property near Tunica WMA, 16 Nov 1996, mixed mesophytic, Berlese, CE Carlton (24, LSAM); Tunica WMA Magnolia Glen TNC Property, 10 mi NW St Francisville, 25 Mar 1998, mesophytic forest, Berlese, CE Carlton (19, LSAM); Cabin area 30°47'N, 91°15'W, 1 Feb 2001, pitfall, AR Cline (3, LSAM). *Tennessee*: Hardin Co.: 0.5 mi W Olive Hille, 28 May 1991, old growth, Berlese, C Carlton (3, LSAM). *Texas*: Sabine Co.: 9 mi E Hemphill, 11 May 1988, beech, magnolia litter, Berlese, R Anderson (2, LSAM). *Virginia*: Lee Co.: Cumberland Gap Natl Park. nr Skyline Cave, 10 Jul 1971, dry litter at log, W Shear (1, AMNH).

DISCUSSION: This species has been collected from February to November. It has been found in a variety of habitats, including “mesophytic forest”, and various litter types, including logs, *Rhododendron*, beech, and magnolia.

Agathidium framea Miller and Wheeler,
new species
Figures 117, 311–313, 373

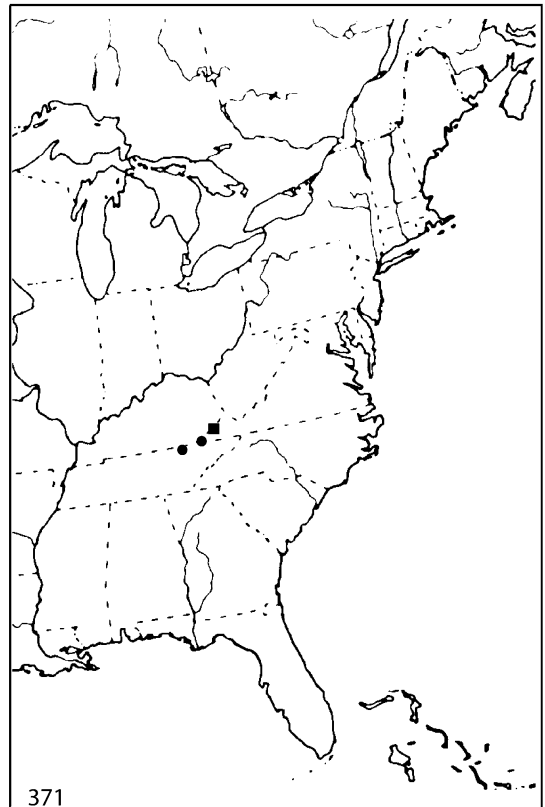
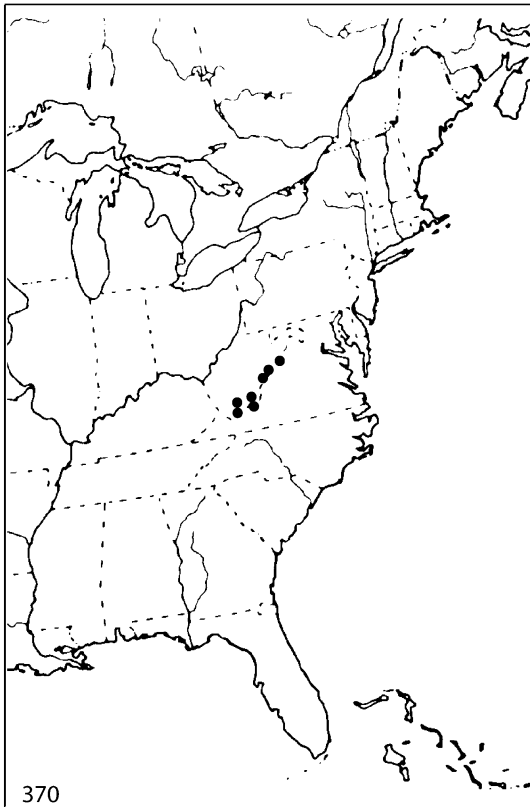
TYPE MATERIAL: Holotype, ♂ in CMNC labeled “N.CAR:Wilkes Co. Jeffress Park, 3500' BlueRidgePkwy, mi 272 17.VIII.1981 S. Peck log—leaf litter/HOLOTYPE *Agathidium framea* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: United States, North Carolina, Wilkes Co., Jeffress Park, Blue Ridge Parkway mi 272, 3500'.

DIAGNOSIS: This species is distinguishable from most species by the relatively reduced eyes (dorsoventrally compressed and large-faceted), relatively indistinct oblique metasternal carinae which meet medially in a very small, indistinct triangle, unmodified gula, the male with a distinct, broad lobe along posterior margin of coxa (fig. 117), and very distinctive male genitalia. The apical portion of the median lobe is long and apically expanded into an arrowhead shape in ventral aspect (fig. 311).

DESCRIPTION: Body small (TBL = 1.93–2.12 mm), rounded (PNW/TBL = 0.4), robust, strongly contractile.

Head, pronotum, and elytra red; venter



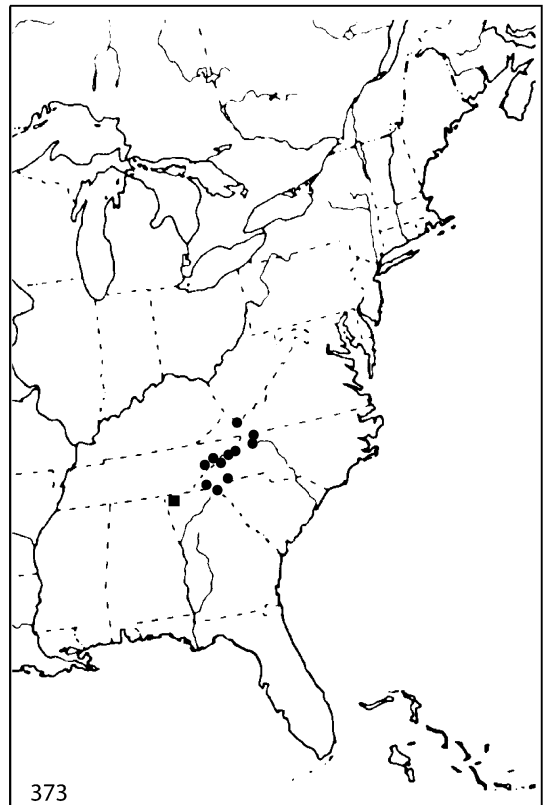
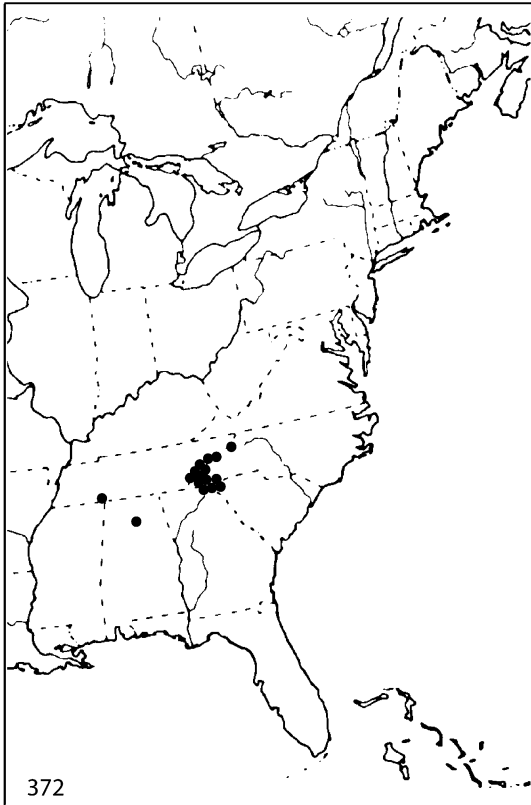
Figs. 370, 371. Geographic distribution of *Agathidium oniscoides*-group species: 370, *A. pocahontasae*. 371, *A. appalachium* = ■; *A. dentigerum* = ●.

yellow to yellow-brown; antennae, palpi, and legs yellow.

Head broad ($MDL/OHW = 0.52$), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very finely microreticulate; frontoclypeal suture obsolete medially; eyes strongly compressed, reduced to elongate triangle; gula broad, flattened, with prominent rim; antennomere ratios: length I:II:III = 1.8:1.0:1.3, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad ($PNL/PNW = 0.73-0.75$), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures slightly microreticulate. Elytra broad, lateral margins strongly rounded, apically rounded ($SEL/ELW =$

1.02–1.06); punctuation similar to pronotum; sutural stria indistinctly present only apically. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina present, well developed. Metasternum narrow ($MTL/MTW = 0.09-0.10$), medially concave, slightly sloping dorsad anteriorly; oblique femoral carinae present, low and indistinct, meeting medially in small, triangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately laterally expanded, with moderately large field of ventral spatulate setae; mandibles not modified; metafemur broad, with exceptionally large, flat, triangular tooth subapically on posterior margin (fig. 117); metasternal fovea large, transverse, broadly oval with large, conspicuous brush of fine, dense setae; posteromedial margin of metacoxa with broad, flat, rounded



Figs. 372, 373. Geographic distribution of *Agathidium oniscoides*-group species: 372, *A. gallititillo*. 373, *A. framea* = ●; *A. georgiaense* = ■.

lobe. Median lobe in lateral aspect slender, strongly curved basally, moderately straight thereafter, apical portion slender, tapered, apex sharply and abruptly bent dorsad, apex pointed and often slightly recurved (fig. 312); in ventral aspect slender, long, lateral margins subparallel to sinuate, apical portion tapered, apically expanded into broad, arrow-head shape, apex rounded to medially pointed (fig. 311); operculum divided into two long, slender, straight rami, rami sometimes slightly apically expanded, apices pointed; endophallic armature consisting of long, flat, broad medial lobe that is apically truncate and slightly emarginate medially and lateral hyaline lobes on each side of median lobe (fig. 311); lateral lobes long, slender, apically slightly expanded, basally, along with basal

piece, strongly sinuate in ventral aspect (fig. 313).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Latin word *framea*, meaning "spear", for the spear-shaped apex of the median lobe of the aedeagus in this species.

DISTRIBUTION: This species has been collected from Georgia, North Carolina, Tennessee, and Virginia (fig. 373).

PARATYPES: UNITED STATES: *Georgia*: Rabun Co.: Setolah, 29 May 1983, *Rhododendron* and mixed leaf litter, DS Chandler (1, DENH). *North Carolina*: Black Mts (3, AMNH); Valley of Black Mts, 29 Jul 1906, W Beutenmuller (4, AMNH); Alleghany Co.: Roaring Gap Stone Mt St Park Rd, 18 Aug 1981, 2000', leaf litter, S Peck (14, CNCI); Cumberland Knob, Blue Ridge Parkway, mi 218, 19 Aug 1981, 2700', forest leaf lit-

ter, S Peck (7, CNCI); Avery Co.: Grandfather Mt Blue Ridge Parkway, mi 304, 17 Aug 1981, 4000', leaf litter, S Peck (17, CNCI); Linville Falls, Blue Ridge Parkway, mi 317, 16 Aug 1981, 3500', *Rhododendron* litter, S Peck (1, CNCI); Linville Falls, Blue Ridge Parkway mi 337, 16 Aug 1981, 3500', *Rhododendron* litter, S Peck (6, PECK); Henderson Co.: 0.3 mi SW Bat Cave, 22 Jul 1967, 1000', litter, S Peck, A Fiske (5, PECK); Macon Co.: Highlands, QD Wheeler (1, QDWC); Mitchell Co.: Roan Mtn, 25 Jul 1967, 5000', log litter, S Peck, A Fiske (2, PECK); Wilkes Co.: Jeffres Park, Blue Ridge Parkway mi 272, 17 Aug 1981, 3500', leaf litter, S Peck (8, CNCI); Jeffress Park, Blue Ridge Parkway mi 272, 17 Aug 1981, 2500', leaf litter, S Peck (3, PECK); Yancy Co.: Black Mts, Blue Ridge Parkway mi 152, 15 Aug 1981, 4900', leaf litter, S Peck (4, CNCI). *Tennessee*: Cocke Co.: Great Smoky Mts NP, Albright Grove Tr 83°16'45"W, 35°44'10"N, 19 Oct 2001, 1000 m, decid stump, Berlese, CE Carlton (21, LSAM); 6 mi SE Cosby, 31 May 1983, forest litter, DS Chandler (7, DENH); Sevier Co.: Great Smoky Mts NP, Porters Creek Trail 82°23'52"W, 35°40'13"N, 18 Oct 2001, 870 m, old growth, Berlese, T Tischechkin, A Cline (4, LSAM). *Virginia*: Tazewell Co.: E River Mtn Summit 1 mi E Rd 662, 2 May 1971, 3300', *Rhododendrum*, oak gum, hemlock litter, W Shear (1, AMNH).

DISCUSSION: This species has been collected from a variety of litter types, including oak, gum, hemlock, *Rhododendron*, and logs. Elevation records are from 1000 to 5000 ft.

Agathidium appalachium Miller and Wheeler, new species
Figures 159, 314–316, 371

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "VA: Wise Co 1.5 mi S. Norton [handwritten]/rot. stump S. Peck, ber 133 1500' [handwritten]/HOLOTYPE *Agathidium appalachium* Miller and Wheeler, 2003 [red label with black line border]". Only a single specimen is known of this species.

TYPE LOCALITY: United States, Virginia, Wise Co., 1.5 mi S Norton.

DIAGNOSIS: This species can be distinguished from most species by its very small size, reduced eyes, lack of a medial lobe on the anterior margin of the gula, relatively large metafemoral tooth (fig. 159), and distinctive median lobe which has the apex truncate in ventral aspect and the operculum relatively short (fig. 314).

DESCRIPTION: Body minute (TBL = 1.89

mm), oblong (PNW/TBL = 0.51), strongly contractile.

Head and pronotum light red; elytra red, not iridescent; venter yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.55), dorsal surface flattened, dorsoventrally compressed; with extremely fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes reduced, dorsoventrally compressed, and elongate, large faceted; gula slightly concave, unmodified; antennomere ratios: length I:II:III = 1.2:1.0:0.9, width VII:VIII:IX = 1.1:1.0:2.1. Pronotum very large (PNL/PNW = 0.71), broad, strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with minute, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral margins strongly rounded, slightly elongate, but not apically acuminate (SEL/ELW = 0.97); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, rounded; medial carina well developed. Metasternum very narrow medially (MTL/MTW = 0.16), flattened, medially strongly dorsally sloped anteriorly; oblique femoral carinae present and distinct, meeting medially in rounded flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with strongly produced, flattened, thornlike subapical tooth on posterior margin (fig. 159); metasternal fovea prominent, transversely ovoid, with pencil of long, fine, dense setae. Median lobe in lateral aspect slender, slightly curved basally, straight thereafter, apical portion slender, apically distinctly curved dorsad (fig. 315); in ventral aspect slender, slightly widened medially, apical portion long, slender, tapered to abruptly truncate apex (fig. 314); operculum moderately small, broadly V-shaped, each ramus very slender, apically narrowly rounded (fig. 314); lateral lobes moderately robust, in lateral aspect broad, apically tapered to narrowly rounded apex, without long subapical setae (fig. 316).

Female not examined.

ETYMOLOGY: Named after the Appalachian

Mountains, where the type specimen was collected.

DISTRIBUTION: This species is known only from the type locality in Virginia (fig. 371).

DISCUSSION: The single specimen of this species was collected from a Berlese sample of a "rotten stump".

Agathidium pocahontasae Miller and
Wheeler, new species
Figures 160, 317–319, 370

TYPE MATERIAL: Holotype, ♂ in CNCI labeled "VA. Mountain Lake Biol. Sta., 2 mi. N Mountain Lake, 4000' IX, 11–12, 1967 J.M. & B.A. Campbell/Berlese sample of pine duff/HOLOTYPE *Agathidium pocahontasae* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, Virginia, Mountain Lake Biological Station, 2 mi N Mountain Lake, 4000'.

DIAGNOSIS: This species can be distinguished from most species by its very small size, extremely narrow metasternum medially, reduced eyes, distinctive medial lobe on the anterior margin of the gula, relatively large metafemoral tooth (fig. 160), and distinctive median lobe which has the operculum very short and V-shaped (fig. 317).

DESCRIPTION: Body very small (TBL = 1.76–2.11 mm), oblong (PNW/TBL = 0.47–0.55), strongly contractile.

Head and pronotum red; elytra red, not iridescent; venter yellow-red; antennae, palpi, and legs yellow to red-yellow.

Head broad (MDL/OHW = 0.54–0.70), dorsal surface flattened, dorsoventrally compressed; with extremely fine punctures, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes reduced, dorsoventrally compressed and elongate, large faceted; gula with small but prominent lobe medially on the anterior margin; antennae relatively short; antennomere ratios: length I:II:III = 1.8:1.0:0.9, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad (PNL/PNW = 0.58–0.72), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with minute, sparse punctures, each with a short, very fine seta, surface between punctures smooth. Elytra broad, lateral mar-

gins strongly rounded, slightly elongate, but not apically acuminate (SEL/ELW = 0.84–1.04); punctation similar to pronotum; sutural stria indistinctly present only apically. Flight wings strongly reduced. Mesosternum broad, rounded; medial carina obscured anteriorly. Metasternum very narrow (MTL/MTW = 0.10–0.14), flattened, medially strongly dorsally sloped anteriorly; oblique femoral carinae present and sharp, but not prominent, medially low.

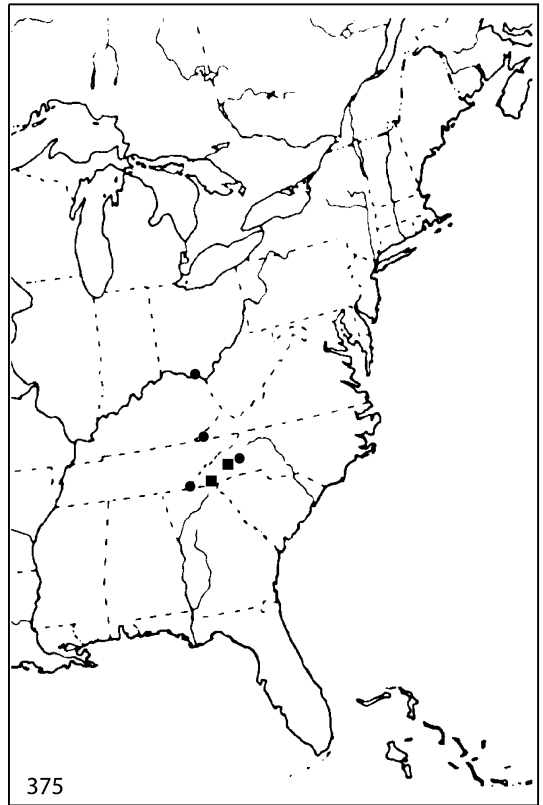
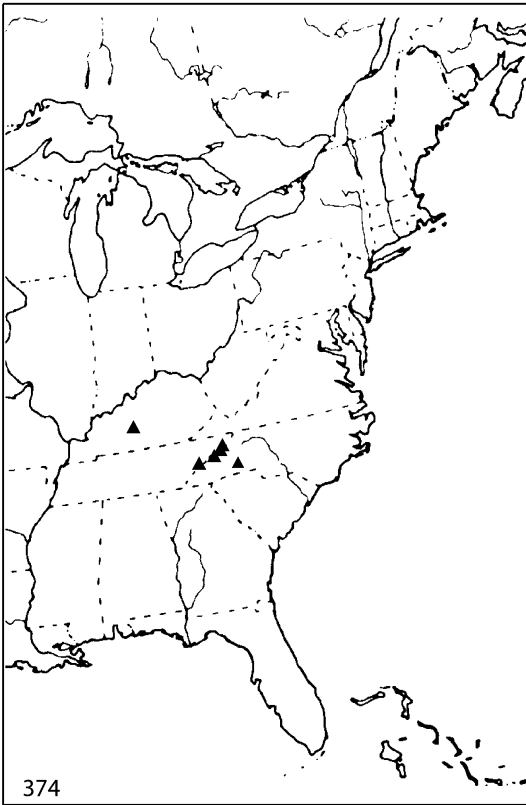
Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small field of ventral spatulate setae; mandibles not modified; metafemur relatively slender, with strongly produced, flattened, thornlike subapical tooth on posterior margin (fig. 160); metasternal fovea prominent, transversely ovoid, with pencil of long, fine, dense setae. Median lobe in lateral aspect slender, slightly curved basally, straight thereafter, ventral margins sinuate subapically, apically evenly tapered to acutely pointed, slightly ventrally curved apex (fig. 318); in ventral aspect moderately slender, slightly widened medially, evenly tapered to rounded apex (fig. 317); operculum small, inconspicuous, broadly V-shaped, each ramus slender, apically narrowly rounded (fig. 317); lateral lobes robust, in lateral aspect broad, apically tapered to narrowly rounded apex, in ventral aspect apically somewhat expanded, each with 2 long, stout subapical setae (fig. 319).

Female not examined.

ETYMOLOGY: This species is named *pocahontasae* after a county in Virginia from which numerous type specimens were collected and after the young woman Pocahontas, who may have saved the struggling Jamestown Colony by marrying John Rolfe, thereby establishing a peace between Jamestown colonists and the tribes of Powhatan.

DISTRIBUTION: This species has been collected from Virginia and West Virginia (fig. 370).

PARATYPES: UNITED STATES: *West Virginia:* Greenbrier Co.: 21 km NE Richmond, 13 May 1986, A Smetana (1, CNCI); Mercer Co.: Camp Creel St. Forest Marsh Fork Falls, 18 Oct 1970, hardwood litter, S Bird (5, QDWC); Camp Creek St. Forest, 23 Jul 1971, 3000', forest litter, S Peck (3, PECK); Camp Creek St. Forest, 23 Jul 1971, leaf litter, S Peck (4, CNCI); Pendleton Co.: 5 mi



Figs. 374, 375. Geographic distribution of *Agathidium oniscoides*-group species: 374, *A. divaricatum*. 375, *A. carolinense* = ■; *A. bushi* = ●.

S Witmer, 18 Jul 1971, 3000', forest litter, Berlese, S Peck (1, CNCI); Pocahontas Co.: 2 km W Strawberry Glades, 14 May 1986, A Smetana (5, CNCI); Snodogar's Cave nr Droople?, 10 Jun 1989, forest litter, JF Cornell (2, CUIC); Raleigh Co.: Grandview St Park, 8 Jun 1971, forest litter, oak maple buckeye, W Shear (1, QDWC).

DISCUSSION: The species has been collected from various litter types, including oak, buckeye, maple, and pine. Elevation records are from 3000 to 4000 ft.

Agathidium carolinense Miller and Wheeler, new species
Figures 161, 320–322, 375

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "N.C.: Macon Co., 8 mi W Franklin 19-III-1976/sift rhododendron litter along stream LEWatrous/HOLOTYPIC *Agathidium carolinense* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, North Carolina, Buncombe Co., Blue Ridge Parkway, 5 mi W Craggy Gardens.

DIAGNOSIS: This species is similar to other members of the *A. dentigerum* group with unmodified gulae, especially *A. georgiaense* and *A. gallitillo*, but differs in the shape of the median lobe. In lateral aspect the apical portion is long and moderately slender and is strongly curved dorsad apically (fig. 321). In ventral aspect the apical portion is slender and evenly tapered to a narrowly rounded apex (fig. 320).

DESCRIPTION: Body moderately large (TBL = 2.52 mm), rounded, robust (PNW/TBL = 0.46), strongly contractile.

Head, pronotum, and elytra red; venter red to yellow-red; antennae, palpi, and legs yellow-red.

Head broad (MDL/OHW = 0.55), dorsal surface flattened, dorsoventrally compressed;

with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation; frontoclypeal suture obsolete medially; eyes somewhat reduced, dorsoventrally compressed; gula concave; antennomere ratios: length I:II:III = 1.3:1.0:1.3, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.76), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.05); punctation similar to pronotum; sutural stria obscurely present only at extreme apex. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina well developed. Metasternum narrow (MTL/MTW = 0.14), medially slightly convex, distinctly sloped dorsad anteriorly; oblique femoral carinae obscured, rounded, but present, medially with broad subtriangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres moderately expanded laterally, with moderately large field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, subapical tooth on posterior margin broad, triangular, large, brush of long, fine setae sharply pointed (fig. 161); metasternal fovea large, transversely oval, with large brush of long fine setae. Median lobe in lateral aspect long, slender, bent basally, relatively straight thereafter, apical portion long, slender, apex strongly curved dorsally, sharply pointed (fig. 321); in ventral aspect slender, slightly expanded medially, apex long, slender, parallel-sided to slender, narrowly pointed apex (fig. 320); operculum divided, rami relatively short, each ramus slender and apically narrowly rounded (fig. 320); endophallic armature comprised of very long, flat, truncate, parallel-sided lobe with a lateral, hyaline lobe on each side; lateral lobes long, bent basally, slender basally, expanded and flattened apically, apex narrowly rounded with two long, stout setae (fig. 322).

Female not examined.

ETYMOLOGY: Named after the state in which this species was collected.

DISTRIBUTION: This species is known only from North Carolina (fig. 375).

PARATYPE: UNITED STATES: *North Carolina*: Buncombe Co.: Blue Ridge Parkway 5 mi W Craggy Gardens, 22 Jul 1967, 3500', chestnut stump, Berlese, S Peck, A Fiske (1, PECK).

DISCUSSION: This species has been collected from a chestnut stump and *Rhododendron* litter along a stream. A single elevation record is from 3500 ft.

Agathidium gallititillo Miller and Wheeler,
new species

Figures 162, 323–325, 372

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "NC: Macon Co., Highlands 8 VI Q.D. Wheeler Lot #81 105/HOLOTYPE *Agathidium gallititillo* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, North Carolina, Macon Co., Highlands.

DIAGNOSIS: This species is very similar to several other members of the *A. dentigerum* subgroup that lack modified gulae but can be distinguished by the shape of the median lobe (figs. 323–324). In lateral aspect the apical portion is elongate and slightly deflected ventrad at its base to near its middle, where it is deflected back dorsad (fig. 324). The lateral lobes curve correspondingly at the base of the apical portion of the median lobe (fig. 325). The rami of the operculum are slender and end far short of the apex of the median lobe (fig. 323). The metasternum is narrow and the oblique metasternal carinae are moderately distinct and meet medially in a prominent, acutely pointed, triangular process. The male metasternal fovea is relatively large. The pro- and mesobasotarsomeres are relatively broadly expanded in males of this species. This species and *A. framea* often co-occur in areas of North and South Carolina and can be difficult to separate without dissection. However, *A. framea* has more strongly reduced eyes that are narrowed posteriorly, whereas *A. gallititillo* has somewhat larger eyes that are oval and have larger, more prominent facets than in *A. framea*. Also, *A. gallititillo* lacks the broad, posterior lobe on the male mesocoxa that is present in *A. framea* (fig. 117).

DESCRIPTION: Body moderately small

(TBL = 2.78–3.12 mm), rounded, robust (PNW/TBL = 0.45–0.48), strongly contractile.

Head and pronotum red to dark red; elytra dark red; venter, antennae, palpi, and legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.67–0.69), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation; frontoclypeal suture obsolete medially; eyes prominent, protruding, slightly dorsoventrally compressed, large-faceted; gula concave, unmodified; antennomere ratios: length I:II:III = 1.1:1.0:1.0, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.71–0.77), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.95–0.97); punctuation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina well developed. Metasternum narrow (MTL/MTW = 0.15–0.16), medial area slightly convex, slightly sloped dorsad anteriorly; oblique femoral carinae obscured, low, rounded, medially with broad, flat, subtriangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, with large ventral field of spatulate setae; mandibles not modified; metafemur slender, subapical posterior tooth moderately large, triangular, acutely pointed (fig. 162); metasternal fovea large, transversely oval, with large brush of long fine setae. Median lobe in lateral aspect long, slender, curved basally, moderately straight thereafter, apical portion long, slender, tapered, first distinctly curved ventrally, then abruptly curved dorsally, with small subapical prominence on dorsal margin (fig. 324); in ventral aspect slender, somewhat expanded medially, apical portion evenly tapered to broadly rounded apex, apically slightly expanded (fig. 323); operculum divided, rami long but ending well short of apex of median lobe, slender, sinuate, with

apices narrowly rounded and divergent (fig. 323); endophallic armature comprised of long, flat, truncate lobe with a lateral, hyaline lobe on each side; lateral lobes slender, long, bent basally, slightly but distinctly curved near base of apical portion of median lobe (fig. 325).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named *gallitillo* from the Latin word *gallicus*, meaning “Gaulish” or “pertaining to the Gauls or French”, and the Latin verb *titillo*, meaning “to tickle”, in reference to the long, sinuate parts of the ventral piece of the male genitalia.

DISTRIBUTION: This species is found in southeastern North America from Alabama to Georgia north to North Carolina and Tennessee (fig. 372).

PARATYPES: UNITED STATES: *Alabama*: Cullman Co.: Cullman, 5 Jun 1960, leaf litter, WR Suter (1, CNCI). *Georgia*: Rabun Co.: Black Rock Mtn St. Park, 2.5 mi NW Clayton, 29 Jun 1983, 3600', forest floor litter, J Pakaluk (2, AMNH); Rabun Bald, 2 Aug 1981, 4000', leaf litter, J Pakaluk, Q Wheeler (2, QDWC); Black Rock Mtn St Park, 5 Jun 1981, leaf litter, Berlese, QD Wheeler (2, QDWC); 10 mi NE Clayton, 12 Jun 1981, 2400', forest floor litter, J Pakaluk (3, AMNH); 1.7 mi NW Pine Mtn, 3 Jul 1983, forest floor litter, J Pakaluk (3, AMNH); Mountain City, Black Rock Mtn St. Park, 15 Jun 1973, *Rhododendron* litter, WR Suter (1, AMNH); Chatahoochee NF 10 mi NE Clayton, 12 Jun 1981, leaf litter, J Pakaluk (2, AMNH); Towns Co.: Brass-town Bald, 29 Jun 1974, JR Ables (2, JRAC). *North Carolina*: Blue Ridge Parkway, 4 Jun 1984, *Rhododendron* litter, QD Wheeler (1, QDWC); Highlands, Jun 1988 (1, MCZC); Van Hook Glade, 4 mi W Highlands, 30 Aug 1967, 3500', JM and BA Campbell (1, CNCI); Black Mts, Jul (4, MCZC); Highlands, 21 Jun 1957, 3800', WJ Brown (1, CNCI); Vally of Black Mts, 10 Sep 1906, W Beutenmuller (3, AMNH); Avery Co.: Linville Falls, Blue Ridge Parkway, mi 317, 16 Aug 1981, 3500', *Rhododendron* litter, S Peck (10, CNCI); Haywood Co.: Richland Balsam Mtn, 27 May 1986, 1800–1950 m, A Smetana (5, CNCI); Jackson Co.: Blue Rdg. Parkway nr Grassy Ridge Mine, 27 May 1986, 1520 m, A Smetana (4, CNCI); Whiteside Mtn nr Highlands, 21 Jun 1986, 1370–1430 m, A Smetana (10, CNCI); Macon Co.: Highlands, QD Wheeler (4, QDWC); Highlands, nr California Gap, 12 Aug 1981, 3000–3500', leaf litter, QD Wheeler (5, QDWC); 1.5 mi NW Highlands, 2 Jul 1983, 3400', hemlock/pine litter, J Pakaluk (2, AMNH);

Highlands, 2 mi W Nantahala NF, 7 Aug 1981, leaf litter, J Pakaluk, Q Wheeler (6, QDWC); 1 mi NW Highlands, 16 Aug 1981, leaf litter, QD Wheeler (4, QDWC); 5 mi NW Highlands, 12 Aug 1981, 3000–3500', *Rhododendron*-hardwood litter, QD Wheeler (2, QDWC); Coweeta Hydrobiol. Sta., 28 May 1983, mixed leaf litter, DS Chandler (4, DENH); 5 mi NW Highlands nr California Gap, 9 Aug 1981, *Rhododendron* litter with slime -mold fruiting bodies, J Pakaluk, Q Wheeler (1, QDWC); nr Cliffside Lake Campground, NW Highlands, 16 May 1986, 1050 m, A Smetana (2, CNCI); Highlands, 8 Jun 1981, QD Wheeler (9, QDWC); 4 mi NW Highlands, 6 Jun 1984, *Rhododendron* litter, QD Wheeler (1, QDWC); Hook Glade, 9 Jun 1984, *Rhododendron* litter, QD Wheeler (1, QDWC); Highlands, 2 mi W Nantahala NF, 8 Jun 1981, 3200', leaf litter, QD Wheeler (9, QDWC); Highlands Biol. Sta., 10 Jun 1981, leaf litter, Berlese, QD Wheeler (9, QDWC); 1 mi NW Highlands, 11 Aug 1981, white pine leaf litter, J Pakaluk, Q Wheeler (5, QDWC); Wayah Bald, 8 Jun 1984, 3500', *Rhododendron* litter along stream, QD Wheeler (1, QDWC); Highlands, 8 Jun 1981, QD Wheeler (2, QDWC); Nantahala Natl For., 11 Aug 1981, litter, QD Wheeler (4, QDWC); Highlands, 8 Jun 1981 (22, QDWC); Highlands 5 mi NW California Gap, 12 Aug 1982, 3000–3500', leaf litter, J Pakaluk, Q Wheeler (3, QDWC); California Gap, 7 Jun 1984, *Rhododendron*/hardwood litter, QD Wheeler (1, QDWC); 5 mi NW Highlands, California Gap, 12 Aug 1982, 3000–3500', *Rhododendron*/hardwood litter, J Pakaluk, Q Wheeler (2, QDWC); 4 mi NW Highlands near Buckhorn Gap, 22 Aug 1982, white pine litter, J Pakaluk (3, AMNH); Swain Co.: P, Flat Creek Tr. 83°10'21"W, 35°33'1"N, 31 Jul 2001, 1500 m, Berlese, A Tsihechkin (2, LSAM); Transylvania Co.: Blue Ridge Parkway, mi 416, Looking Glass View, 14 Aug 1981, 4500', forest litter, S Peck (2, CNCI); Yancy Co.: Black Mts, Blue Ridge Parkway, mi 352, 15 Aug 1981, 4900', leaf litter, S Peck (6, CNCI). *South Carolina*: Oconee Co.: 17 Mar 1974, under pine bark, JR Ables (1, JRAC); 7 mi S NC state line on Hwy 107, 29 May 1983, forest litter, DS Chandler (6, DENH); Oconee St Park 6 mi NNW Walhalla, 1 Jul 1983, 1750', hardwood litter, J Pakaluk (7, AMNH); Oconee St. Park, 6 mi NNW Walhalla, 1 Jul 1983, 1750', hardwood litter, J Pakaluk (1, AMNH); 7 mi S NC state line on Hwy 107, 29 May 1983, forest litter, DS Chandler (1, CNCI). *Tennessee*: Blount Co.: 5.8 mi E Cling Dome, 1 Jun 1991, CE Carlton (1, LSAM); Cocke Co.: GSMNP, Albright Grove Tr. 83°16'45"W, 35°44'10"N, 19 Oct 2001, decid stump, Berlese, Carlton (8, LSAM); Hardin Co.: 0.5 mi W Olive Hill, 28 May 1991, old growth,

Berlese, CE Carlton (2, LSAM); Monroe Co.: Indian Boundry Campground, 29 May 1991, CE Carlton (3, LSAM); Sevier Co.: GSMNP, Porters Creek Trail 83°23'52"W, 35°40'13"N, 18 Oct 2001, 870 m, old growth, Berlese, A Tsihechkin (9, LSAM).

DISCUSSION: This species has been collected from May to October. Habitats from label data include various types of litter including *Rhododendron*, white pine, various hardwood leaf litter, and others. Elevation records are from 1750 to 4900 ft.

Agathidium divaricatum Miller and
Wheeler, new species
Figures 163, 326–328, 374

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "N.CAR: Avery Co. Linville Falls, 3500' BlueRidge Pkwy, mi 317 16.VIII.1981 S. Peck rhodo. litter at log/HOLOTYPE *Agathidium divaricatum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, North Carolina, Avery Co., Linville Falls, Blue Ridge Parkway mi 317, 3500'.

DIAGNOSIS: This species is very similar to other members of the *A. dentigerum* subgroup that lack a process on the gula. The metasternum is very narrow and the oblique metasternal carinae are indistinctly present and meet medially in a small, indistinct triangular process. The shape of the median lobe is diagnostic. In lateral aspect it is relatively robust with the apical portion short, relatively straight, and continuing apically in approximately the same line as the medial portion of the lobe (fig. 327). The rami of the operculum extend nearly to the apex of the median lobe (fig. 326).

DESCRIPTION: Body moderately small (TBL = 2.57–2.66 mm), rounded (PNW/TBL = 0.48–0.51), robust, strongly contractile.

Head and pronotum red to dark red; elytra dark red; venter, antennae, palpi, and legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.55–0.64), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, smooth; frontoclypeal suture obsolete medially; eyes prominent, protruding, slightly dorsoventrally compressed, large-

faceted; gula concave, somewhat swollen medially; antennomere ratios: length I:II:III = 1.4:1.0:1.0, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.71), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth, shiny. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.90–1.03); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina obscured, at least anteriorly. Metasternum narrow (MTL/MTW = 0.12), medial area slightly convex, slightly sloped dorsad anteriorly; oblique femoral carinae obscured, low, rounded, medially with broad, flat, subtriangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small ventral region of spatulate setae; mandibles not modified; metafemur moderately broad, with acuminate, sharp, large tooth on posterior margin (fig. 163); metasternal fovea posterior, moderately large, transverse, with dense brush of long fine setae. Median lobe in lateral aspect robust, broad, especially medially, bent basally, relatively straight thereafter, expanded medially, apical portion short, straight, apically slightly curved dorsally, apex sharply pointed (fig. 327); in ventral aspect robust, broad, lateral margins diverging to base of apical portion, apical portion abruptly narrowed basally, slender and with lateral margins parallel or slightly expanded medially, apex slender, narrowly rounded (fig. 326); operculum divided, rami long, nearly as long as apical portion of median lobe, broad, expanded apically and diverging laterally (fig. 326); endophallic armature comprised of long, flat, truncate lobe with a lateral, hyaline lobe on each side; lateral lobes long, slender, apically somewhat expanded in some specimens, apex narrowly rounded with 2 stout subapical setae (fig. 328).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Latin word *divaricatus*, meaning “diverging”, for the divergent rami of the operculum of the median lobe.

DISTRIBUTION: This species is found in

North Carolina, Tennessee, and Kentucky (fig. 374).

PARATYPES: UNITED STATES: *Kentucky*: Edmonson Co.: Mammoth Cave Natl Park, 24 Apr 1961, leaf litter, W Suter (1, FMNH). *North Carolina*: Black Mts (1, AMNH); Black Mts, Jun 1902 (1, CASC); Valley of Black Mts, 16 Sep 1906, W Beutenmuller (2, AMNH); Black Mts, Sep (8, AMNH); Valley of Black Mts, 28 Jul 1906, W Beutenmuller (1, AMNH); Black Mts, 2 Jul (3, CASC); Avery Co.: Linville Falls, Blue Ridge Parkway mi 317, 16 Aug 1981, *Rhododendron* litter, S Peck (5, PECK); Yancy Co.: Black Mts, Blue Ridge Parkway mi 352, 15 Aug 1981, 4900', log-leaf litter, S Peck (1, PECK); Black Mts Blue Ridge Parkway mi 352, 15 Jul 1981, 4900', leaf litter, S Peck (1, PECK). *Tennessee*: Sevier Co.: Gt. Smoky Mts. NP Elkmont, 8 Jun 1960, 2250', leaf litter, W Suter, J Wagner (1, FMNH); Unocol Co.: Unaka Mtn, 5 Jul 1953 (1, CMNC).

DISCUSSION: This species has been collected from log, leaf, and *Rhododendron* litter. Altitude records are from 2250 to 4900 ft.

Agathidium bushi Miller and Wheeler, new species

Figures 164, 329–331, 375

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “VA: Lee Co. Cumberland Gap Nat. Pk nr. Skylight Cave 10.VII.1971, ex./Ber. dry litter at log. Wshear SLS Lot # C2/HOLOTYP *Agathidium bushi* Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: United States, Virginia, Lee Co., Cumberland Gap National Park near Skylight Cave.

DIAGNOSIS: This species is externally similar to other members of the *A. dentigerum* subgroup that lack a modified gula. The metasternum is relatively conspicuously setose, though perhaps not more strongly so than most other members of the group. Most of the specimens examined have the medial mesosternal carina effaced. The median lobe is diagnostic and in lateral aspect is approximately straight from near the base to the sharply pointed apex (fig. 330). In ventral aspect the lateral margins of the apical portion are evenly convergent to the narrowly rounded apex (fig. 329).

DESCRIPTION: Body moderately large (TBL

= 2.88–3.23 mm), rounded, robust (PNW/TBL = 0.44–0.49), strongly contractile.

Head, pronotum, and elytra yellow-red; venter yellow; antennae, palpi, and legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.52–0.54), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation on most specimens; frontoclypeal suture obsolete medially; eyes prominent, protruding, somewhat dorsoventrally compressed, large-faceted; gula concave; antennomere ratios: length I:II:III = 1.6:1.0:1.3, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad (PNL/PNW = 0.73–0.90), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures smooth, with fine microreticulation on many specimens. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.92–0.99); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina completely obscured. Metasternum narrow (MTL/MTW = 0.16–0.17), medial area slightly convex, surface with numerous fine setae, slightly sloped dorsad anteriorly; oblique femoral carinae reduced, rounded, medially with narrowly rounded, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with acuminate, sharp, large tooth on posterior margin (fig. 164); metasternal fovea large, transversely oval, with large, dense brush of long, fine setae. Median lobe in lateral aspect moderately robust, strongly bent basally, relatively straight thereafter, slightly expanded medially, apical portion broad, evenly tapered to pointed, slightly dorsally curved apex (fig. 330); in ventral aspect broad, medially somewhat expanded, apical portion evenly narrowed to rounded apex (fig. 329); operculum divided into two long, slender rami, apices slightly divergent and each narrowly rounded (fig. 329); lateral lobes moderately broad, bent basally, straight

thereafter, apices narrowly rounded with 2 long subapical setae (fig. 331).

Female not examined.

ETYMOLOGY: This species is named in honor of G.W. Bush (Crawford, TX), President of the United States.

DISTRIBUTION: This species is found in Ohio, Virginia, and North Carolina (fig. 375).

PARATYPES: UNITED STATES: *North Carolina*: Valley of Black Mts, 18 Aug 1906, W Beutenmuller (1, AMNH); Mt Michell, 4000' (1, MCZC). *Ohio*: Adams Co.: 2 mi SE Blue Creek, 8 Aug 1976, forest litter, Berlese, LE Watrous (1, QDWC).

DISCUSSION: Habitat records include forest and leaf litter. A single altitude record is from 4000 ft.

Agathidium georgiaense Miller and
Wheeler, new species
Figures 165, 332–334, 373

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "GA: Dade Co., Cloud land Canyon St. Prk. 16.v.1972, S.&.J.Peck Rhodo. litter, B236/HOLOTYPE *Agathidium georgiaense* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: United States, Georgia, Dade Co., Cloudland Canyon State Park.

DIAGNOSIS: This species is very similar to several species in this subgroup. It is nearly identical to *A. gallititillo* (see "Diagnosis" under that species) from which it differs mainly in the shape of the male genitalia. Whereas the apical portion of the median lobe is deflected ventrad in *A. gallititillo* (fig. 324), it continues in approximately the same line as the medial portion of the median lobe in *A. georgiaense* (fig. 333). The pro- and mesobasotarsomeres are relatively broadly expanded in males of this species.

DESCRIPTION: Body moderately large (TBL = 2.31–2.68 mm), rounded, robust (PNW/TBL = 0.50–0.51), strongly contractile.

Head and pronotum red to dark red; elytra dark red; venter, antennae, palpi, and legs yellow to yellow-brown.

Head broad (MDL/OHW = 0.52–0.54), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures

tures shiny, with fine microreticulation; frontoclypeal suture obsolete medially; eyes prominent, protruding, slightly dorsoventrally compressed, large-faceted; gula concave anteriorly, slightly swollen medially; antennomere ratios: length I:II:III = 1.3:1.0:1.0, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large, broad (PNL/PNW = 0.63–0.68), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.99–1.07); punctation similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum broad, broadly convex; medial carina well developed. Metasternum very narrow medially (MTL/MTW = 0.09–0.10), medial area slightly convex, slightly sloped dorsad anteriorly; oblique femoral carinae obscured, low, rounded, medially with broad, flat, subtriangular, posteriorly directed flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur slender, subapical posterior tooth moderately large, triangular, acutely pointed (fig. 165); metasternal fovea large, transversely oval, with large brush of long fine setae. Median lobe in lateral aspect long, slender, curved basally, moderately straight thereafter, apical portion long, slender, tapered, in same line of curvature as medial portion, apically bent dorsad, very finely pointed, without small dorsal prominence (fig. 333); in ventral aspect slender, somewhat expanded medially, apical portion slightly constricted, expanded apically, apex broadly rounded (fig. 332); operculum divided, rami long but ending well short of apex of median lobe, slender, relatively straight through most of length, with apices narrowly rounded and divergent (fig. 332); lateral lobes slender, long, bent basally, straight in apical portion (fig. 334).

Female not examined.

ETYMOLOGY: This species is named after the state of origin of the type specimens.

DISTRIBUTION: This species is known only from the type locality in Georgia (fig. 373).

PARATYPES: UNITED STATES: *Georgia*: Dade Co.: Cloudland Canyon St. Park, 16 May 1972, *Rhododendron* litter, S and J Peck (8, PECK).

DISCUSSION: The type series was collected from *Rhododendron* litter.

Agathidium microphthalmum Subgroup

DISCUSSION: This species subgroup is united by small body size, the very strongly reduced eyes, the large male metafemoral tooth, and distribution in southern Mexico and Guatemala. The three species are externally fairly similar but may be distinguished by the small size and shape of the eyes (figs. 110–112) and by the shape of the male genitalia with the median lobe lacking lateral carinae and sulci and the lateral lobes apically straight (figs. 335–343).

Agathidium chauliodoum Miller and Wheeler, new species

Figures 112, 166, 335–337, 376

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "GUAT: BAJA VERAPAZ: 7.5 km S Purulha. Elev. 1630 m. cloud for. litter. R. Anderson 91-26, 26-V-1991/HOLOTYPE *Agathidium chauliodoum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Guatemala, Baja Verapaz, 7.5 km S Purulha.

DIAGNOSIS: Males of this species may be distinguished from most species by the strongly reduced eyes consisting of dorsally directed ovoids (fig. 112), and by the large metafemoral tooth (fig. 166) and distinctive male genitalia with the median lobe stout and apically abruptly curved and sharply pointed in lateral aspect (fig. 336). The species is most similar to *A. microphthalmum* and *A. nimbosilva*, from which it may be distinguished by slightly larger eyes and differences in the shape of the median lobe and the more broadly expanded male probasotarsomeres.

DESCRIPTION: Body small (TBL = 2.21–2.43 mm), broad, robust (PNW/TBL = 0.43–0.52), rounded, strongly contractile.

Head piceous; pronotum piceous, testaceous around margins; elytra piceous, slightly iridescent laterally; venter dark red; antennae, palpi, and legs red-brown.

Head broad (MDL/OHW = 0.58–0.69),



Fig. 376. Geographic distribution of *Agathidium oniscoides*-group species: *A. chauliodoum* = ■; *A. microphthalmum* = ●; *A. nimbosilva* = ★.

dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes strongly reduced to ovoids, directed dorsally (fig. 112); gula flat or slightly convex; antennomere ratios: length I:II:III = 1.6:1.0:1.7, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad (PNL/PNW = 0.70–0.74), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.79–1.14); punctation and surface similar to pronotum; sutural stria present only apically. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.15–0.18), slightly concave medially, strongly dorsally sloped anteriorly; oblique femoral

carinae well developed, meeting medially in broad, broadly truncate flange.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, protarsomeres more strongly so and with large ventral field of spatulate setae; mandibles not modified; metafemur broad, with very large, flat, triangular tooth subapically on posterior margin (fig. 166); metasternal fovea moderate in size, transverse, with pencil of dense, fine, long setae. Median lobe in lateral aspect broad and robust, abruptly curved basally, apical portion short, slender, strongly hooked ventrally, apex sharply pointed (fig. 336); in ventral aspect robust, widened medially, apical portion broadly triangular (fig. 335); operculum flat, broad, lateral margins slightly divergent apically, apex broadly rounded (fig. 335); endophallic armature comprised of a main medial hyaline lobe that is apically truncate, a long hyaline lobe on each side, a strongly diverging, long hyaline lateral lobe on each side and a long dorsolateral hyaline lobe on each side; lateral lobes long, slender,

strongly curved, apices directed medially, apex slightly expanded, with 2 stout setae subapically (fig. 337).

Female not observed.

ETYMOLOGY: Named *chauliodoum* from the Greek word for "having prominent teeth" for the very large teeth on the posterior margin of the metafemora.

DISTRIBUTION: This species is known only from Baja Verapaz, Guatemala (fig. 376).

PARATYPES: GUATEMALA: *Baja Verapaz*: 14.5 km S Purulha, 26 May 1991, 1600 m, riparian bottomland oak forest litter, R Anderson (1, CNCI); 3 km SW Purulha, 20 Nov 1991, litter, cloud forest, R Baranowski (19, JRAC); 7 km E Purulha, 22 May 1991, 1600 m, cloud forest litter, RS Anderson (1, CNCI); 8 km S Purulha, 20 May 1991, 1600 m, pine-cloud forest litter, RS Anderson (1, CNCI).

DISCUSSION: This species has been collected from cloud forest litter and riparian bottomland oak forest litter. Altitude records are from 1600 m.

***Agathidium microphthalmum* Miller and Wheeler, new species**
 Figures 110, 167, 338–340, 376

TYPE MATERIAL: Holotype, ♂ in CMNC labeled "MEXICO: Chiapas: Volcan Tacana, lower slopes, ca. 4 km N Union Juarez, 19-IX-1992. R.S. Anderson 92-110/HOLOTYPE *Agathidium microphthalmum* Miller and Wheeler, 2003 [red label with black line border]".

TYPE LOCALITY: Mexico, Chiapas, Volcan Tacana, lower slopes, ca. 4 km N Union Juarez.

DIAGNOSIS: Males of this species may be distinguished from most species by the strongly reduced eyes consisting of minute, slightly elongate triangles (fig. 110), the large metafemoral tooth (fig. 167), and distinctive male genitalia with the median lobe moderately slender and with the apex hooked and slightly expanded in lateral aspect (fig. 339). The species is most similar to *A. chauliodoum* and *A. nimbosilva*, from which it may be distinguished by smaller eyes, less laterally expanded male probasotarsomeres (to distinguish it from *A. chauliodoum*), and differences in the shape of the median lobe (figs. 338, 339).

DESCRIPTION: Body small (TBL = 2.39 mm), broad, robust (PNW/TBL = 0.48), rounded, strongly contractile.

Head dark red-brown; pronotum dark red-brown medially, red along margins; elytra dark red-brown medially, red along margins, not iridescent; venter, antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.53–0.55), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes strongly reduced to small triangles, only a few facets present (fig. 110); gula flattened, unmodified; antennomere ratios: length I:II:III = 2.0:1.0:1.4, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large (PNL/PNW = 0.71–0.72), broad, strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 1.00–1.12); punctuation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.12–0.15), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae well developed, meeting medially in low, but prominent carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres distinctly laterally expanded, about equally so, each with moderate field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with very large, flat, triangular tooth subapically on posterior margin (fig. 167); metasternal fovea minute with small pencil of fine setae. Median lobe in lateral aspect stout, strongly curved basally, straight in medial portion apically flexed dorsad, apical portion slender, straight, apex abruptly expanded with dorsal and ventral points (fig. 339); in ventral aspect parallel-sided for most of length, apex evenly tapered to narrowly rounded apex (fig. 338); operculum broad, flat, apically broadly rounded (fig. 338); lateral lobes long, slender,

strongly curved basally, apically with 2 stout setae (fig. 340).

Female tarsi 5-4-4.

ETYMOLOGY: This species is named from the Greek words *micro*, meaning “small”, and *ophthalmos*, meaning “eye”, in reference to the very reduced eyes in this species.

DISTRIBUTION: This species is known only from the type locality in Chiapas (fig. 376).

PARATYPES: MEXICO: *Chiapas*: Volcan Tacana, lower slopes, 4 km N Union Juarez, 19 Sep 1992, 2000 m, cloud forest litter, RS Anderson (5, CNCI).

DISCUSSION: The type specimens were collected from cloud forest litter at 2000 m.

Agathidium nimbosilva Miller and
Wheeler, new species
Figures 111, 168, 341–343, 376

TYPE MATERIAL: Holotype, ♂ in CMNC labeled “GUATEMALA: BAJA VERAPAZ: 7 km E Purulha. Elev. 1600 m. cloud for. litter. R. Anderson 91-15 23-V-1991/HO-LOTYP *Agathidium nimbosilva* Miller and Wheeler, 2003 [red label with black line border]”. Only a single specimen is known of this species.

TYPE LOCALITY: Guatemala, Baja Verapaz, 7 km E Purulha.

DIAGNOSIS: Males of this species may be distinguished from most species by the strongly reduced eyes consisting of minute, slightly elongate triangles (fig. 111), a small but distinct and sharp metafemoral tooth (fig. 168), and distinctive male genitalia with the median lobe moderately robust and with the apex slender and approximately straight (fig. 342). The species is most similar to *A. chauliodoum* and *A. microphthalmum*, from which it may be distinguished by smaller eyes, less laterally expanded male probasotarsomeres (both to distinguish it from *A. chauliodoum*), a smaller metafemoral tooth and differences in the shape of the median lobe (figs. 341, 342).

DESCRIPTION: Body small (TBL = 2.16 mm), broad, robust (PNW/TBL = 0.49), rounded, strongly contractile.

Head dark red-brown; pronotum dark red-brown medially, red along margins; elytra dark red-brown medially, red along margins,

not iridescent; venter, antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.55), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, very lightly microreticulate; frontoclypeal suture obsolete medially; eyes strongly reduced to small triangles, only a few facets present (fig. 111); gula flattened, not modified; antennomere ratios: length I:II:III = 1.2:1.0:1.7, width VII:VIII:IX = 1.0:1.0:2.2. Pronotum very large, broad (PNL/PNW = 0.74), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, smooth. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.98); punctation and surface similar to pronotum; sutural stria absent. Flight wings strongly reduced. Mesosternum moderately broad, not declivitous; medial carina well developed. Metasternum narrow (MTL/MTW = 0.12), flat medially, distinctly dorsally sloped anteriorly; oblique femoral carinae well developed, meeting medially in low, but prominent carina.

Male tarsi 5-5-4; pro- and mesobasotarsomeres not strongly laterally expanded, equally so and with a moderate field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with very large, flat, triangular tooth subapically on posterior margin (fig. 168); metasternal fovea moderately large, transversely oval with dense brush of long fine setae. Median lobe in lateral aspect moderately short, stout, strongly curved basally, straight in medial portion apically flexed dorsad, apical portion slender, straight, apex slender and pointed (fig. 342); in ventral aspect parallel-sided for most of length, apex evenly tapered to narrowly rounded apex (fig. 341); operculum broad, flat, apically broadly rounded (fig. 341); lateral lobes long, slender, strongly curved basally, apically with 2 stout setae (fig. 343).

Female not observed.

ETYMOLOGY: Named from the Latin words *nimbus*, meaning “rain cloud”, and *silva*,

meaning "forest", for the habitat where the type specimen was collected.

DISTRIBUTION: This species is known only from the type locality in Baja Verapaz, Guatemala (fig. 376).

DISCUSSION: The type specimen was collected from cloud forest litter at 1500 m.

Agathidium oniscoides Subgroup

DISCUSSION: These species are not characterized by any particularly discrete characters, but share a general similarity in body form and aedeagal shape. There are two species pairs in this group. One of these is *A. oniscoides* and *A. rubellum*, which have nearly identical male genitalia and relatively short elytral sutures. The other two are *A. fawcettae* and *A. exiguum*, which have dorsal microreticulation, relatively long elytral sutures and somewhat similar genitalia. These are some of the most common species in North America.

Agathidium oniscoides Palisot de Beauvois Figures 169, 344–347, 377

Agathidium oniscoides Palisot de Beauvois, 1817: 160; LeConte, 1853; Horn, 1880; Matthews, 1887; Leng, 1920; Fall, 1934b; Wheeler, 1990 (description of larva).

Agathidium globatile LeConte, 1878: 598; Horn, 1880 (synonymized with *A. oniscoides*); Leng, 1920.

Agathidium piceum Melsheimer, 1844: 103; LeConte, 1853 (synonymized with *A. oniscoides*), Matthews, 1887; Leng, 1920, *nec* Erichson, 1845.

TYPE MATERIAL: *Agathidium oniscoides*: type (presumably in Paris) not examined.

Agathidium globatile: lectotype (designated here to clarify assignment of this name to this species), ♀ in MCZC labeled "Mic./613. [handwritten]/Type 3180 [number handwritten, two-thirds of label red]/*A. globatile* Lec. [handwritten]/*oniscoides* 6 [handwritten]". Paralectotype, 1 ♀ in MCZC labeled "Marquett 29-1 Mich/13". LeConte had multiple specimens on which he based his description, and other specimens accompany these two but are not clearly part of the type series.

Agathidium piceum: holotype (sex not determined) in MCZC labeled "[circular pink disc]/*Agathidium oniscoides* Beau *piceum* Mels. [handwritten]".

TYPE LOCALITY: *Agathidium oniscoides*: United States, South Carolina.

Agathidium globatile: United States, Michigan, Detroit [here restricted].

Agathidium piceum: United States, Pennsylvania.

DIAGNOSIS: This species is the largest in the genus in North America and is often very black in color, making it easily distinguishable from most species. The shape of the median lobe is distinctive with the apical portion long, directed at an angle dorsad, slightly expanded medially along dorsal margin in lateral aspect (fig. 346), and with the operculum narrow and long with the apex slightly to moderately laterally expanded (fig. 344). The male metafemoral tooth is small (fig. 169) and the metasternal fovea is moderately large. The sutural stria extends about one-fifth to one-third the length of the elytron. This species is extremely similar to *A. rubellum*, from which it can be distinguished by larger size, darker coloration, and larger metasternal fovea.

DESCRIPTION: Body moderate to very large (TBL = 2.57–4.74 mm), oblong (PNW/TBL = 0.44–0.54), strongly contractile.

Head, pronotum, and elytra dark red to piceous; venter yellow to yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.61–0.64), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation; frontoclypeal suture obsolete medially; gula without tubercle; eyes rounded, not compressed, prominent, small-faceted; gula slightly convex; antennomere ratios: length I:II:III = 2.2:1.0:2.3, width VII:VIII:IX = 1.0:1.0:1.6. Pronotum very large, broad (PNL/PNW = 0.65–0.82), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation. Elytra broad, slightly elongated, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.88–1.01); punctuation similar to pronotum; sutural stria extending from apex to one-fifth to one-third length of elytron. Flight wings fully developed in most specimens, some

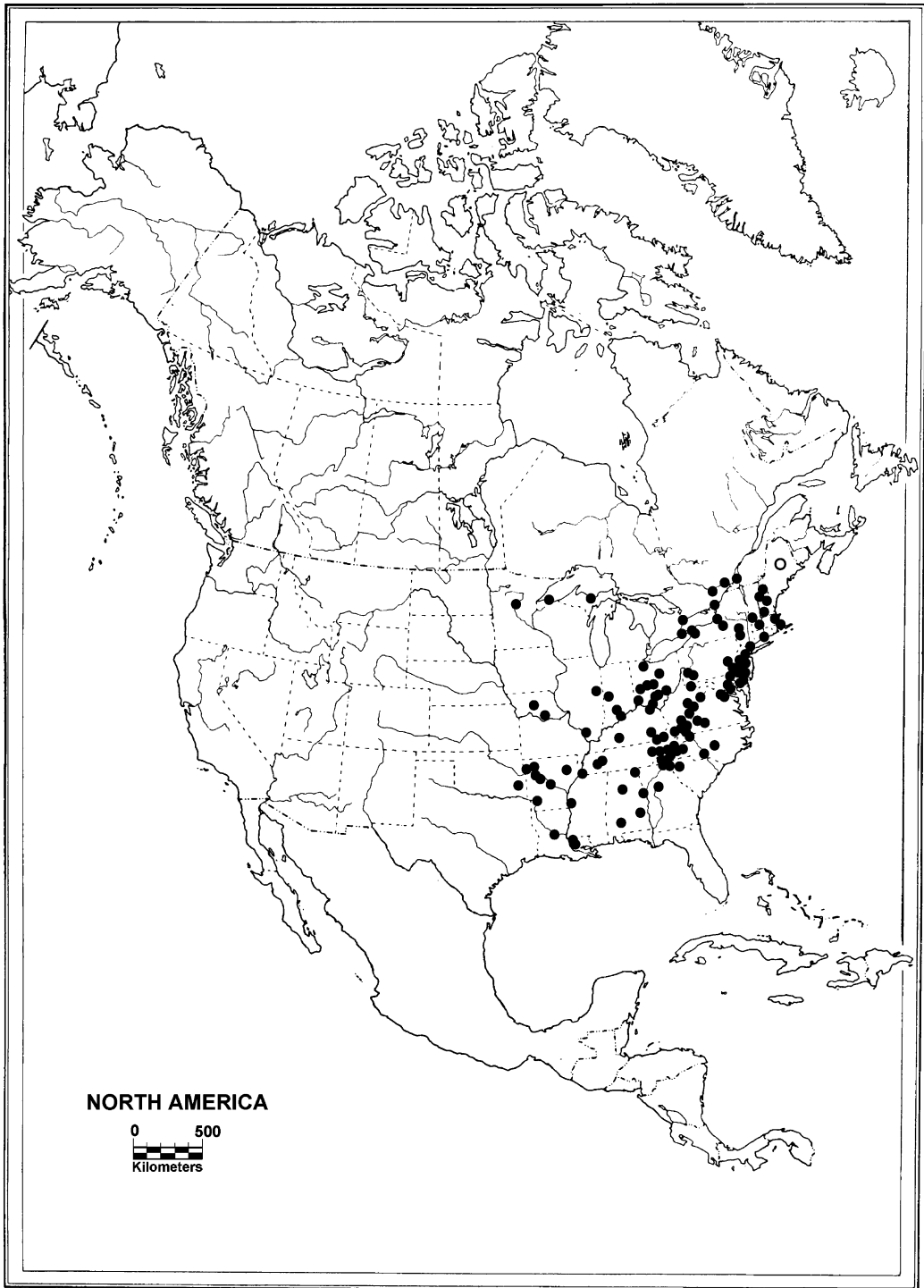


Fig. 377. Geographic distribution of *Agathidium oniscoides* (○ = state record only).

specimens with wings reduced. Mesosternum broad, broadly convex; medial carina obscured anteriorly. Metasternum relatively narrow (MTL/MTW = 0.14–0.28), medially flat, gently sloped anteriorly, without posterior flange; oblique femoral carinae obscured, low, not prominent, low where they meet medially.

Male tarsi 5-5-4; pro- and mesobasotarsomeres somewhat laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur broad, with small subapical tooth on posterior margin (fig. 169); metasternal fovea posterior, moderately large, transversely oval, with large brush of fine, dense setae. Median lobe in lateral aspect long, slender, evenly curved basally, apical portion short, very slender, straight, directed at angle dorsally, slightly expanded medially, apex pointed (fig. 346); in ventral aspect very slender, lateral margins parallel, apical portion tapered to broadly rounded, slightly laterally expanded apex (figs. 344, 345); operculum long, nearly attaining apex of median lobe, evenly tapered in ventral aspect, subapically abruptly expanded laterally to evenly rounded (figs. 344, 345); lateral lobes long, slender, evenly curved basally, apically slightly sinuate, apex narrowly rounded with 2 stout setae. (fig. 347).

Female tarsi 5-4-4.

DISTRIBUTION: This species is common and widespread in eastern North America (fig. 377). Matthews (1887) reported it from Jalisco, Mexico, but this certainly refers to a different species.

SPECIMENS EXAMINED: CANADA: *Ontario:* Hamilton, 28 Jun 1982, M Sanborne (1, CNCI); Grimsby, J Pettit (8, CNCI); Rondeau Pr. Park, 5 Jun 1981, on slime mold, R Anderson (9, CNCI); Chaffrey Locks QUBS, 19 Oct 1980, rotten logs, on "fungi", S Peck (1, PECK); Chaffrey Locks QUBS, 2 Sep 1980, litter, on "fleshy fungi", S Peck (2, CNCI); Leeds and Grenv. Co., 2 km SE Spencerville, 30 Apr 1979, A and Z Smetana (1, CNCI); Ottawa, Hunt Club forest, 22 May 1985, rotten logs, A Davies, W Hamilton (2, CNCI); Prince Edward Co. Brimley, 12 May 1935 (3, CNCI). *Quebec:* Rigaud, 15 May 1973, EJ Kiteley (2, CNCI); Montreal, 17 Sep 1968, EJ Kiteley (1, CNCI); Rigaud end Ch. De la Croix, 5 May 1988, A and Z Smetana (1, CNCI).

UNITED STATES: *Alabama:* Cheaha St. Park,

27 Apr 1940, Van Dyke (1, CASC); Auburn, 31 Mar 1969, EJ Kiteley (1, CNCI); Cleburn Co.: Cheaha St. Park, 13 Jun 1967, leaf, log litter, S Peck A Fiske (1, PECK); Cleburne Co.: Cheaha St. Park, 33°29'02"N, 85°49'00"W, 18 May 1998, under oak log bark, CE Carlton (2, LSAM); Jackson Co.: McFarland Cove, 8 May 1972, S and J Peck (1, PECK); Jefferson Co.: Hoover, 12 Apr 1982, U.V., T King (1, CNCI); Monroe Co.: Haines Island Park 31°43'23"N, 87°28'10"W, 26 May 1995, beech/magnolia, Berlese, CE Carlton (5, LSAM). *Arkansas:* Hope (1, MCZC); Faulkner Co.: 10 mi E Conway at Field Trail area, 20 Mar 1991, bottomland, Berlese, CE Carlton (3, LSAM); Jackson Co.: 1.2 mi W Amagon on Hwy 14, 17 Apr 1977, Berlese, R Chenowith (1, LSAM); Logan Co.: Cove Lake RA, 16 Jun 1990, CE Carlton (1, LSAM); Madison Co.: Withrow Spr. St. Park, 27 Oct 1974, 1400', mixed hardwood forest ground litter, Berlese, AF Newton (1, CNCI); Withrow Spring St. Park, 17 Oct 1979, 1400' (1, MCZC); Washington Co.: 3 mi S Devils Den St. Park, 28 May 1979, oak hickory forest, S and J Peck (4, CNCI); Yell Co.: SE slope Mt Magazine at Workman Cabin, 12 Apr 1991, in logs, CE Carlton (1, LSAM); 4.0 mi S Blue Mt Lake, 4 May 1992, deciduous forest, Berlese, C Carlton (3, LSAM); 4 mi S Blue Mtn Lake, 13 Mar 1991, runoff gully, CE Carlton (1, LSAM); Dry Creek Wildl. Area, 3 May 1992, deciduous forest, Berlese, C Carlton (1, LSAM). *Connecticut:* Groton, KP Jansson (2, LUND); New London Co.: 3 mi N Groton, 4 Sep 1976, rotting leaves, LE Watrous (2, QDWC). *Delaware:* state only (1, MCZC). *District of Columbia:* district only (2, MCZC). *Georgia:* Clayton, Jun 1909 (1, QDWC); Clayton, 2000–3700' (1, CNCI); near Atlanta, 6 May 1899, JH Emerton (1, MCZC); Clayton, Jun 1909 (1, QDWC); Rabun Co.: Black Rock Mtn St. Park, Mountain City, 16 Sep 1959, oak duff, Berlese, W Suter, J Wagner (1, CNCI); Satahah, 13 Jun 1957, WRM Mason (3, CNCI). *Illinois:* Mahomet, Nettie Hart Memorial Woods, 22 May 1966, under bark, MW Sanderson (2, CNCI); Champaign Co.: Mahomet, Hart Woods, 20 May 1979, oak woods, malaise FIT, S and J Peck (2, CNCI); 3.5 mi NE Mahomet, 16 Nov 1966, ground litter, MW Sanderson (1, CNCI); Union Co.: Pine Hills Field Sta., 15 May 1967, rotten log, Berlese, JM Campbell (4, CNCI). *Indiana:* Mitchell, 16 Sep 1910 (1, MCZC); Crawford Co.: 30 Aug 1923 (1, CASC); Parke Co.: 8 mi N Rockville, wood east Turkey Run State Park, 5 Aug 1977, L and N Herman (1, AMNH). *Kentucky:* state only (4, OSUC); state only (6, MCZC); Sanborn (1, MCZC); Pennyroyal St. Park nr Dawson Springs, 22 Mar 1983, JM Campbell (1, CNCI); Mammoth Cave Natl Park, 22 Aug 1967, forest

carrion, S Peck (1, CNCI); Smiths (1, CASC); Edmonson Co.: Mammoth Cave Natl. Park Cabin Woods, 24 Mar 1973, litter, W Suter (2, FMNH); Laurel Co.: 15 mi W London, 4 Jun 1984, S Marshall (1, PECK); Bald Rock Picnic Area, 4 Jun 1991, hardwood, Berlese, CE Carlton (1, LSAM). *Louisiana*: Stuart Natl For. 3 km SW Pollock, 13 May 1985, FIT, H and A Howden, C. Sholtz (1, CNCI); E Baton Rouge Co.: Baton Rouge, 1 Oct 1986, SP Brown (1, LSAM); W Feliciana Co.: 12 km SE St Francisville, 1 Jun 1995, D Pashley (1, LSAM); Tunica Hills WMA, 23 Sep 1995, D Colby, D Landau (1, LSAM); 6 mi ESE St Francisville, Feliciana Pres, 26 Jan 1999, JL Johnson (1, LSAM); cabin area 30°47'N, 91°15'W, 1 Feb 2001, pitfall, AR Cline (1, LSAM); Tunica Hills WMA, 11 May 1995, pitfall, D Pashley (3, LSAM); Feliciana Preserve, 6 mi ESE St Francisville, 30°45'N, 91°16'W, 25 Feb 1996, under bark, Carlton, Leschen (1, LSAM). *Maine*: Moamouth, 27 Jun 1906 (3, MCZC). *Maryland*: state only (1, MCZC); College Park, 20 Jul 1949, HF Howden (1, CMNH); Caroline Co.: Williston, 2 Jun 1970, creekbank, C Alteri (1, PECK); Williston, 2 Jun 1970, creekbank, C Alteri (4, CNCI); Harford Co.: Belcamp, 16 Jun 1976, forest litter, Berlese, LE Watrous (1, QDWC); Pr. Geo. Co.: Patuxent Wildlife Refuge, 11 Jun 1983, rotten wood and fungi, DS Chandler (1, DENH). *Massachusetts*: state only (1, MCZC); Northfield, 26 Aug 1898 (2, MCZC); Arlington, 11 Apr 1924 (1, MCZC); Northfield, 26 Aug 1898 (1, MCZC); Framingham, 27 May 1927, at light (1, MCZC); Drac. (4, MCZC); Tyngsboro, 3 Sep 1893 (2, MCZC); Middlesex Co.: Estabrook Woods, Concord, 14 Nov 1976, leaf litter mixed hardwood conifer forest, A Newton, M Thayer (1, MCZC); Bedford, MCZ Concord Field Sta., 1 Aug 1980, on *Ceratiomyxa feticulosa*, A Newton, M Thayer (1, MCZC); Bedford, Concord Field Sta. of MCZ, 18 Jul 1980, on yellow slime -mold, A Newton (23, MCZC); Bedford, MCZ Concord Fld Sta, 15 Aug 1980, on "clear myxomycete" on old oak bark pieces, A Newton, M Thayer (2, FMNH). *Michigan*: state only (3, MCZC); Marquette (1, MCZC). *Minnesota*: Brainard, 17 Jun 1962, EJ Kiteley (1, CNCI). *Mississippi*: Washington Co.: Leroy Percy State Park, 9 Jun 1959, J Wagner, W Suter (1, AMNH). *Missouri*: Lowell, 2 Sep 1893 (3, MCZC); Boone Co.: Columbia, 16 Apr 1974, SE Thewke (1, QDWC). *New Hampshire*: state only (3, MCZC); Chatham, 11 Jun 1976, WJ Morse (1, DENH); Durham, 24 Aug 1976, pitfall (1, DENH); Rumsey, 16 Jun 1924 (1, MCZC); Milton, 26 Jun 1909 (1, MCZC); Mt Washington, 25 Aug 1925, Darlington (1, MCZC); N. Conway, 1882 (6, MCZC); E Wakefield (2, MCZC); Farmington, 2 Aug 1901 (1, MCZC); Chocorua (1, MCZC); Straf Co.: Spruce Hole, 3 mi SW Durham, 27 May 1987, FIT, DS Chandler (2, CNCI). *New Jersey*: Plainfield, 27 Jun (1, MCZC); Orange Mts, Mar (1, MCZC); Westville (1, MCZC); Orange Mtn (6, OSUC); Burlington Co.: Rancocas St. Park, 28 Aug 1976, litter mixed hardwood forest, Berlese, M Thayer, A Newton (1, MCZC). *New York*: Up Saranac, 11 Jul 1928, JW Green (1, CASC); Olcott, 15 Aug 1922 (3, CASC); Newport (2, MCZC); Harrison (1, AMNH); Buffalo (2, MCZC); Katohah (1, CASC); vicinity of New York (1, AMNH); Cold Spring Harbor, 27 Jul 1932, HM Parsley (3, CASC); Albany Co.: Besselaerville, 15 Aug 1970, on *Polyporus adustus*, JF Lawrence (1, MCZC); Rensselaerville, EN Huyck Preserve, 11 Aug 1974, maple stump debris, Berlese, W Suter (1, CNCI); Greene Co.: East Durham, 14 Oct 1982, leaf litter by stream, SE Thewke (1, DENH); Oswego Co.: Selkirk Shores St. Park 6.6 mi N Mexico, 15 Jun 1979, on plasmodium (1, AMNH); Selkirk Shores St. Park 6.6 mi N Mexico, 15 Jun 1979, on plasmodium, QD Wheeler (1, QDWC). *North Carolina*: state only (8, MCZC); Valley of Black Mts, 10 Sep 1906, W Beutenmuller (2, AMNH); Raleigh, 25 May 1950, H and A Howden (1, CMNH); Balsam, 7 Jul 1917 (2, QDWC); Black Mts, 8 Sep 1911 (1, MCZC); Valley of Black Mts, 16 Sep 1906, W Beutenmuller (1, AMNH); Balsam, 7 Jul 1917, HW Wenzel (1, CASC); Black Mts, 2 Jul (10, CASC); Asheville, 21 Aug 1930, Darlington (3, MCZC); Valley of Black Mts, 22 Jul 1906, W Beutenmuller (5, AMNH); Highlands, 7 Jun 1957, WJ Brown (1, QDWC); Balsam, 7 Jul 1917, HA Wenzel (1, OSUC); Black Mts (12, AMNH); Avery Co.: Linville Falls, Blue Ridge Parkway mi 317, 2 Jun 1981, forest, FIT, S Peck (2, CNCI); Grandfather Mt. Blue Ridge Parkway, mi 304, 17 Aug 1981, 4000', leaf litter, S Peck (3, CNCI); Linville Falls, Blue Ridge Parkway mi 327, 16 Aug 1981, 3500', *Rhododendron* litter, S Peck (1, PECK); Grandfather Mtn, 14 Oct 1985, R Baranowski (1, LUND); Buncombe Co.: Great Cragy Mts Blue Ridge Park, mi 171, 2 Jun 1981, forest, FIT, S Peck (4, CNCI); Great Cragy Mts, Blue Ridge Parkway mi 371, 2 Jun 1981, 4000', FIT, S Peck (1, PECK); Macon Co.: Highlands, 6 Jun 1981, QD Wheeler (1, FMNH); 4 mi N Franklin, 21 Mar 1976, *Rhododendron* litter, QD Wheeler (7, QDWC); 6 Jun 1981, QD Wheeler (3, QDWC); 4 mi N Franklin, 20 Mar 1976, *Rhododendron* litter nr stream, QD Wheeler (1, QDWC); 1.5 mi NW Highlands, 2 Jul 1983, hemlock/pine litter, J Pakaluk (2, AMNH); McDowell Co.: Deerlick Gap Overlook, BR Parkway 2.2 mi SW intersec 221, 2 Jun 1991, CE Carlton (5, LSAM); Montgomery Co.: Uwharie, 5 Oct 1985, R Baranowski

(1, LUND); Surry Co.: Pilot Mtn State Park, 6 Oct 1985, R Baranowski (2, LUND); Transylvania Co.: Mt Pisgah, Blue Ridge Parkway mi 414, 3 Jun 1981, forest, FIT, S Peck (1, CNCI); Wake Co.: Reedy Creek Raleigh, 28 Mar 1965, logs, litter (1, CUIC); Yancy Co.: Black Mts, Blue Ridge Parkway mi 352, 15 Aug 1981, 4900', leaf litter, S Peck (1, PECK). *Ohio*: Cedar Swp., 4 Jul 1950, NJ and DL Sleeper (2, OSUC); Cincinnati, 19 Aug 1922 (2, MCZC); Portage, 10 Aug 1973, RL Hall (1, QDWC); Clayton, 5 Apr 1940, Van Dyke (1, CASC); Adams Co.: 2 mi SE Blue Creek, 8 Aug 1976, forest litter, Berlese, LE Watrous (1, QDWC); Ashland Co.: Mohican Mem. St. Forest, 30 May 1987, PW Kovarik (5, OSUC); Delaware Co.: 30 Sep (3, OSUC); Hocking Co.: 3 mi W 33 on 116, 26 Apr 1975, LE Watrous (1, QDWC); 7 mi S Lancaster, 2 May 1975, LE Watrous (1, QDWC); Rockbridge, 20 Sep 1975, forest litter, DS Chandler (1, QDWC); Noble Co.: Wolf Run Park, 7 Jun 1975, DS Chandler (1, QDWC); Ross Co.: Scioto Trails St. Forest, 25 Oct 1975, forest litter, Berlese, LE Watrous (1, QDWC); Union Co.: Marysville, 5 Sep 1975, QD Wheeler (1, QDWC). *Oklahoma*: Farris, 19 Jun 1983, hardwood log, BF and JL Carr (2, CARR); Latimer Co.: Sep 1984, K Stephan (2, KSIC); 25 Feb 1985, litter, grass, FIT, K Stephan (1, KSIC). *Pennsylvania*: state only (1, MCZC); Bethlehem, 4 July (4, MCZC); Wisahickn Creek, 3 July (1, MCZC); Pittsburg, Sep 1922 (4, CMNH); Jeanette, Sep (3, CMNH); Bethlehem (1, CASC); Allegheny (3, MCZC); Wisahickn Creek, 3 July (1, MCZC); Easton, 17 Jul 1930, JW Green (1, CASC); Chestnut Hill, 3 June (4, MCZC); Easton, 7 Sep 1934 (1, CASC); Frankford, 13 Jul (1, OSUC); Angora, 18 June, Darlington (1, MCZC); Allegheny Co.: nr Sutersville, 16 Jul 1977, W Suter (1, CNCI); West. Co.: Forbes St. Forest Laurel Summit, 10 Jul 1984, 2700', oak litter, DS Chandler (1, CNCI). *South Carolina*: Clemson, 16 Mar 1940, van Dyke (3, CASC); Oconee Co.: 12 mi NW Walhalla, Oconee St. Park, 5 Jun 1981, 1700', bark litter, S Peck (11, CNCI); 7 mi S NC State line on Hwy 107, 29 May 1983, forest litter, DS Chandler (2, DENH). *Tennessee*: Knoxville, 12 Apr 1963, under rotten log, JA Payne (1, QDWC); Madison Co.: E Jackson, 1959, AF Archer (1, AMNH); Sevier Co.: 3 mi W Cosby, 19 Aug 1981, wood chips, Q Wheeler (1, QDWC); GSMNP, Laruel Falls Trail 83°35'36"W, 35°40'19"N, 1 Jul 2001, C Carlton, V Moseley, A Tischechkin (1, LSAM); Shelby Co.: Meeman-Shelby St. Park, 10 May 1986, JM Campbell (2, CNCI). *Vermont*: Bennington Co.: Little Equinos Mtn, 25 Sep 1976, litter mixed hardwood forest, Berlese, A Newton, M Thayer (1, MCZC). *Virginia*: 2 mi NW West Augusta, 12 Sep 1975, DS

Chandler (1, QDWC); Gt. Falls, 1 Sep 1906 (1, MCZC); Falls Church, 23 Oct (1, MCZC); Mountain L., 22 Jul 1938, LJ and MJ Milne (1, CNCI); Pennington Gap, 7 July (1, MCZC); Bedford Co.: Blue Ridge Parkway mi 55, White Oak Flat, 21 May 1981, FIT, S Peck (1, CNCI); Bland Co.: Big Walker Lookout, 11 Oct 1985, R Baranowski (2, LUND); Fairfax Co.: Turkey Run, 26 Aug 1976, under bark, *Tilia* sp., A Newton, M Thayer (5, MCZC); Lee Co.: Jone's Creek (1, MCZC); Stone Creek (1, MCZC); Pulaski Co.: 7 mi SE Mechanicsburg, 9 Oct 1985, R Baranowski (4, LUND); Tazewell-Bland Co.: 4.4 mi S Burkes Garden, 30 Jun 1969, log litter, Berlese, S Peck (1, CNCI). *West Virginia*: state only (1, CASC); Reddish Knob, Shenandoah Mts, 25 Aug 1964, 4000', T Barr (1, FMNH); White Sulphur (1, CASC); Greenbrier Co.: 21 km NE Richwood, 13 May 1986, A Smetana (1, CNCI); Mercer Co.: 3 mi N Athens, 27 May 1971, dry oak leaves, W Shear (1, AMNH); Monongahila Co.: Coopers Rock St. Forest, 26 Sep 1990, 2100', on myxomycete plasmodium, SL Stephenson (1, KSIC); Pendleton Co.: Spruce Knob, 8 Jun 1967, 3500', litter, Berlese, A Fiske, S Peck (1, PECK); 5 mi S Witmer, 18 Jul 1971, 3000', forest, S Peck (7, PECK); Pocahontas Co.: E Richmond, 26 Jul 1983, L Huggert (1, LUND); Webster Co.: Monogahela NF, 11 Aug 1992, 3300', litter under *Rhododendron*, mixed hardwood forest, PR Fraissinet (1, QDWC). *Wisconsin*: Bayfield (1, MCZC); Bayfield, Wickham (2, MCZC); Bayfield, Wickham (1, AMNH).

DISCUSSION: There is some potential for confusion about the correct year of description of this species. According to Griffin (1937), pages 157–172 of Palisot de Beauvois' work were published in 1817 (Palisot de Beauvois, 1817).

Specimens from North Carolina often have the apex of the operculum more broadly flared and laterally pointed (fig. 345) than in typical specimens from the rest of the range (fig. 344). These specimens often also have a prominent, broad, anteromedial lobe on the gula and are more likely to have reduced flight wings. Although these characters would seem to indicate a separate species, they appear to grade into those of more typical specimens of the species, and specimens within series from North Carolina occasionally exhibit variation in these characters. Thus, we have chosen to group all these specimens in a single species.

This species and *A. rubellum* are extreme-

ly similar in various characters, including the shape of the male genitalia which appear to be nearly identical (figs. 348–350). However, specimens are consistently assignable to *A. rubellum* based on the red coloration, smaller size, and smaller male metasternal fovea. Thus, we have elected to continue to recognize two species.

This species has been collected from every month except January. The species has been collected from various deciduous forest habitats in leaf and log litter samples, etc. Elevation records are from 1400 to 4900 ft. Host records from label data include *Folyporus adustus*, *Fuligo septica*, *Ceratiomyxa fucicola*, “yellow slime mold”, “plasmodium”, “clear myxomycete”, “fleshy fungi”, and “fungi.”

Agathidium rubellum Fall
Figures 170, 348–350, 378

Agathidium rubellum Fall, 1934b: 105.

TYPE MATERIAL: Lectotype (designated here to clarify assignment of this name to this species), ♂ in MCZC labeled “TYPE rubellum [name handwritten, red line under “TYPE”]/M.C.Z. Type 24043/H.C. FALL COLLECTION.” There are also four paratypes from North Carolina. Fall indicated he had five specimens, but he did not formally designate a holotype. Therefore, we have selected a male specimen bearing a type label and number as the lectotype for this species.

TYPE LOCALITY: United States, North Carolina.

DIAGNOSIS: The shape of the median lobe is distinctive in this species with the apical portion long, directed at an angle dorsad, slightly expanded medially along dorsal margin in lateral aspect, and with the operculum narrow and long with the apex slightly laterally expanded (fig. 348). The male metafemoral tooth is small (fig. 170) and the metasternal fovea is minute. The sutural stria extends about one-fifth to one-third the length of the elytron. This species is extremely similar to *A. oniscoides* from which it can be distinguished by smaller size, red coloration, and smaller metasternal fovea (see “Discussion” under *A. oniscoides*). The species is also very similar to *A. exiguum* and

A. fawcettae, from which it may be distinguished by the (generally) shorter sutural stria, shape of median lobe, minute metasternal fovea, and nearly glabrous metasternum.

DESCRIPTION: Body small (TBL = 2.29–2.84 mm), oblong (PNW/TBL = 0.45–0.51), strongly contractile.

Head, pronotum, and elytra red; venter yellow to yellow-red; antennae, palpi, and legs yellow.

Head broad (MDL/OHW = 0.56–0.67), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation; frontoclypeal suture obsolete medially; gula without tubercle; eyes rounded, not compressed, prominent, small-faceted; gula slightly concave; antennomere ratios: length I:II:III = 2.0:1.0:2.2, width VII:VIII:IX = 1.0:1.0:2.1. Pronotum very large, broad (PNL/PNW = 0.64–0.78), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, with fine microreticulation. Elytra broad, slightly elongated, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.89–1.06); punctuation similar to pronotum; sutural stria extending from apex about one-third length of elytron. Flight wings fully developed. Mesosternum broad, broadly convex; medial carina well developed. Metasternum relatively narrow (MTL/MTW = 0.15–0.20), medially flat, gently sloped anteriorly, without posterior flange; oblique femoral carinae obscured, low, not prominent.

Male tarsi 5-5-4; pro- and mesobasotarsomeres slightly laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur broad, with small subapical tooth on posterior margin (fig. 170); metasternal fovea very small to minute, medial, with small pencil of long, fine setae. Median lobe in lateral aspect long, slender, evenly curved basally, apical portion short, very slender, straight, directed at angle dorsally, slightly expanded medially, apex pointed (fig. 349); in ventral aspect very slender, lateral margins parallel, apical por-

tion tapered to broadly rounded, slightly laterally expanded apex (fig. 348); operculum long, nearly attaining apex of median lobe, evenly tapered in ventral aspect, subapically abruptly expanded laterally, apex rounded (fig. 348); lateral lobes long, slender, evenly curved basally, apically slightly sinuate, apex narrowly rounded with 2 stout setae. (fig. 349).

Female tarsi 5-4-4.

DISTRIBUTION: This species is widespread in eastern North America (fig. 378).

SPECIMENS EXAMINED: CANADA: *Nova Scotia*: Cape Breton HNP, Cheticamp River Trail, 22 Sep 1984, on "mushrooms", JM Campbell, Davies (1, CNCI).

UNITED STATES: *Alabama*: Monroe Co.: Big Flat Creek 31°36'30"N, 87° 24'53"W, 27 May 1995, riparian, CE Carlton (1, LSAM). *Arkansas*: Washington Co.: 3 mi S Devils Den St Park, 28 May 1979, oak-hickory, S and J Peck (1, CNCI). *Illinois*: Savanna Co.: Miss. Palisades Park, 13 May 1979, oak woods, malaise FIT, S and J Peck (1, CNCI). *Kentucky*: Jackson Co.: The Rises St Park Sta. Camp Creek, 16 Nov 1967, Berlese, T Marsh, W Andrews (1, CNCI). *Massachusetts*: Northboro, Sep 1935, rotten logs, Frost (1, MCZC). *Missouri*: state only (1, MCZC). *Nebraska*: Lincoln, 7 Sep 1974, EJ Kitchey (1, CNCI). *New Hampshire*: Rumney, 27 Jun 1926, sweeping *Alnus*, Darlington (1, MCZC); Coos Co.: Mt Jeffers. Notch Road, 15 Sep 1987, 2200', A Smetana (1, CNCI); Straff. Co.: Spruce Hole, 2 mi SW Durham, 12 Jun 1982, beech litter, DS Chandler (1, DENH); Spruce Hole 3 mi SW Durham, 27 May 1987, DS Chandler (1, CNCI). *New York*: Mosholu, Nov, Angell (2, CNCI); Tompkins Co.: 7 mi E Ithaca, Ringwood Forest, 8 Jun 1968, rotted stump litter, Berlese, S Peck (1, CNCI). *North Carolina*: state only (4, MCZC); Black Mtn (1, AMNH); Alleghany Co.: Roaring Gap, Stone Mt St Park Rd, 18 Aug 1981, 2000', leaf litter, S Peck (1, CNCI); Cumberland Knob, Blue Ridge Parkway mi 218, 19 Aug 1981, 2700', forest leaf litter, S Peck (1, PECK); Avery Co.: Linville Falls, Blue Ridge Park mi 317, 2 Jun 1981, 3500, FIT, S Peck (2, PECK); Grandfather Mtn, Blue Ridge Parkway mi 304, 17 Aug 1981, 4000', leaf litter, S Peck (2, CNCI); Durham Co.: Durham, May 1973, blacklight, S Hughes-Schrader (1, FGAC); Macon Co.: Conee Bald, 9 Jun 1981, stump, QD Wheeler (1, QDWC); Highlands, 12 Sep 1981, QD Wheeler (2, QDWC); Highlands, 8 Jun 1981, QD Wheeler (5, QDWC); 4 mi N Franklin, 18 Mar 1976, rotten stump, QD Wheeler (2, QDWC); Wilkes Co.: Jeffres Park, Blue Ridge

Parkway, 1 Jun 1981, 3500', FIT, S Peck (1, CNCI). *Pennsylvania*: Clycoming Co.: S Williamsport, 18 Sep 1969, W Muchmore (1, CNCI); McKean Co.: Allegheny Natl For. Tionesta Scenic, 10 Aug 1984, forest litter, DS Chandler (1, CNCI); West Co.: 3 mi E Berlin, 10 Jul 1984, rotten wood, DS Chandler (1, CNCI); West. Co.: Linn Run St. Park, Linn Run, 12 Jul 1984, 2260', rotten log, DS Chandler (1, CNCI); Linn Run St. Park, Linn Run, 10 Jul 1984, 2100', leaf and bark litter, DS Chandler (1, CNCI); Westmoreland Co.: Chestnut Ridge, 9 Jun 1971, *Rhododendron* litter, WR Suter (1, FMNH). *South Carolina*: Oconee Co.: Oconee St Park, 21 Jun 1967, 1000', Berlese, S Peck, Fiske (1, PECK). *Virginia*: Tazewell-Bland Co.: 4.4 mi S Burkes Garden, 30 Jun 1968, log litter, S Peck (1, CNCI). *West Virginia*: Monongalia Co.: Coopers Rock St. Forest, 6 Aug 1986, 2100', on *Tuberifera ferruginosa*, SL Stephenson (1, AMNH); Pendleton Co.: Spruce Knob, 8 Jun 1975, 3500', litter, Berlese, Peck, Fiske (1, PECK).

DISCUSSION: This species is very similar to *A. oniscoides*. See the discussion under that species for comments on the status of these two species.

This species occurs in eastern hardwood forests where numerous specimens have been extracted from leaf and log litter. Elevation records are from 1000 to 4000 ft. Host records are from *Tuberifera ferruginosa* and "mushrooms".

Agathidium exiguum Melsheimer

Figures 171, 351-353, 379

Agathidium exiguum Melsheimer, 1844: 103; LeConte, 1853; Horn, 1880; Matthews, 1887; Leng, 1920; Fall, 1934b.

Agathidium minutum: Attributed to Melsheimer, Ms, by Melsheimer (1844). (Published in synonymy with *A. exiguum* and never made available by subsequent use as a valid name.) NOMEN NUDUM.

Agathidium ruficorne LeConte, 1850: 222; 1853 (synonymy with *A. exiguum*); Leng, 1920.

Agathidium californicum Horn, 1880: 303; Matthews, 1887; Leng, 1920; Fall, 1934b; Hatch, 1957. NEW SYNONYM.

Agathidium alutaceum Fall, 1934b: 107. NEW SYNONYM.

TYPE MATERIAL: *Agathidium exiguum*: lectotype (designated here to clarify association of this name with this species), ♂ in MCZC labeled "[circular blue disc]/Type 3188 [number handwritten, two-thirds of label

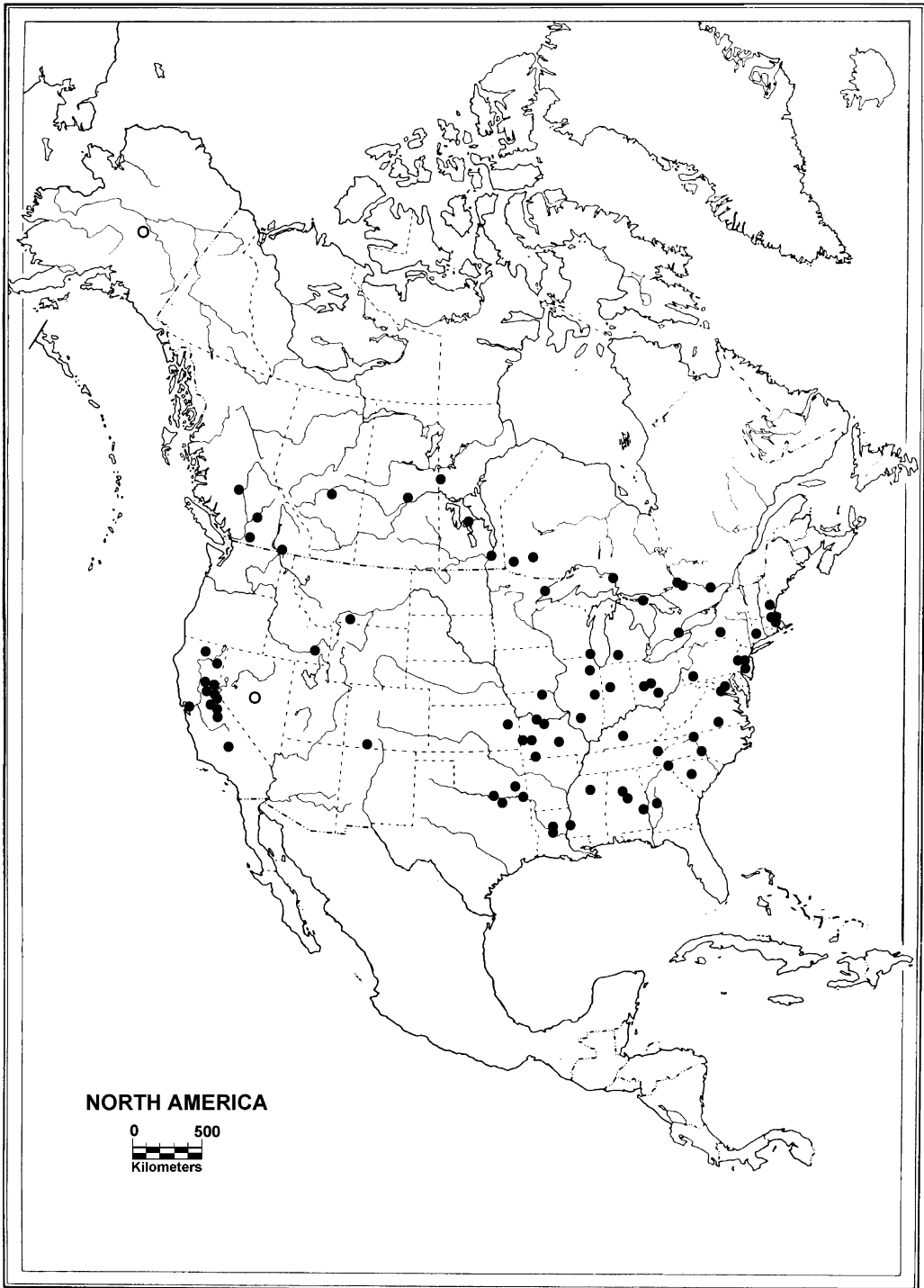


Fig. 379. Geographic distribution of *Agathidium exiguum* (○ = state record only).

red]/exigu-um. M. Pa. [handwritten, brown line around label and above "Pa"]/Agat. exiguum Mels. [handwritten]/LECTOTYPE *Agathidium exiguum* Melsheimer, des. Miller and Wheeler, 2003 [red label with black line border]". Melsheimer did not indicate the number of specimens he had when he described the species, so we have selected the specimen in MCZC as the lectotype.

Agathidium ruficorne: lectotype (designated here to clarify association of this name with this species), ♀ in MCZC labeled "[circular light blue disc]/Type 3119 [number handwritten, two-thirds of label red]/A. exiguum Mels. ruficorne Lec. [handwritten]/exiguum 2 [handwritten]". LeConte did not indicate the number of specimens he had when he described the species. There is one specimen in the MCZC with the light blue disc that LeConte used to indicate specimens from Lake Superior. We selected this specimen as the lectotype.

Agathidium californicum: lectotype (designated here to clarify association of this name with this species), ♂ in MCZC labeled "Cal/♂/LectoTYPE 3022 [number handwritten, red label]/A. californicum Horn. [handwritten]". Horn had several specimens when he described the species, but it is not clear how many or which ones they are. A single specimen in MCZC labeled as the type is selected as the lectotype.

Agathidium alutaceum: holotype, ♀ in MCZC labeled "Alask./♀/TYPE alutaceum [name handwritten, red line under "TYPE"]/M.C.Z. Type 24027 [number handwritten, red label]/H.C. FALL COLLECTION/*Agathidium alutaceum* Fall [handwritten, red line around border]".

TYPE LOCALITY: *Agathidium exiguum*: United States, Pennsylvania.

Agathidium ruficorne: "Lake Superior area".

Agathidium californicum: United States, California [here restricted].

Agathidium alutaceum: United States, Alaska.

DIAGNOSIS: This species is distinguishable from most species by the large, well-developed eyes, the prominent sutural stria extending nearly two-thirds the length of the elytron (in most specimens), the moderately broad metasternum beset with setae and rel-

atively large metasternal fovea, the small metafemoral tooth (fig. 171), and the characteristic male genitalia (figs. 351–353). The species is extremely similar to *A. fawcettae* and the two co-occur throughout a large portion of eastern North America (figs. 379, 380). Unfortunately, the only characters found for separating the two species are in the median lobe. That of *A. exiguum* has the apical portion in lateral aspect slender, curved, and apically abruptly expanded with a rather prominent subapical expansion or tooth on the dorsal margin (fig. 352), whereas in *A. fawcettae* the apical portion is broader, apically straight, and without the prominent expansion apically (fig. 355).

DESCRIPTION: Body moderately large (TBL = 2.21–2.80 mm), broad, robust (PNW/TBL = 0.46–0.53), rounded, strongly contractile.

Head and pronotum dark red; elytra red to dark red, not iridescent; venter red to red-brown; antennae and palpi red-yellow; legs yellow to yellow-red.

Head broad (MDL/OHW = 0.57–0.65), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, microreticulate on many specimens, consisting of fine, isodiametric cells; frontoclypeal suture obsolete medially; eyes prominent, large, protruding, not reduced; gula concave; antennomere ratios: length I: II:III = 2.2:1.0:2.0, width VII:VIII:IX = 1.0:1.0:2.0. Pronotum very large, broad (PNL/PNW = 0.67–0.79), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, lightly microreticulate. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.99–1.04); punctuation and surface similar to pronotum; sutural stria extending from apex to nearly two-thirds length of elytron. Flight wings well developed. Mesosternum broad, not declivitous; medial carina moderately developed. Metasternum moderately broad (MTL/MTW = 0.15–0.19), medially flat, gently sloping dorsad anteriorly; oblique femoral carinae well developed, but not prominent where they meet medially on metasternum.

Male tarsi 5-5-4; pro- and mesobasotar-

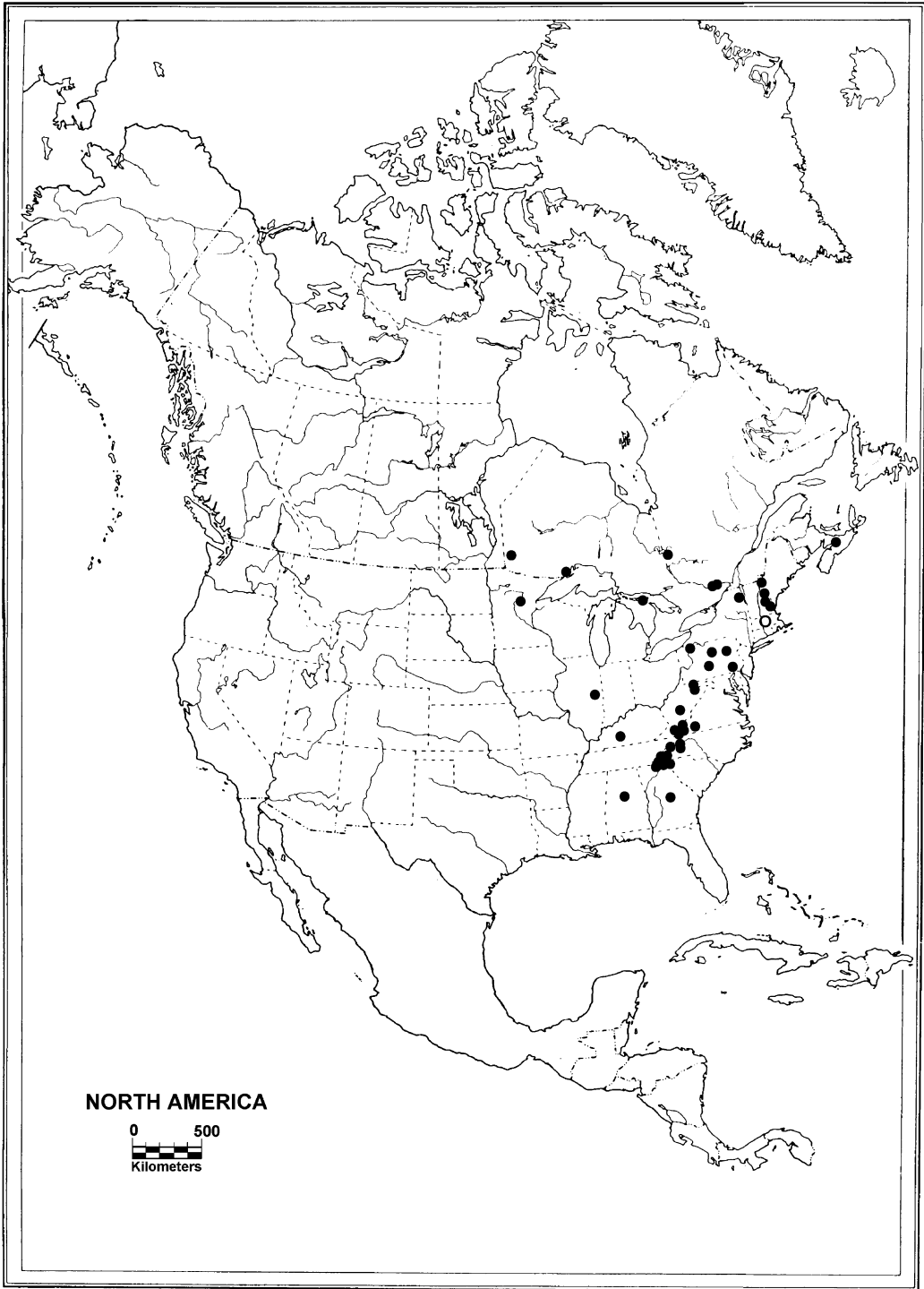


Fig. 380. Geographic distribution of *Agathidium fawcettae*.

someres slightly laterally expanded, with moderately large field of ventral spatulate setae; mandibles not modified; metafemur moderately broad, with small, subapical tooth on posterior margin, apical margin irregularly sinuate (fig. 171); metasternal fovea large, transversely ovoid, with large brush of fine, dense, long seta. Median lobe in lateral aspect slender, bent basally, gently curved thereafter, apical portion flexed dorsally, slender, short, apex distinctly expanded on dorsal margin, expansion obtusely pointed (fig. 352); in ventral aspect slender, lateral margins parallel, apical portion evenly narrowed to rounded apex (fig. 351); operculum flat, short, robust, broad basally, gradually narrowed to broadly rounded apex (fig. 251); lateral lobes very slender throughout length, long, nearly straight, very slightly expanded apically, with 2 stout, subapical setae (fig. 253).

Female tarsi 5-4-4.

DISTRIBUTION: This species is very widespread throughout North America (fig. 379). Matthews (1887) reported this species (as *A. californicum*) from Guatemala, but this record most likely refers to a different species.

SPECIMENS EXAMINED: "W.T." [probably Washington Territory] (1, MCZC).

CANADA: *Alberta:* George lake, 50 km NW Edmonton, 11 Jun 1984, spruce-aspen forest, FIT, S and J Peck (1, CNCI); Tp40Rg10 W 3 mer9, 20 May 1962, BF and JL Carr (1, CARR). *British Columbia:* Salmo, 9 Jun 1968, Campbell, Smetana (1, QDWC); Salmon Arm, 22 Sep 1930, H Leech (1, CASC); Princeton, S Wash Creek, 22 Jul 1983, Lindgren funnel trap (1, MTEC); Lac la Hache, 12 Jul 1969, under bark, BF and JL Carr (5, CARR); Salmon Arm, 30 Sep 1922 (1, MCZC). *Manitoba:* Devils Lake, 100 km S Grand Rapids, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (1, PECK); Grass River Prov. Park 100 rd km SE FlinFlon, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (6, CNCI); Rennie, Lily Point, Whiteshell Prov. Park, 6 Jun 1984, maple-poplar forest, FIT, S and J Peck (2, PECK); Grass River Prov. Park 100 rd km SE FlinFlon, 7 Jun 1984, pine-aspen forest, FIT, S and J Peck (2, PECK). *Ontario:* Hamilton, 28 Jun 1982, M Sanborne (4, CNCI); 25 km W Ignace, 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (2, CNCI); Kenora District 17.3 mi S Sioux Narrows, 20 Jun 1975, L and N Herman (2, AMNH); Algonquin Prov. Park nr Brent, Nipissing Co., 19 Aug 1980, R Baranowski (3, LUND); Lake Su-

perior Prov. Park, Algoma Co., 9 Sep 1980, R Baranowski (7, LUND); Alfred, Alfred Bog, 10 Jun 1984, M Sanborne (3, PECK); Manitoulin I. 2 mi S Maple Pt, 1 Jun 1982, Malaise, A Ritchie (2, CNCI); 25 km W Ignace 75 km E Dryden, 5 Jun 1984, fir-maple forest, FIT, S and J Peck (5, PECK); Mattawa Champlain Prov. Park, 2 Jun 1984, mixed whitepine forest, evening car netting, S and J Peck (1, PECK); Pr. Ed. Co., 5 Jun 1954, decaying maple, JF Brimley (2, CNCI). *Saskatchewan:* Jay Jay Lake, Rt 102 130 km NE Candle Lake, 8 Jun 1984, pine-fir forest, FIT, S and J Peck (1, PECK).

UNITED STATES: *Alabama:* Opelika, 24 Mar 1974, EJ Kiteley (2, CNCI); Jefferson Co.: Rocky Ridge nr Little Shades Creek, 30 Dec 1978, litter, T King (1, CNCI); Shelby Co.: 21 Sep 1981, light trap, T King (1, CNCI). *Arkansas:* Columbia Co.: 2 mi NE Magnolia, 1 Apr 1993, hardwood, C Carlton (1, LSAM); Conway Co.: Pet Jean Mtn NW Slope Hwy 155, 16 Apr 1988, C Carlton (1, LSAM); Faulkner Co.: 10 mi E Conway at Field Trail Area, 20 Mar 1991, bottomland, Berlese, C Carlton (3, LSAM); Jefferson Co.: 1.3 mi S Interstate Hwys 88 and 79, 11 Mar 1977, bottomland, Berlese, H Chenowith (1, LSAM); Montgomery Co.: Little Mo. Falls Rec. Area, Slopes SW River, 15 Nov 1991, deciduous forest, C Carlton (3, LSAM); Polk Co.: Caney Creek Wildlife Area, 3.5 mi N Bard Springs, 5 Jul 1991, maple, beech forest, Berlese, C Carlton (3, LSAM); Sharp Co.: Cherokee Village, 26 Jun 1972, river bank litter, W Suter (1, AMNH). *California:* state only (5, MCZC); Lake Tahoe, 17 Jul 1917 (1, MCZC); Yosemite (1, EMEC); Davis Meadow, R.R. Flat, 8 Aug, FE Blaisdell (13, CASC); Alameda Co.: Berkeley, 27 May 1950 (1, EMEC); Alpine Co.: 14 Aug 1909, FE Blaisdell (2, CASC); Butte Co.: Feather Falls, 16 May 1971, DS Chandler (4, CASC); Calaveras Co.: Mokel Hill, 14 Aug 1909, FE Blaisdell (1, CASC); Big Trees, Aug (1, CASC); Lassen Co.: Facht, 5 Jun 1922, JO Martin (21, CASC); Sierra Co.: Snag Lake, 20 Jul 1983, 6700', at lake margin, A Hardy, F Andrews (1, FGAC); Siskiyou Co.: Sisona, Jul (1, CASC); Tulare Co.: Sequoia Natl For., Quaking Aspen, 28 May 1979, on shelf fungus, T Eichlin (1, FGAC); Tuolumne Co.: 1 mi SW Pine Grove, 13 Apr 1975, under bark of *Pinus ponderosa*, FG Andrews (2, FGAC); Yuba Co.: Sierra Foothill Field Sta. 5 mi N Smartville, 4 May 1980, 1300-1500', JK Liebherr (3, EMEC); 1 mi W Strawberry Ranger Sta., 6 Jun 1980, 3600', JK Liebherr (2, EMEC). *Colorado:* Hinsdale Co.: Indian Head, 18 mi NW Pagosa Springs, 16 Aug 1977, under bark, dead *Pinus ponderosa*, FG Andrews (8, FGAC). *Connecticut:* Cornwall, 11 Jun 1970, Chamberlain (3, CNCI). *District of Colum-*

bia: Roosevelt Island, 25 Jul 1987 (1, QDWC). *Georgia*: Macon Co.: Ocmulgee N. Mon., 8 Jun 1981, pine-mixed forest, FIT, S Peck (4, CNCI). *Idaho*: Bannock Co.: Scout Mtn, 19 Jun 1975, AD Allen (1, PECK). *Illinois*: Palos Park, 26 May 1946, HS Dubas (1, FMNH); Mahomet, Nettie Hart Memoria Woods, 18 Sep 1984, MW Sanderson (7, CNCI); Champaign Co.: Mahomet, Hart Woods, 20 May 1979, oak woods, malaise FIT, S and J Peck (1, PECK); DuPage Co.: Argonne Natl Lab., 24 Jul 1967, oak litter, W Suter (1, PECK); Argonne Natl Lab., 24 Jul 1967, oak log, W Suter (1, FMNH); Washington Co.: 2 mi E Beaucoup, 9 Jun 1969, RL Westcott (1, RLWE). *Indiana*: Lafayette, 6 May 1964, EJ Kiteley (19, CNCI). *Kansas*: Douglas Co.: Breidenthal Res. 2 mi N Baldwin, 16 May 1984, window trap, J Pakaluk (2, QDWC); Breidenthal Res., 2 mi N Baldwin, 16 May 1984, window trap, J Pakaluk (4, AMNH). *Kentucky*: Edmonson Co.: Mammoth Cave NP, 15 May 1983, mesic forest, FIT, S and J Peck (1, PECK). *Louisiana*: Stuart Natl For. 3 km SW Pollock, 13 May 1985, FIT, H and A Howden, C. Scholtz (1, CNCI); Grant Co.: 18 km N Alexandria Stuart Lake Camp, 19 May 1983, forest, FIT, S and J Peck (1, PECK). *Maryland*: Takoma Park, 30 May 1943 (1, CASC). *Massachusetts*: Tyngsboro (1, CMNH); Tyngsboro, May 1902, EC Van Dyke (1, CASC); Low (1, CMNH); Middlesex Co.: Medford, 11 May 1971, under bark, A Newton (1, CNCI). *Michigan*: Kalamazoo Co.: Hickory Corners, Gull lake, 11 Jun 1981, FIT, R Anderson (3, CNCI). *Minnesota*: Beaver Bay, 12 Aug 1952, EJ Kiteley (5, CNCI). *Mississippi*: Claiborne Co.: 19 km NEP+ Gibson Owens Creek, mi 152, 18 May 1983, forest, FIT, S and J Peck (2, PECK); 19 km NEP+, Gibson Owens Creek, mi 52, 18 May 1983, forest, FIT, S and J Peck (1, PECK); Pontotoc Co.: 32 km SW Tupelo Tockshish, 17 May 1983, oak forest, FIT, S and J Peck (3, PECK). *Montana*: Redcliff Camp, 17 Jul 1968, BF and JL Carr (1, CARR). *Nevada*: state only (1, MCZC). *New Hampshire*: Straf. Co.: 1 mi SW Durham, 2 Jul 1987, FIT, DS Chandler (14, CNCI); Spruce Hole, 3 mi SW Durham, 12 May 1987, FIT, DS Chandler (17, CNCI). *New Jersey*: Medford, 26 May 1929 (2, CASC); Burlington Co.: Folly Camp nr Gretna, 12 May 1981, M Kaulbars (3, CNCI). *New York*: Bear Mtn, 1 Sep 1946, JG Rosen (1, EMEC); Tompkins Co.: Ringwood, Dryden, 13 Jul 1955, CA Triplehorn (1, CASC). *North Carolina*: Montgomery Co.: Uwharrie, 5 Oct 1985, R Baranowski (1, LUND); Surry Co.: Pilot Mt. St Park, 6 Oct 1985, R Baranowski (3, LUND). *Ohio*: Delaware Co.: 15 Aug, DJ and JD Knull (1, CASC); Hocking Co.: 18 Oct, DJ Knull (1, CASC); Logan Co.: 3 mi NW Mingo, 4 Aug 1972, QD Wheeler (1,

QDWC); 3 mi NW Mingo, 4 Aug 1976, QD Wheeler (1, QDWC). *Oklahoma*: Latimer Co.: Oct 1983, K Stephan (19, QDWC); 2 mi E Gown, 2 Jul 1987, wood rat nest, K Stephan and D Chandler (5, CNCI); 25 Feb 1985, litter, grass, FIT, K Stephan (1, KSIC); Gaines Creek, 3 mi SW Damon, 4 Jul 1987, forest litter, K Stephan and D Chandler (6, CNCI); 3 mi S Wilberion, 2 Jul 1987, forest litter, K Stephan and D Chandler (2, CNCI); 5 mi W Red Oak, Dec 1980, K Stephan (5, QDWC); Marshall Co.: Univ. Oklahoma Biol. Sta. on Lake Texoma (Willis), 14 Apr 1968, cottonwood log litter, W Suter (1, PECK); McCurtain Co.: Beaver Bend St. Park, 31 Jul 1968, log litter, W Suter (2, PECK). *Pennsylvania*: Easton, 9 Oct 1915, JW Green (1, CASC); Jeannette, 20 Aug, HG Klages (2, CMNH). *South Carolina*: Columbia, 23 Mar 1946, CL Cartwright (2, JRAC); Oconee Co.: 12 mi NW Walhalla, Oconee St. Park, 3 Jun 1981, 1700', FIT, S Peck (1, PECK). *Tennessee*: Sevier Co.: Greebrier Cove, Ramsey Cascade Trail, 19 May 1972, 3900', under bark of dead *Aesculus*, A Newton (2, FMNH). *Texas*: Grayson Co.: Juniper Point, 27 Jun 1969, log litter, W Suter (1, CNCI). *Virginia*: Mecklin Co.: 7 mi NE Chase City, 10 Aug 1975, Chandler (1, CNCI). *Wisconsin*: Kenosha Co.: Somers (3 mi W) County Line Forest, 19 Oct 1968, oak log, W Suter (1, PECK).

DISCUSSION: Our examination of the types of *A. exiguum*, *A. ruficorne*, *A. californicum*, and *A. alutaceum* have led us to conclude that these names refer to the same species. *Agathidium alutaceum* is somewhat out of the range of more recently collected specimens of this species and it is a female, suggesting the possibility that it is a different species. However, the specimen agrees in all external characters with other western specimens of *A. exiguum* (including dorsal microreticulation).

This species has been collected during every month. It has been found in many forest habitats, especially from leaf and log litter. There is a record from a "wood rat nest". Elevation records are from 1300 to 6700 ft. A single host record is "shelf fungus".

Agathidium fawcettae Miller and Wheeler,
new species

Figures 172, 354–356, 380

TYPE MATERIAL: Holotype, ♂ in AMNH labeled "NC: Macon Co., Highlands VIII Q.D.Wheeler Lot #8 4021/HOLOTYP

Agathidium fawcettae Miller and Wheeler, 2003 [red label with black line border]”.

TYPE LOCALITY: United States, North Carolina, Macon Co., Highlands.

DIAGNOSIS: This species is distinguishable from most species by the large, well-developed eyes, the prominent sutural stria extending nearly two-thirds the length of the elytron (in most specimens), the moderately broad metasternum beset with setae and relatively large metasternal fovea, the small metafemoral tooth (fig. 172), and the characteristic male genitalia (figs. 354–356). This species is exceptionally similar to *A. exiguum*. See the diagnosis under that species for characters to separate the two.

DESCRIPTION: Body small to moderately large (TBL = 1.95–2.66 mm), broad, robust (PNW/TBL = 0.46–0.55), rounded, strongly contractile.

Head and pronotum dark red; elytra red to dark red, not iridescent; venter red to red-brown; antennae and palpi red-yellow; legs yellow to yellow-red.

Head broad (MDL/OHW = 0.59–0.60), dorsal surface flattened, dorsoventrally compressed; with very fine punctures, each with a short, very fine seta, surface between punctures shiny, lightly microreticulate, consisting of fine, isodiametric cells; frontoclypeal suture obsolete medially; eyes prominent, protruding, not reduced; gula concave; antennomere ratios: length I:II:III = 1.6:1.0:1.9, width VII:VIII:IX = 1.0:1.0:1.9. Pronotum very large, broad (PNL/PNW = 0.68), strongly convex, anterolateral lobes strongly produced, lateral margin broadly curved, not angulate; with very fine, sparse punctures, each with a short, very fine seta, surface between punctures shiny, lightly microreticulate. Elytra broad, lateral margins strongly rounded, apically rounded (SEL/ELW = 0.78–1.07); punctation and surface similar to pronotum; sutural stria extending from apex to nearly two-thirds length of elytron. Flight wings well developed. Mesosternum broad, not declivitous; medial carina moderately developed. Metasternum relatively slender (MTL/MTW = 0.15–0.17), medially flat, gently sloping dorsad anteriorly; oblique femoral carinae well developed, but not prominent medially on metasternum.

Male tarsi 5-5-4; pro- and mesobasotar-

someres somewhat laterally expanded, with small ventral field of spatulate setae; mandibles not modified; metafemur moderately broad, with small, subapical tooth on posterior margin, apical margin irregularly sinuate (fig. 172); metasternal fovea large, transversely ovoid, with large brush of fine, dense, long seta. Median lobe in lateral aspect slender, bent basally, gently curved thereafter, apical portion long and thick in lateral aspect, not distinctly expanded apically (fig. 355); in ventral aspect slender, lateral margins parallel, apical portion slightly constricted medially, apex broadly rounded (fig. 354); operculum flat, short, robust, broad basally, gradually narrowed to broadly rounded apex (fig. 354); lateral lobes very slender throughout length, long, nearly straight, very slightly expanded apically, with 2 stout, subapical setae (fig. 356).

Female tarsi 5-4-4.

ETYMOLOGY: Named in honor of scientific illustrator Frances Fawcett for her superb contributions to this study of *Agathidium* and her encouragement over many years.

DISTRIBUTION: This species is widespread in eastern North America (fig. 380).

PARATYPES: CANADA: *Nova Scotia*: Portau-pique, 25 Aug 1929, CA Frost (1, CNCI). *Ontario*: Black Sturg. Lake, 1 Aug 1956, Lindberg (1, CNCI); Manitoulin I. 2 mi S Maple Pt, 23 May 1982, FIT, A Ritchie (1, CNCI); Constance Bay, 12 Jun 1978, M Sanborne (1, CNCI); Thunder Bay, Powell Lakes, 24 May 1980, mixed birch-poplar-pine, FIT, M Kaulbass (1, PECK); Alfred Bog, Alfred, 10 Jun 1984, M Sanborne (4, CNCI). *Quebec*: Hull, 29 Jul 1984, BRI staff (1, CNCI); Duparquet, 3 Jun 1939, “lake shore wash up”, GS Smith (3, CASC); Hull, Gatineau Park nr Pinks Lake, 23 Jun 1979, malaise, S Peck, A Davies (1, CNCI); Hull Gatineau Park. nr Pinks Lake, 23 May 1979, malaise, S Peck, A Davies (2, PECK).

UNITED STATES: *Alabama*: Jeff Co.: Hoover, 9 Sep 1982, U.V., T King (4, CNCI). *Georgia*: Rabun Co.: Satolah, 29 May 1983, *Rhododendron* mixed leaf litter, DS Chandler (2, DENH); Wilkinson Co.: Big Sandy Creek 8 mi S Irvinton, US 441, 5 Jun 1984, FIT, SA Marshall (1, PECK). *Illinois*: Champaign Co.: Mahomet, Hart Woods, 20 May 1979, oak woods, malaise, S and J Peck (7, CNCI). *Kentucky*: Edmonson Co.: Mammoth Cave NP, 15 May 1981, mesic forest, FIT, S and J Peck (1, PECK); Mammoth Cave NP, 15 May 1983, mesic forest, FIT, S and J Peck (2, PECK).

Massachusetts: state only (1, CMNH). *Minnesota*: Brainerd, 21 Jun 1951, EJ Kiteley (5, CNCI). *New Hampshire*: Belk Co.: Lower Gilmanton, 23 Apr 1982, leaf litter, Berlese, SL Radke (1, DENH); Carr. Co.: 1 mi N Wonalancet, 7 Aug 1985, FIT, DS Chandler (36, CNCI); Coos Co.: Norton Pool, 3 mi NE East Inlet Dam, 26 May 1986, conifer logs, DS Chandler (1, CNCI); Norton Pool, 2 mi E East Inlet Dam, 7 Sep 1984, rotten spruce/fir logs, DS Chandler (18, CNCI); Norton Pool, 3 mi NE East Inlet Dam, 9 Jul 1986, conifer logs, DS Chandler (1, CNCI); Strafford Co.: 1 mi SW Durham, 2 Jul 1987, DS Chandler (1, CNCI); Spruce Hole 3 mi SW Durham, 27 May 1987, FIT, DS Chandler (2, CNCI); Spruce Hole 3 mi SW Durham, 26 May 1987, under oak bark, DS Chandler (1, CNCI); Strafford Co.: 1 mi SW Durham, 27 Apr 1987, DS Chandler (2, CNCI); Spruce Hole, 3 mi SW Durham, 12 Jun 1982, fir litter, Berlese, DS Chandler (4, DENH); 4 mi W Durham, 18 Jun 1982, window trap, RM Reeves (10, DENH). *New York*: Up Saranac, 11 Jul 1928, JW Green (1, CASC). *North Carolina*: Valley of Black Mts, 10 Sep 1906, W Beutenmuller (1, AMNH); Black Mts, 2 Jul (1, CASC); Black Mts (1, CASC); Avery Co.: Linville Falls Blue Ridge Parkway mi 317, 2 Jun 1981, 3500', FIT, S Peck (3, CNCI); Buncombe Co.: Great Craggy Mts, Blue Ridge Parkway mi 371, 2 Jun 1981, FIT, S Peck (14, CNCI); Great Craggy Mts Blue Ridge Parkway mi 371, 2 Jun 1981, 4000', FIT, S Peck (1, PECK); Caldwell Co.: 7 Jun 1985, W Peckard (1, CNCI); Haywood Co.: Balsam Mt Blue Ridge Parkway mi 439, 3 Jun 1981, 4400', FIT, S Peck (1, CNCI); Jackson Co.: Blue Ridge Parkway Bear Paw Gap mi 29, 5 Jul 1984, FIT, SA Marshall (1, PECK); Macon Co.: Highlands, 9 Jun 1981, QD Wheeler (1, QDWC); 1.5 mi NW Highlands, 2 Jul 1983, 3000', mixed vegetation, J Pakaluk (1, AMNH); Highlands, 4 Jun 1981, QD Wheeler (5, QDWC); Highlands, 4 Jun 1981, QD Wheeler (2, QDWC); 3 mi NW Highlands, 29 May 1983, rotten wood, DS Chandler (1, DENH); Highlands, Aug, QD Wheeler (2, QDWC); 3 mi NW Highlands, 14 Aug 1981, on *Fuligo Septica*, QD Wheeler (1, QDWC). *Pennsylvania*: Allegheny (1, CMNH); Clinton Co.: Bald Eagle Mountain 2 mi W Lamar, 23 Dec 1975, QD Wheeler (1, QDWC); Hunt Co.: Rothrock St. Forest Seeger Nat. Area, 30 May 1985, mixed leaf litter, DS Chandler (1, CNCI); Luzerne Co.: Nuangola, 12 May 1985, forest, FIT, S Peck (2, PECK); Warren Co.: Allegheny Natl For. Hearts Content Scenic Area, 29 May 1985, pine leaf litter, DS Chandler (1, CNCI). *South Carolina*: Oconee Co.: 12 mi NW Walhalla Oconee St. Park, 3 Jun 1981, FIT, S Peck (1, PECK); 12 mi NW Walhalla Oconee St. Park, 3 Jun 1981, 1700', FIT, S Peck (7, CNCI). *Virginia*: Franklin

Co.: Blue Ridge Parkway mi 154, Smart View, 31 Aug 1981, 2560', FIT, S Peck (7, CNCI); Giles Co.: White Rocks, 13 Oct 1985, R Baranowski (1, LUND); 6 Oct 1984, 4100', on *Hemitrichia clavata*, SL Stephenson (2, CUIC); Grayson Co.: 7 Jul 1983, 5700', on *Badhamia* sp., SL Stephenson (1, CUIC); Pulaski Co.: 7 mi SE Mechanicsburg, 9 Oct 1985, R Baranowski (1, LUND); Tazewell Co.: 5 mi N Broadford, 12 Oct 1985, R Baranowski (1, LUND). *West Virginia*: Nicholas Co.: 8.2 km NE Richwood, 12 May 1986, A Smetana (2, CNCI); Preston Co.: 21 Sep 1984, 2600', on *Physarum viride*, SL Stephenson (1, CUIC); Tucker Co.: 23 Sep 1984, 3200', on *Leocarpus fragilis*, SL Stephenson (1, CUIC).

DISCUSSION: This species is extremely similar to *A. exiguum*. However, the consistent differences in the shape of the apex of the median lobe indicate that two species should be recognized.

This species has been collected nearly every month. It occurs in various conifer and deciduous forest types and has been collected from a wide variety of litter types. Elevation records are from 1700 to 5700 ft. Host records include *Fuligo septica*, *Physarum viride*, *Leocarpus fragilis*, *Hemitrichia clavata*, and *Badhamia* sp.

Species of Uncertain Status

A. difficile Matthews

Agathidium difficile Matthews, 1887: 76.

TYPE MATERIAL: Lectotype (designated here to clarify assignment of this name to this species), ♀ in BMNH labeled "Type [circular label with red line around edge]/Cerro de Plumas, Mexico. Hoege./*Agathidium difficile* [handwritten, yellow label with black line along bottom]/B.C.A., Col., II, I". Matthews did not indicate the number of specimens on which he based this description. The single specimen we examined (BMNH) is therefore designated as the lectotype.

TYPE LOCALITY: Mexico, state of Mexico, Cerro de Plumas.

DISCUSSION: This species was not included in Fall's (1934b) revision. The lectotype is a female glued to a card. Many of the appendages (legs and antennae) are broken but are glued to the card as well. Because the specimen is a female it is impossible at this time to confidently assign other specimens to this

species or to exclusively diagnose the species. It is clearly a member of the *A. oniscoides* group and the *A. aztec* subgroup. The eyes are relatively large and multifaceted and $TBL = 2.3$. The specimen is nearly black, not iridescent, and is very typical of members of this group of species. Matthews (1887) pointed out that specimens have a longitudinal impressed line immediately adjacent to the suture in addition to a sutural stria. However, most *A. aztec* subgroup species have a similar impressed line and a sutural stria. We did not remove the apparently very fragile specimen from the card or otherwise seek to examine the ventral surface for possible distinguishing features. Instead, we chose to leave the specimen for a future researcher to examine with improved technology and knowledge of *Agathidium oniscoides* group females.

Agathidium mexicanum Hendrichs

Agathidium mexicanum Hendrichs, 1979: 106.

TYPE MATERIAL: Holotype not examined.

TYPE LOCALITY: Mexico, state of Mexico, Cerro Tlaloc, 3800 m.

DISCUSSION: The holotype of this species is not in either Universidad Nacional Autónoma de México (UNAM) or the Museo de Historia Natural de la Ciudad de México (S. Santiago, personal commun.), although Hendrichs (1979) indicated that the specimens were deposited in the latter museum, and much of his material is in UNAM (S. Santiago, personal commun.). The species is clearly in the *A. aztec* subgroup of the *A. oniscoides* group based on the shape of the median lobe, which has lateral sulci and carinae, and the strongly sinuate lateral lobes. However, Hendrichs' description is not detailed enough, nor are his illustrations adequate to differentiate *A. mexicanum* from the many other species of *Agathidium* in Mexico that are distributed near the type locality.

CHECKLIST OF AGATHIDIUM SPECIES OF NORTH AND CENTRAL AMERICA

Agathidium sexstriatum species group

- A. bistriatum* Horn, 1880
- A. estriatum* Horn, 1880
- A. sexstriatum* Horn, 1880

Agathidium brevisternum species group

- A. brevisternum* Fall, 1934b
- A. dioperculum* Wheeler and Miller, 2005
- A. rhinocerellum* Wheeler and Miller, 2005

Agathidium revolvens species group

- A. angustoperculum* Wheeler and Miller, 2005
- A. cavisternum* Fall, 1934b
- A. conjunctum* Brown, 1933
= *A. obtusum* Hatch, 1957
- A. depressum* Fall, 1934b
- A. dubitanoides* Wheeler and Miller, 2005
- A. dubitans* Fall, 1934b
- A. falcatooperculum* Wheeler and Miller, 2005
- A. jasperanum* Fall, 1934b
- A. revolvens* LeConte, 1850
- A. omissum* Fall, 1934b
- A. virile* Fall, 1934b
= *A. hebetatum* Hatch, 1957

Agathidium concinnum species group

- A. akallebregma* Miller and Wheeler, **new species**
- A. angulare* Mannerheim, 1852
= *A. assimile* Fall, 1934b, **new synonym**
- = *A. temporale* Fall, 1934b (preoccupied by Sahlberg, 1908, replaced by Hatch, 1957)
- = *A. municeps* Fall, 1934a (replacement name for *A. temporale* Fall, 1934b *nec* Sahlberg, 1908), **new synonym**
- = *A. falli* Hatch, 1957 (unnecessary replacement name for *A. temporale* Fall, 1934b *nec* Sahlberg, 1908), **new synonym**
- A. concinnum* Mannerheim, 1852
= *A. effluens* Mannerheim, 1853
- A. hatchi* Wheeler, 1977 (replacement name for *A. fenderi* (Hatch, 1957) *nec* Hatch, 1957)
= *A. hatchi* (Hatch, 1957) (preoccupied by Hatch, 1957, replaced by Wheeler, 1977)

A. mollinum Fall, 1934b

Agathidium pulchrum species group

- A. amae* Miller and Wheeler, **new species**
- A. aristerium* Wheeler, 1987
- A. athabascanum* Fall, 1934b
= *A. alticola* Fall, 1934b. **New synonym**
- A. atronitens* Fall, 1934b

- A. columbianum* Fall, 1934b
A. difforme (LeConte, 1850)
 = *A. canadense* Brown, 1930
A. hamulum Miller and Wheeler, **new species**
A. laetum Fall, 1934b
A. maculosum Brown, 1928
 = *A. franciscanum* Fall, 1934b
A. marae Miller and Wheeler, **new species**
A. oregonense Miller and Wheeler, **new species**
A. picipes Fall, 1934b
 = *A. contiguum* Fall, 1934b, **new synonym**
 = *A. varipunctatum* Hatch, 1936, **new synonym**
 = *A. striolum* Hatch, 1957, **new synonym**
A. politum LeConte, 1866
A. pulchrum LeConte, 1853
 = *A. mandibulatum* Mannerheim, 1853
A. repentinum Horn, 1880
A. rotundulum Mannerheim, 1852
 = *A. kincaidi* Hatch, 1936
A. rusticum Fall, 1934b
Agathidium compressidens species group
A. compressidens Fall, 1934b
A. fenderi Hatch, 1957
A. vesperpressidens Miller and Wheeler, **new species**
Agathidium iota species group
A. iota Miller and Wheeler, **new species**
Agathidium oniscoides species group
Agathidium kimberlae subgroup
A. kimberlae Miller and Wheeler, **new species**
A. vaderi Miller and Wheeler, **new species**
Agathidium aztec subgroup
A. andersoni Miller and Wheeler, **new species**
A. aztec Miller and Wheeler, **new species**
A. bituberculum Miller and Wheeler, **new species**
A. cortezi Miller and Wheeler, **new species**
A. difficile Matthews, 1887
A. disgregum Miller and Wheeler, **new species**
A. erythromelas Miller and Wheeler, **new species**
A. gomezae Miller and Wheeler, **new species**
A. grandidentatum Miller and Wheeler, **new species**
A. grumum Miller and Wheeler, **new species**
A. hidalgoense Miller and Wheeler, **new species**
A. hirsutum Miller and Wheeler, **new species**
A. hyle Miller and Wheeler, **new species**
A. impensum Miller and Wheeler, **new species**
A. invisitatum Miller and Wheeler, **new species**
A. iridescens Miller and Wheeler, **new species**
A. lobosternum Miller and Wheeler, **new species**
A. megoniscoides Miller and Wheeler, **new species**
A. mexicanum Hendrichs, 1979
A. multidentatum Miller and Wheeler, **new species**
A. rumsfeldi Miller and Wheeler, **new species**
A. oaxacaense Miller and Wheeler, **new species**
A. oculeum Miller and Wheeler, **new species**
A. oedema Miller and Wheeler, **new species**
A. popocatepetlae Miller and Wheeler, **new species**
A. potosii Miller and Wheeler, **new species**
A. recurvatum Miller and Wheeler, **new species**
A. rhamphastes Miller and Wheeler, **new species**
A. sejunctum Miller and Wheeler, **new species**
A. skoliosternum Miller and Wheeler, **new species**
A. stenomma Miller and Wheeler, **new species**
A. tenangoense Miller and Wheeler, **new species**
A. triangularum Miller and Wheeler, **new species**
A. tribulograndum Miller and Wheeler, **new species**
A. tribulosum Miller and Wheeler, **new species**
A. cheneyi Miller and Wheeler, **new species**
A. tumidiventre Miller and Wheeler, **new species**

Agathidium dentigerum subgroup

- A. akrogeneios* Miller and Wheeler, **new species**
A. appalachium Miller and Wheeler, **new species**
A. carolinense Miller and Wheeler, **new species**
A. bushi Miller and Wheeler, **new species**
A. dentigerum Horn, 1880
A. divaricatum Miller and Wheeler, **new species**
A. framea Miller and Wheeler, **new species**
A. gallititillo Miller and Wheeler, **new species**
A. georgiaense Miller and Wheeler, **new species**
A. pocahontasae Miller and Wheeler, **new species**
A. stephani Miller and Wheeler, **new species**

Agathidium microphthalmum subgroup

- A. chauliodoum* Miller and Wheeler, **new species**
A. microphthalmum Miller and Wheeler, **new species**
A. nimbosilva Miller and Wheeler, **new species**

Agathidium oniscoides subgroup

- A. exiguum* Melsheimer, 1844
 = *A. ruficorne* LeConte, 1850
 = *A. californicum* Horn, 1880, **new synonym**
 = *A. alutaceum* Fall, 1934b, **new synonym**
A. fawcettae Miller and Wheeler, **new species**
A. oniscoides Palisot de Beauvois, 1817
 = *A. globatile* LeConte, 1878
 = *A. piceum* Melsheimer, 1844
A. rubellum Fall, 1934b

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