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Revisions of Nearctic Tersilochinae III. Genera *Aneuclis* Förster and *Diaparsis* Förster

(Hymenoptera, Ichneumonidae)

Klaus Horstmann

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Sixteen Nearctic species of the genera *Aneuclis* Förster and *Diaparsis* Förster are revised and described. Twelve species are described as new: *Aneuclis interstitialis*, *A. obscura*, *A. petiolaris*, *A. rufula*, *Diaparsis brevicauda*, *D. crassa*, *D. flavipes*, *D. nigrella*, *D. opaca*, *D. punctata*, *D. splendens* and *D. striata*.

Klaus Horstmann, Lehrstuhl Zoologie III, Biozentrum, Am Hubland, 97074 Würzburg, Germany.

Introduction

In a first paper, the original descriptions of the species of Tersilochinae described from the Nearctic region were cited and their types were revised (Horstmann 2001). The genera treated in this third part are closely related: *Aneuclis* Förster probably represents a specialized species group of *Diaparsis* Förster.

The Nearctic species of *Aneuclis* and *Diaparsis* differ by the following characters:

Aneuclis: Intercubitus of front wing subopposite to the 2nd recurrent vein (a rather variable character) (Fig. 4). First brachial cell open at its lower distal corner (but a part of the lower section of the postnervulus present) (Fig. 5). Petiole almost circular in cross-section, smooth, without glymmae or longitudinal carinae or striae (Fig. 7).

Diaparsis: Intercubitus of front wing distinctly basad of the 2nd recurrent vein (Fig. 40). First brachial cell closed at its lower distal corner (but the postnervulus interrupted by a bulla) (Fig. 41) (exception: some specimens of *D. crassa*). Petiole with glymmae and/or longitudinal carinae or striae (Figs 43, 52, 60, 100).

Material and methods

In general terminology follows Townes (1969: 36 ff.). Some additional characters used for the differentiation of species are defined in the second part of the revisions (Horstmann 2010). Two indices are defined: the ocellar index is the ratio of the shortest distance between the eye and the lateral ocellus to the longest diameter of the lateral ocellus; the malar space index is the ratio of the shortest distance between the rim bordering the mandibular groove and the eye (= malar space) to the basal width of a mandible.

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Abbreviations of depositories

AEI	American Entomological Institute, Gainesville (including Dasch collection)
CAM	Museum of Comparative Zoology, Harvard University, Cambridge (Mass.)
FRA	Department of Entomology, California Academy of Sciences, San Francisco
HOR	Coll. K. Horstmann, Würzburg
ITH	Department of Entomology, Cornell University, Ithaca
LAN	Department of Entomology, Michigan State University, East Lansing
NHM	Department of Entomology, Natural History Museum, London
OTT	Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa
WAH	Coll. D. B. Wahl, Gainesville
WAS	Systematic Entomology Laboratory, Smithsonian Institution, Washington (D.C.)

Taxonomy

Aneucelis Förster

Aneucelis Förster, 1869. Type species: *Isurgus rufipes* Szépligeti.

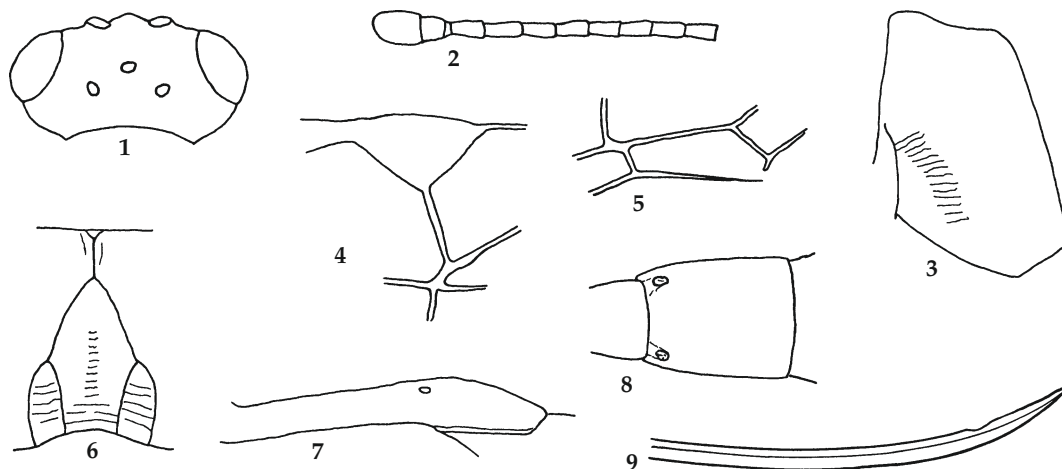
Aneucelis Förster is a medium-sized genus, which was re-described by Horstmann (1971: 59), Townes (1971: 48) and Khalaim (2004: 664 f.). Described species occur in the Palaearctic and the Ethiopian regions (reviewed by Khalaim 2004, 2010). The Nearctic species are undescribed. They belong to a group of closely related species, which also includes the Palaearctic species *Diaparsis denticaudata* Khalaim and *D. minutissima* Khalaim. Because the shape of the postnervulus is intermediate between the two genera, Townes (1971: 49) placed one undescribed Nearctic species of this group (*A. interstitialis*) to *Aneucelis*, whereas Khalaim (2005) described two species (see above) in *Diaparsis*. Because the species are quite different from Nearctic *Diaparsis* species, whereas they are rather similar to European *Aneucelis* species, the species group is here included in *Aneucelis*. *A. denticaudata* (Khalaim) and *A. minutissima* (Khalaim) are new combinations. *Diaparsis hyperae* Kusigemati from Japan is similar to this species group, but differs by a distinctly closed first brachial cell (holotype from the Sapporo museum studied).

The following character states apply to all species discussed here and are not repeated in the descriptions: Head 1.2 times as wide as high. Ratio of the shortest distance between the inner margins of the eyes to the longest distance between the outer contours of the eyes 0.6. Face about as wide as the frons. Clypeus 0.7 times as long as the face. Apex

of clypeus rounded, blunt, with a transverse row of bristles. Genal carina low, oral carina obliterated. Glossa 0.5–0.7 times as long as the width of the clypeus. Thorax short, 1.8–2.0 times as long as the width of the mesoscutum. Epomia obliterated. Prepectal carina low, bent forwards dorsally. Hind tibia distinctly longer than hind femur. Hind basitarsus about half as long as hind tibia. Longer hind tibial spur almost straight distally, about 0.3 times as long as the basitarsus. Hind tarsal claws short, not pectinate. Petiole almost circular in cross-section, smooth, without glymmae, longitudinal carinae or striae (Fig. 7). Gastral tergites of the females incised posteriorly from the 5th tergite onwards. Ovipositor slender, slightly bent upwards proximally and medially, distinctly bent upwards distally, with a shallow rounded dorsal depression subapically, without teeth ventrally (Fig. 9).

Key to Nearctic species

1. Mesopleurum and lateral area of propodeum distinctly or finely punctate on a finely granulate or smooth background. Thorax dark brown or black. 2.
 - Mesopleurum and lateral area of propodeum finely or distinctly granulate, a fine punctation hardly or not at all visible. Thorax yellowish red or light reddish brown. 3.
2. Sublateral area of the face and the frons with fine punctures on a finely granulate background. Mesoscutum with fine dispersed punctures on a smooth background centrally. Ovipositor 3.7–3.9 times, ovipositor sheath 2.8–3.0 times as long as the 1st gastral tergite. *interstitialis* spec. nov. ♀♂
 - Face distinctly granulate sublaterally, frons distinctly granulate, a very fine punctation hardly visible. Mesoscutum with fine punctures on a finely granulate background centrally. Ovipositor 2.9 times, ovipositor sheath 2.1 times as long as the 1st gastral tergite. *obscura* spec. nov. ♀
3. Lateral area of propodeum finely granulate, somewhat shining, with few short wrinkles. Head yellowish red or light reddish brown, as light as the thorax, only the ocellar triangle somewhat darker. Sometimes head tinged with dark brown dorsally. Ovipositor 3.1–3.2 times, ovipositor sheath 2.3–2.5 times as long as the 1st gastral tergite. *petiolaris* spec. nov. ♀♂
 - Lateral area of propodeum distinctly granulate, dull, with long longitudinal wrinkles beside the basal keel. Head dark brown, darker than the



Figs 1–9. *Aneucalis interstitialis* spec. nov. (♀). 1. Head, top view. 2. Base of antenna. 3. Mesopleurum. 4. Pterostigma and areolet. 5. First brachial cell of front wing. 6. Propodeum, top view. 7. 1st gastral segment, side view. 8. 2nd gastral tergite, top view. 9. Ovipositor, side view.

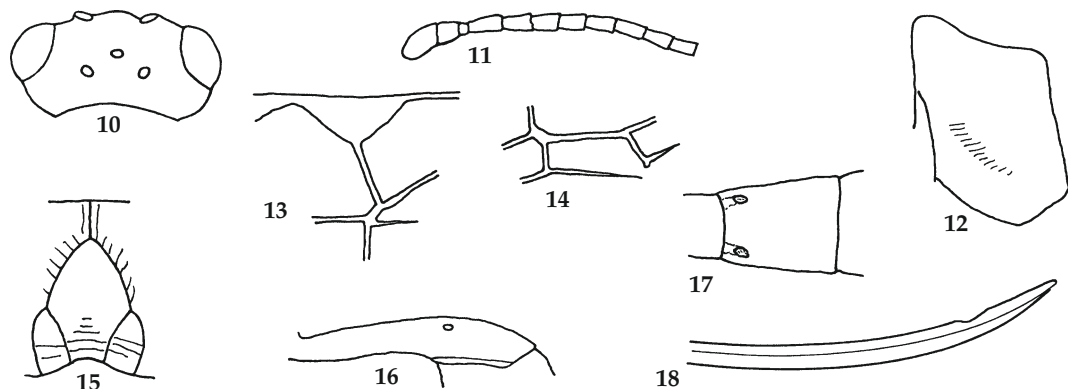
thorax, only the ventral part of the face and the genae paler. Ovipositor 2.3–2.4 times, ovipositor sheath 1.5–1.7 times as long as the 1st gastral tergite. *rufula* spec. nov. ♀

Aneucalis interstitialis spec. nov.

Holotype (♀): "Galena Summit, nr. Stanley, Ida., VIII.5. 78, 8700', H. & M. Townes" (Idaho, USA) (AEI). – **Paratypes** (29 ♀♀, 28 ♂♂): Canada: Alberta: Gilchrist Ranch, Aden (HOR, OTT), Oldman River, Lethbridge (OTT), Onefour (OTT), Scandia (HOR, OTT); British Columbia: Qualicum (OTT); Manitoba: Shilo (OTT); Saskatchewan: Elbow (OTT). USA: Colorado: Boulder, 5500–5800' (OTT), Estes Park, 7500' (OTT); Idaho: Galena Summit near Stanley, 8700' (AEI, HOR); Nebraska: Valentine Refuge (AEI); Oregon: Brothers (AEI), Hyatt Reservoir (AEI), Ochroco Creek (AEI), Pinehurst (AEI); Utah: Vernat, 8400' (OTT); Washington: Pullman (CAM); Wyoming: Lagrange (LAN). Flight period: vi–viii, with a peak in vi–vii. Probably the species is univoltine.

W: Body length 2.5–3.5 mm. Temples distinctly constricted behind the eyes, 0.8 times as long as the width of an eye, tangential lines on eyes and temples intersect on the prescutellar groove (Fig. 1). Ocellar index 2.0. Malar space index 1.15. Upper mandibular tooth slightly the longer. Clypeus 2.8 times as wide as long, almost flat, smooth, with few fine punctures basally. Face very finely granulate and with fine dispersed punctures, the central swelling smooth. Frons very finely granulate and with fine dispersed punctures. Vertex and temple with very fine and very dispersed punctures on a

smooth background, outer orbit without punctures. Flagellum with 18–20 segments, filiform, 1st segment 2.7 times, 2nd segment 2.1 times, median segments and the penultimate segment 1.4–1.6 times as long as wide (Fig. 2). Pronotum granulate laterally, with fine striae in the anterior groove. Mesoscutum with fine dispersed punctures on a smooth background. Notaulus as a wrinkled furrow, extending to 0.2 the length of the mesoscutum. Prescutellar furrow with distinct striae. Scutellum bordered by carinae on the anterior 0.4, with fine dispersed punctures on a very finely granulate background. Mesopleurum with fine dispersed punctures on a smooth background. Foveate groove as a rather long shallow groove, with fine transverse striae (Fig. 3). Mesosternum with fine dispersed punctures on a smooth background. Metapleurum finely granulate and with fine dispersed punctures. Hind leg slender, femur 4.3 times as long as high. Pterostigma 2.0 times as long as wide. Metacarpus reaching to 0.4 of the distance from the radial cell to the tip of the wing. Intercubitus slightly basad of, opposite to or slightly distad of the 2nd recurrent vein (Fig. 4). First brachial cell partly open at its lower distal corner (Fig. 5). Nervellus slightly reclivous. Basal keel of propodeum 0.3 times as long as the petiolar area. Lateral area distinctly and dispersely punctate, the background very finely granulate anteriorly, distinctly granulate posteriorly. Petiolar area about 1.5 times as long as wide, almost flat, with a weak longitudinal groove, with rather dense or dispersed punctures on a finely granulate background laterally, with short transverse wrinkles in the groove and long transverse wrinkles posteriorly, its boundary narrowly rounded anteriorly



Figs 10–18. *Aneucelis obscura* spec. nov. (♀). 10. Head, top view. 11. Base of antenna. 12. Mesopleurum. 13. Pterostigma and areolet. 14. First brachial cell of front wing. 15. Propodeum, top view. 16. 1st gastral segment, side view. 17. 2nd gastral tergite, top view. 18. Ovipositor, side view.

(Fig. 6). Propodeal spiracle separated from the pleural carina by 3–4 times its diameter, the spiracular carina narrow. 1st gastral tergite 3.7 times as long as wide. Petiole 1.7 times as long as postpetiole. Postpetiole 1.4 times as long as wide, rounded dorsally, with divergent contours (in dorsal view). 1st sternite slightly surpassing the spiracles (Fig. 7). 2nd tergite 1.25 times as long as wide. Thyridium oval, close to the anterior edge of the 2nd tergite, thyridial depression indistinct, about 1.5 times as long as wide (Fig. 8). Gaster compressed posteriorly. Ovipositor 3.7–3.9 times, ovipositor sheath 2.8–3.0 times as long as the 1st tergite (Fig. 9).

Colour: Blackish or dark brown. Palpi yellowish brown to dark brown. Glossa whitish to yellowish brown. Mandible yellowish red, teeth dark brown. Antenna dark brown, scape and base of flagellum tinged with yellowish brown, apex of pedicellus and annellus often yellowish. Apical half of the clypeus and tegula light reddish brown. Legs yellowish red, hind coxa light brown. Pterostigma medium brown, the basal and apical corners with small whitish marks. Petiole tinged with yellowish red or brown.

M: Flagellum with 23 segments. Malar space index 0.9. 1st gastral tergite 4.8 times, 2nd tergite 2.6 times as long as wide. Thyridial depression about 2.5 times as long as wide. Gaster sometimes tinged with reddish brown. In other characters similar to the ♀.

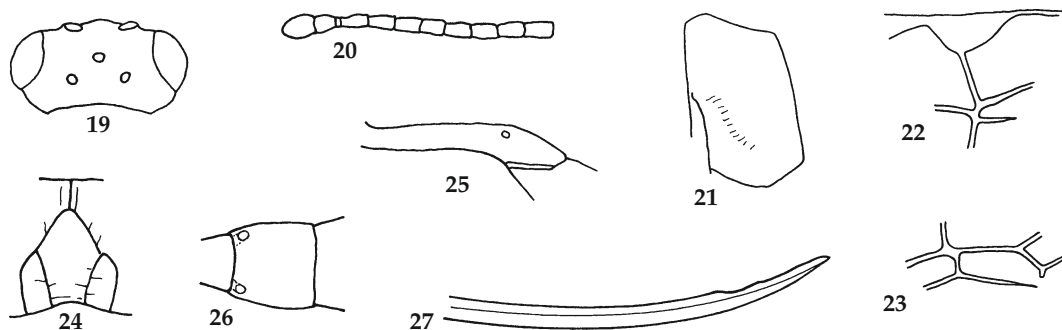
Variation: 2 ♀♀ and 2 ♂♂ from Alberta (OTT) and California (AEI) are very small: Body length 2–2.5 mm. Flagellum with 17–18 segments in the ♀, with 19–21 segments in the ♂. Face and lateral area of propodeum not granulate. Frons, mesoscutum, mesopleurum and metapleurum very finely granu-

late. Head, thorax and propodeum with very fine and very dispersed punctures. These specimens are not included in the type series.

Aneucelis obscura spec. nov.

Holotype (W): “USA: Arizona, Coconino Co., 1.2 mi. S. Jacob Lake, 7700 ft.; 26.vi.1993; J. Pinto & G. Plather” (AEI).

W: Body length 2.8 mm. Temples distinctly constricted behind the eyes, 0.7 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum (Fig. 10). Ocellar index 2.4. Malar space index 1.1. Upper mandibular tooth slightly the longer. Clypeus 2.6 times as wide as long, slightly rounded, smooth, with few fine punctures. Face distinctly granulate sublaterally, very finely granulate medially and laterally, with very fine dispersed punctures. Frons distinctly granulate ventrally, finely granulate and with very fine punctures dorsally. Vertex and temple with very fine and very dispersed punctures on a smooth background. Flagellum with 19 segments, filiform, 1st segment 2.7 times, 2nd segment 1.8 times, median segments and the penultimate segment 1.5–1.6 times as long as wide (Fig. 11). Pronotum granulate laterally, with fine striae in the anterior groove. Mesoscutum finely granulate, somewhat shining, with fine dispersed punctures. Notaulus as a short wrinkled furrow, not connected with the anterior edge of the mesoscutum. Prescutellar furrow with distinct striae. Scutellum bordered by carinae on the anterior 0.4, finely granulate and with fine dispersed punctures. Mesopleurum for the greater part with very fine dispersed punctures on a smooth background, partly with very fine granulation. Foveate groove as a rather long



Figs 19–27. *Aneucelis petiolaris* spec. nov. (♀). 19. Head, top view. 20. Base of antenna. 21. Mesopleurum. 22. Pterostigma and areolet. 23. First brachial cell of front wing. 24. Propodeum, top view. 25. 1st gastral segment, side view. 26. 2nd gastral tergite, top view. 27. Ovipositor, side view.

slightly depressed groove, with fine transverse striae (Fig. 12). Mesosternum with very fine dispersed punctures on a smooth background. Metapleurum finely granulate, punctation hardly visible. Hind leg slender, femur 4.5 times as long as high. Pterostigma 2.3 times as long as wide. Metacarpus reaching half the distance from the radial cell to the tip of the wing. Intercubitus subopposite to the 2nd recurrent vein (Fig. 13). First brachial cell partly open at its lower distal corner (Fig. 14). Nervellus reclivous. Basal keel of propodeum 0.35 times as long as the petiolar area, indistinct and replaced by wrinkles anteriorly. Lateral area finely or very finely granulate, with very fine dispersed punctures, with short wrinkles at the edges. Petiolar area 1.2 times as long as wide, almost flat, very finely granulate, punctation hardly visible, with short transverse wrinkles centrally and long transverse wrinkles posteriorly, its boundary rounded anteriorly (Fig. 15). Propodeal spiracle separated from the pleural carina by four times its diameter, the spiracular carina narrow. 1st gastral tergite 4.0 times as long as wide. Petiole 1.5 times as long as postpetiole. Postpetiole 1.6 times as long as wide, rounded dorsally, lateral contours (in dorsal view) slightly divergent. 1st sternite almost reaching the spiracles (Fig. 16). 2nd tergite 1.2 times as long as wide. Thyridium oval, distant from the anterior edge of the 2nd tergite, thyridial depression about 2.5 times as long as wide (Fig. 17). Gaster compressed posteriorly. Ovipositor 2.9 times, ovipositor sheath 2.1 times as long as the 1st tergite (Fig. 18).

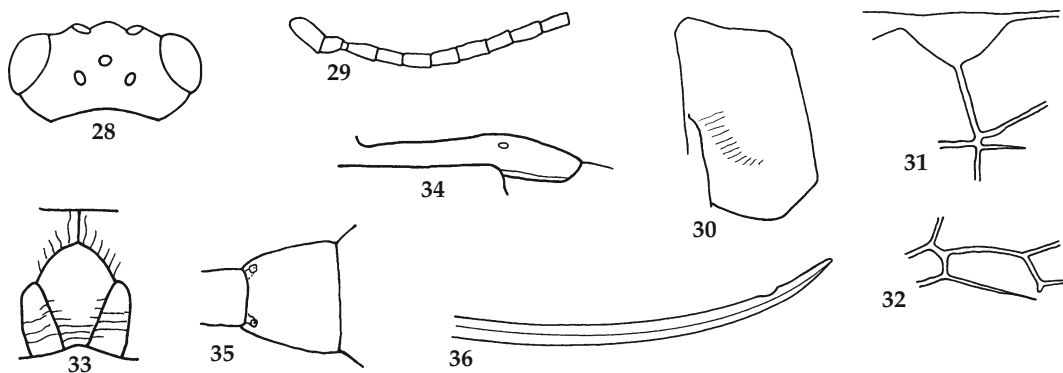
Colour: Blackish. Palpi yellowish brown. Glossa whitish. Mandible broadly yellowish brown medially. Apical half of clypeus and tegula reddish brown. Antenna dark brown. Pterostigma medium brown. Legs yellowish brown, front and mid coxae tinged with brown, hind coxa medium brown. Pilosity whitish.

M unknown.

Aneucelis petiolaris spec. nov.

Holotype (♀): “Farmingdale, Jul. 16 '38, N.Y., H. & M. Townes” (New York, USA) (AEI). – **Paratypes** (27 ♀♀, 6 ♂♂): USA: Iowa: Ames (WAS); Massachusetts: Holliston (CAM); New Mexico: Mesilla Park (HOR, WAS); New York: Farmingdale (AEI, HOR), Milford Center (AEI); Rhode Island: Westerly (AEI); Utah: Santa Clara (WAS). Flight period: vii–ix, without a clear peak. Probably the species is univoltine.

W: Body length 2–2.5 mm. Temples distinctly constricted behind the eyes, 0.6 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum (Fig. 19). Ocellar index 2.3. Malar space index 1.1. Upper mandibular tooth distinctly the longer. Clypeus 2.8 times as wide as long, scarcely rounded and with few punctures on a smooth background basally, flat and smooth subapically. Face finely granulate, without punctures, central swelling almost smooth. Frons finely granulate, without punctures. Vertex and temple with very fine and very dispersed punctures on a smooth background, sometimes the vertex very finely granulate. Flagellum with 15–16 segments, filiform, 1st segment 2.2 times, 2nd segment 1.6 times, median segments and the penultimate segment 1.3–1.4 times as long as wide, the last segment sometimes enlarged (Fig. 20). Pronotum granulate laterally, with some short striae in the anterior groove. Mesoscutum granulate and dull, without punctures. Notaulus as a small groove, extending to 0.15 the length of the mesoscutum. Prescutellar furrow with very fine striae. Scutellum bordered by carinae on the anterior 0.3–0.4, granulate. Mesopleurum (including speculum) finely or very finely granulate, with fine dispersed punctures. Foveate groove slightly depressed, with fine transverse striae (Fig. 21). Mesosternum very finely granulate and with very fine dispersed punctures. Metapleurum finely granulate, shining.



Figs 28–36. *Aneucelis rufula* spec. nov. (♀). 28. Head, top view. 29. Base of antenna. 30. Mesopleurum. 31. Pterostigma and areolet. 32. First brachial cell of front wing. 33. Propodeum, top view. 34. 1st gastral segment, side view. 35. 2nd gastral tergite, top view. 36. Ovipositor, side view.

Hind leg slender, femur 4.0 times as long as high. Pterostigma 2.2 times as long as wide. Metacarpus reaching to 0.7 of the distance from the radial cell to the tip of the wing. Intercubitus rather long, thick, slightly basad of the 2nd recurrent vein (a rather variable character) (Fig. 22). First brachial cell partly open at its lower distal corner (Fig. 23). Nervellus slightly reclivous. Basal keel of propodeum 0.3–0.4 times as long as the petiolar area, complete. Lateral area finely granulate, shining, with some wrinkles at the edges. Petiolar area 1.5 times as long as wide, flat, finely granulate, with fine transverse wrinkles laterally and posteriorly, its boundary narrowly rounded or slightly pointed anteriorly (Fig. 24). Propodeal spiracle separated from the pleural carina by 3–4 times its diameter, the spiracular carina narrow. 1st gastral tergite 3.4 times as long as wide. Petiole 1.8 times as long as postpetiole. Postpetiole 1.2 times as long as wide, rounded dorsally, lateral contours (in dorsal view) slightly divergent. 1st sternite slightly surpassing the spiracles (Fig. 25). 2nd tergite 0.9 times as long as wide. Thyridium small, circular, close to the anterior edge of the 2nd tergite, thyridial depression 1.0–1.5 times as long as wide (Fig. 26). Gaster slightly compressed and slightly clavate posteriorly. Ovipositor 3.1–3.2 times, ovipositor sheath 2.3–2.5 times as long as the 1st gastral tergite (Fig. 27).

Colour: Yellowish red or light reddish brown. Palpi, glossa, mandible (teeth slightly darker), clypeus, scape, pedicellus, tegula, legs and 1st gastral tergite yellowish or yellowish red. Ocellar triangle tinged with brown. Sometimes head tinged with dark brown dorsally. Flagellum yellowish red ventrally, brownish dorsally. Pterostigma light brown. Posterior gastral tergites often tinged with brown or black dorsally (see below).

M: Flagellum with 17–18 segments. Malar space index 1.0. Mandibular teeth equal. 1st gastral tergite 4.6 times, 2nd tergite 1.3 times as long as wide. Thyridial depression 1.5–2.0 times as long as wide. In other characters similar to the ♀.

Variation: In a series (♀♀, ♂♂, including the holotype) from New York State the posterior gastral tergites are distinctly marked with dark brown or black, whereas in a series from New Mexico they are yellowish red without dark markings. Because the distribution of the species is insufficiently known, the material is not subdivided into two subspecies.

Aneucelis rufula spec. nov.

Holotype (♀): “Chaffey’s Locks, VI. 11. 75, Ont., J. Bellwood” (Ontario, Canada) (AEI). – **Paratypes**: 2 ♀♀ from the same locality (AEI, HOR). Flight period: v–vi.

W: Body length 2–2.5 mm. Temples strongly constricted behind the eyes, 0.7 times as long as the width of an eye, tangential lines on eyes and temples intersect on the centre of the mesoscutum (Fig. 28). Ocellar index 2.0. Malar space index 1.2. Upper mandibular tooth slightly the longer. Clypeus 2.7 times as wide as long, almost flat, very finely granulate basally, smooth medially and subapically, with few fine punctures. Face granulate, dull, the central swelling slightly shining. Frons finely granulate, without punctures. Vertex and ventral part of temple very finely granulate, dorsal part of temple with a smooth background, all parts with very fine dispersed punctures. Flagellum with 17 segments, filiform, 1st segment 2.9 times, 2nd segment 2.2 times, median segments and the penultimate segment 1.5–1.6 times as long as wide (Fig. 29). Pronotum

granulate and dull laterally, with short striae in the anterior groove. Mesoscutum granulate and dull. Notaulus as a fine groove, extending to 0.2 the length of the mesoscutum. Prescutellar furrow with short striae. Scutellum bordered by carinae on the anterior 0.4, granulate. Mesopleurum (including speculum) with fine rather dense or dense punctures on a finely granulate background, slightly shining. Foveate groove slightly depressed, with fine transverse striae (Fig. 30). Mesosternum with fine rather dense or dense punctures on an almost smooth background. Metapleurum granulate, dull. Hind leg slender, femur 4.1 times as long as high. Pterostigma 2.0 times as long as wide. Metacarpus reaching to 0.8 of the distance from the radial cell to the tip of the wing. Intercubitus short and thick, slightly basad of the 2nd recurrent vein (Fig. 31). First brachial cell partly open at its lower distal corner (Fig. 32). Nervellus slightly reclivous. Basal keel of propodeum 0.45 times as long as the petiolar area, rather fine. Lateral area granulate and dull, with rather long longitudinal wrinkles beside the basal keel and short wrinkles posteriorly. Petiolar area 1.3 times as long as wide, flat, granulate, with short wrinkles laterally and a few long transverse wrinkles posteriorly, its boundary rounded anteriorly (Fig. 33). Propodeal spiracle small, separated from the pleural carina by 2–3 times its diameter, the spiracular carina partly narrow. 1st gastral tergite 4.2 times as long as wide. Petiole 1.9 times as long as postpetiole. Postpetiole 1.4 times as long as wide, rounded dorsally, lateral contours (in dorsal view) slightly divergent. 1st sternite reaching the spiracles (Fig. 34). 2nd tergite 0.8 times as long as wide. Thyridium circular, close to the anterior edge of the 2nd tergite, thyridial depression about as long as wide (Fig. 35). Gaster clavate posteriorly. Ovipositor 2.3–2.4 times, ovipositor sheath 1.5–1.7 times as long as the 1st tergite (Fig. 36).

Colour: Head dark brown, ventral part of face and the genae tinged with reddish brown. Palpi and glossa whitish. Clypeus and ventral parts of scape, pedicellus and flagellar base light reddish brown. Other parts of the flagellum brown. Thorax, propodeum and gaster yellowish red. Tegula and legs yellowish. Pterostigma medium brown. Middle gastral tergites tinged with brown dorsally. Pilosity whitish.

M unknown.

Taxonomic remarks: *A. rufula* is similar to *A. minutissima* (Khalaim) from the eastern Palaearctic region. The latter differs by: Mesopleurum distinctly granulate, a fine punctation hardly visible. Lateral area of propodeum without distinct longitudinal wrinkles beside the basal keel. Petiolar area pointed anteriorly. Thorax, propodeum and gaster dark brown

(according to 2 female paratypes from Mongolia and Kazakhstan; Zoologische Staatssammlung München).

Diaparsis Förster

Subgen. *Diaparsis* Förster

Diaparsis Förster, 1869. Type species: *Ophion nutritor* Fabricius (Horstmann 2005: 1261 f.).

Diaparsus Thomson, 1889. Emendation for *Diaparsis* Förster.

Luchatema Walkley, 1956. Type species: *Luchatema balduffi* Walkley.

Pseudaneuclis Horstmann, 1971. Type species: *Pseudaneuclis rara* Horstmann.

Diaparsis Förster is a large genus of worldwide distribution (Townes 1971: 47, Gauld 1984: 311, Khalaim 2005: 407 f.). It was re-described by Horstmann (1971: 100 f.), Townes (1971: 47 f.) and Gauld (1984: 311). Several subgenera are recognized, which were discussed by Horstmann (1971: 97 ff., 1981: 5) and Khalaim (2002: 386 ff., 2005: 407 ff.). In the Nearctic region, only the subgenus *Diaparsis* occurs, therefore the other subgenera are not mentioned here. Three of the twelve Nearctic species treated here were described from the Nearctic region by previous authors, one species described from Europe was introduced into the United States, where it became established, and eight species are described as new.

The general distribution of the Nearctic species of *Diaparsis* is different from that of *Barycnemis* Förster (revised by Horstmann 2010). From the thirteen Nearctic *Barycnemis* species, nine were found in Alaska, and seven were described from Europe. In contrast, none of the eleven truly Nearctic *Diaparsis* species is known from Alaska or from the Palaearctic region (discounting the introduced species *D. temporalis*).

The following character states apply to all species discussed here and are not repeated in the descriptions: Ratio of the shortest distance between the inner margins of the eyes to the longest distance between the outer contours of the eyes 0.6 (exception: *D. punctata*). Face about as wide as frons. Clypeus 0.7–0.8 times as long as the face. Apical margin of the clypeus rounded, blunt, with a transverse row of bristles. Genal carina low ventrally, oral carina obliterated (exception: *D. erythrostoma*). Thorax short, 1.8–2.0 times as long as the width of the mesoscutum. Epomia obliterated. Prepectal carina bent forwards dorsally. Hind tibia distinctly longer than hind femur. Hind basitarsus about half as long as hind tibia. Longer hind tibial spur almost straight distally, about 0.3 times as long as the basitarsus. Hind tarsal claws short, not pectinate. Intercubitus of front wing

distinctly basad of the 2nd recurrent vein (Fig. 40). First brachial cell closed at its lower distal corner, but the postnervulus interrupted by a bulla (Fig. 41) (exception: some specimens of *D. crassa*). Nervellus reclivous. Gastral tergites of the females incised posteriorly from the 5th tergite onwards (exception: *D. striata*).

Key to Nearctic species

1. Lateral area of propodeum evenly granulate dorsally and laterally, at most with very fine and hardly visible punctures, at most with short wrinkles at the edges or beside the basal keel. 2.
 - Lateral area of propodeum with punctures or wrinkles on a granulate or smooth background (sometimes distinct wrinkles only posteriorly and laterally). 5.
2. Flagellum with 14–15 segments. Glossa half as long as the width of the clypeus. Temple and mesopleurum finely granulate, somewhat shining, punctuation hardly or not at all visible. Ovipositor 2.3 times, ovipositor sheath 1.5 times as long as 1st gastral tergite. *striata* spec. nov. ♀
 - Flagellum with 16–31 segments. 3.
3. Flagellum with 25–31 segments. Glossa 0.6 times as long as the width of the clypeus. Mid coxa, hind coxa and hind femur brown or black. Gaster marked with black black anteriorly and dorsally. Ovipositor 1.5–1.6 times, ovipositor sheath 0.85–0.9 times as long as 1st tergite. *temporalis* Horstmann ♀♂
 - Flagellum with 16–19 segments. Legs and gaster yellowish or reddish. Ovipositor and ovipositor sheath longer. 4.
4. Temple and speculum with fine and dispersed punctures on a finely granulate background. Glossa usually about as long as the width of the clypeus. Ovipositor 3.3 times, ovipositor sheath 2.4–2.6 times as long as 1st gastral tergite. *flavipes* spec. nov. ♀♂
 - Temple and mesopleurum distinctly granulate, dull, without punctures, the granulation of the mesopleurum coarse centrally. Glossa 0.3 times as long as the width of the clypeus. Ovipositor 3.0 times, ovipositor sheath 2.0 times as long as 1st gastral tergite. *opaca* spec. nov. ♀
5. Foveate groove obliterated, sometimes a few fine striae present (Fig. 114). Lateral area of propodeum with fine dispersed or rather dense punctures on a finely granulate or smooth background, sometimes with a few wrinkles posteriorly and beside the basal keel (Fig. 116). Ovipositor 3.7 times, ovipositor sheath 2.5 times as long as 1st gastral tergite. *splendens* spec. nov. ♀♂
 - Foveate groove as a distinct row of pits or striae (and/or sculpture of the lateral area of propodeum different) (Figs 57, 89, 105). 6.
6. Lateral area of propodeum with fine or distinct punctures on a very finely granulate or smooth background. 7.
 - Lateral area of propodeum distinctly punctate on a distinctly granulate and dull background or partly or completely wrinkled. 8.
7. Lateral area of propodeum with fine dispersed punctures on a finely granulate background, the background smooth centrally. Gaster almost completely black. Ovipositor 3.9 times, ovipositor sheath 2.8 times as long as 1st gastral tergite. *nigrella* spec. nov. ♀
 - Lateral area of propodeum with distinct rather dense punctures on a smooth background. Gaster broadly marked with yellowish red laterally. Ovipositor 2.5 times, ovipositor sheath 1.5 times as long as 1st gastral tergite. *punctata* spec. nov. ♀♂
8. Lateral area of propodeum with distinct rather dense or dense punctures on a distinctly granulate background, dull. Petiole circular in cross-section, without longitudinal carinae or striae, the glymmae as isolated pits in front of the posterior end of the petiole (Fig. 60). Ovipositor 2.2 times, ovipositor sheath 1.3 times as long as 1st gastral tergite. *brevicauda* spec. nov. ♀♂
 - Lateral area of propodeum at least partly with distinct wrinkles, sometimes the anterior part with only fine sculpture. Petiole with fine or distinct dorsolateral carinae, often with striae, the glymmae close to the posterior end of the petiole (Figs 43, 52) (exception: *D. baldufi*). 9.
9. Body length 2.5–4 mm. Flagellum with 14–21 segments. Mesopleurum usually with distinct punctures on a finely or distinctly granulate background (in *D. americana* rarely the background smooth centrally). 10.
 - Body length 4.5–7 mm. Flagellum with 22–31 segments. Mesopleurum with distinct punctures on a smooth background. Glossa 0.5–0.6 times as long as the width of the clypeus. 11.
10. Glossa usually 0.9–1.2 times as long as the width of the clypeus (but 0.5–0.7 times as long in a variety). Petiolar area of propodeum rather nar-

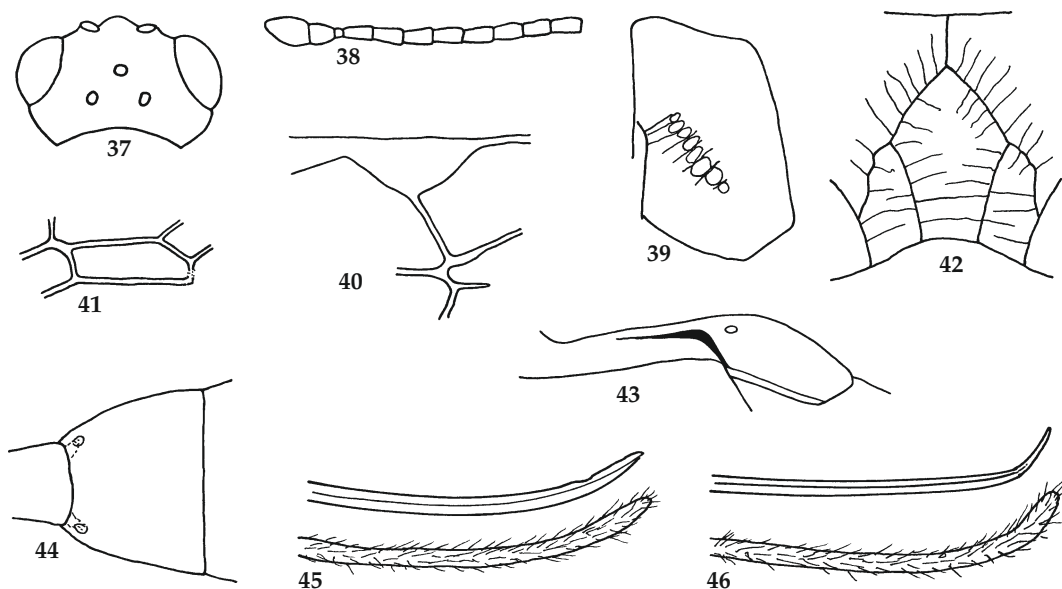
- row, 1.3–1.5 times as long as wide (Fig. 42). Ovipositor 2.4–3.1 times, ovipositor sheath 1.6–2.3 times as long as 1st gastral tergite. *americana* (Brues) ♀♂
- Glossa 0.5–0.7 times as long as the width of the clypeus. Petiolar area of propodeum rather wide, about 1.2 times as long as wide (Fig. 67). Ovipositor 2.0 times, ovipositor sheath 1.2 times as long as 1st gastral tergite. *crassa* spec. nov. ♀♂
 - 11. Flagellum yellowish brown basally (to a variable extent). Hind coxa yellowish red or reddish brown. Gaster behind the 1st tergite almost completely reddish brown. Ovipositor 3.4–4.4 times, ovipositor sheath 2.8–3.9 times as long as 1st gastral tergite. *baldufi* (Walkley) ♀♂
 - Flagellum blackish basally. Hind coxa marked with brown basally. Posterior gastral tergites marked with brown or black in the ♂ (sometimes marked with brown in the ♀ too). Ovipositor 2.8–2.9 times, ovipositor sheath 1.9–2.0 times as long as 1st gastral tergite. *erythrostoma* (Cameron) ♀♂

Diaparsis americana (Brues)

W: Body length 2.5–4 mm. Temples distinctly constricted behind the eyes, 0.75 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum or propodeum (Fig. 37). Head 1.1 times as wide as high. Ocellar index 2.4. Malar space index 0.9–1.0. Glossa 0.9–1.2 times as long as the width of the clypeus (but see below). Upper mandibular tooth distinctly the longer. Clypeus 2.3 times as wide as long, almost flat, smooth, with some large punctures basally, sometimes finely granulate basally. Face with fine dispersed punctures on a very finely granulate background, central swelling smooth. Frons with very fine dispersed punctures on a finely granulate background, shining. Sometimes face and frons distinctly granulate and with very fine punctures. Vertex and temple with very fine dispersed punctures on a smooth background, or the background sometimes very finely granulate. Flagellum with 15–20 segments, filiform or slightly clavate, 1st segment 2.8 times, 2nd segment 1.8 times, median segments and the penultimate segment 1.6–1.7 times as long as wide (Fig. 38), sometimes the penultimate segment 1.3 times as long as wide (see below). Pronotum with fine rather dense punctures on a granulate background dorsolaterally, the anterior groove striate. Mesoscutum with distinct punctures on a granulate background centrally, with fine punctures on a finely granulate background

sublaterally. Sometimes mesoscutum distinctly granulate and with very fine punctures. Notaulus as a wrinkled groove, extending to 0.2 the length of the mesoscutum. Prescutellar furrow with distinct striae. Scutellum bordered by carinae on the anterior 0.4, with fine dispersed punctures on a granulate background. Mesopleurum with distinct dispersed or rather dense or dense punctures on a finely granulate background, or sometimes the background smooth or distinctly granulate and dull and the punctures fine. Foveate groove as a rather long row of distinctly depressed pits (Fig. 39). Mesosternum with fine dispersed punctures on a very finely granulate background. Metapleurum granulate and with fine and dense punctures, or sometimes rugose-punctate or distinctly granulate and without punctures. Hind leg rather slender, femur 3.9 times as long as high. Pterostigma 2.2 times as long as wide (Fig. 40). Metacarpus reaching half the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.4 times as long as the petiolar area, distinct. Lateral area granulate and punctate anteriorly (the punctures sometimes obliterated), with distinct rather long wrinkles posteriorly and laterally, or completely wrinkled. Petiolar area 1.3–1.5 times as long as wide, flat, granulate or rugose-punctate anteriorly, with transverse wrinkles posteriorly, its boundary pointed or rounded anteriorly (Fig. 42). Propodeal spiracle separated from the pleural carina by 2.0 times its diameter, the spiracular carina partly narrow. 1st gastral tergite 1.8 times as long as wide. Petiole 1.5 times as long as postpetiole, smooth and almost flat dorsally, sometimes with a shallow depression posteriorly, with distinct dorsolateral carinae, with rather large glymmae situated at the posterior end of the petiole and connected with the ventrolateral furrow of the postpetiole, for the greater part smooth in front of the glymmae, sometimes with a few fine striae or short grooves in front of the glymmae. Postpetiole 1.2 times as long as wide, rounded dorsally, contours divergent (in dorsal view). 1st sternite reaching the spiracles (Fig. 43). 2nd tergite 0.6 times as long as wide. Thyridium subcircular, close to the anterior edge of the 2nd tergite, thyridial depression weak, about as long as wide (Fig. 44). Gaster clavate posteriorly. Ovipositor 2.4–3.1 times, ovipositor sheath 1.6–2.3 times as long as the 1st tergite. Ovipositor slightly bent upwards proximally and medially, distinctly bent upwards distally, either with a shallow rounded dorsal depression subapically and without teeth (Fig. 45), or distinctly narrowed and strongly bent upwards subapically, without a rounded dorsal depression (Fig. 46) (see below).

Colour: Blackish. Palpi yellowish brown or brown. Glossa, mandible (teeth dark brown), scape, pedicellus, tegula, legs and gaster yellowish or



Figs 37–46. *Diaparsis americana* (Brues) (♀). 37. Head, top view. 38. Base of antenna. 39. Mesopleurum. 40. Pterostigma and areolet. 41. First brachial cell of front wing. 42. Propodeum, top view. 43. 1st gastral segment, side view. 44. 2nd gastral tergite, top view. 45–46. Ovipositor and ovipositor sheath, side view.

yellowish red. Flagellum often tinged with yellow basally. Clypeus often completely yellowish red or yellowish red apically. Mid and hind coxae often marked with brown or black. Pterostigma medium brown or dark brown. Sometimes the 1st gastral segment brown and the 3rd to 5th tergites marked with brown dorsally. Sometimes gaster reddish brown and the 2nd tergite marked with yellow posteriorly. Sometimes head dark brown, thorax light reddish brown, legs and gaster yellowish.

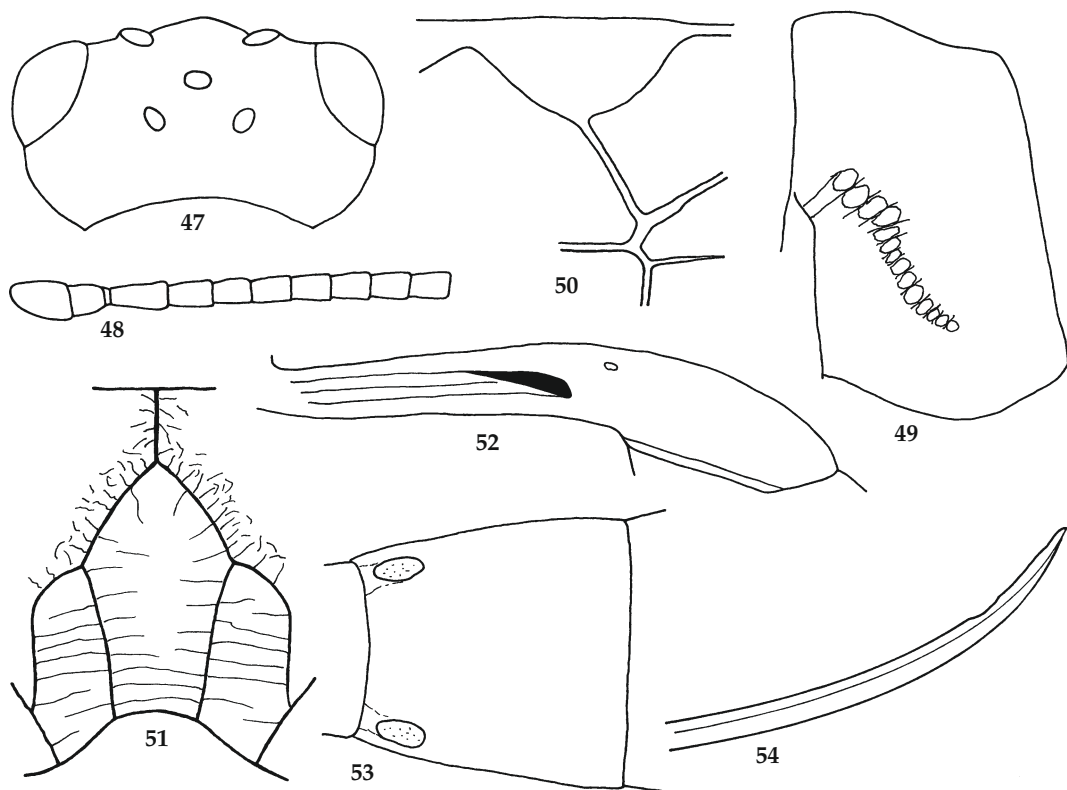
M: Flagellum with 17–20 segments, slender, slightly attenuated. 1st gastral tergite 3.7 times, 2nd tergite 1.2 times as long as wide. In other characters similar to the ♀, with similar variation.

Variation: This species is very variable. In small ♀♀ (body length 2.5–3 mm) the flagellum consists of 15–17 segments and is slightly clavate, the penultimate segment is about 1.3 times as long as wide, the last segment is enlarged. In large ♀♀ (body length 3.5–4 mm) the flagellum consists of 17–20 segments and is filiform, the penultimate segment is 1.6 times as long as wide, the last segment is slender. The glossa usually is 0.9–1.2 times as long as the width of the clypeus, but in about 5 % of the ♀♀ and 16 % of the ♂♂ it is 0.5–0.7 times as long as the width of the clypeus (in a series of 66 ♀♀ and 57 ♂♂). Apparently this variation does not depend on body size. The relative length of the ovipositor (length of ovipositor divided by length of 1st gastral tergite)

varies between 2.4 and 3.1. In small ♀♀ the ovipositor is always relatively short, but among the large ♀♀ some have a relatively long ovipositor. In about half of the ♀♀ the ovipositor is evenly bent upwards and evenly tapered towards its tip (Fig. 45). But in the other ♀♀ the ovipositor is distinctly narrowed and bent upwards short before its tip (Fig. 46). Apparently this variation does not depend on body size either. The variation in sculpture and colour is described above.

The holotype (♀) is characterized by: Body length about 3 mm. Flagellum with 18 segments, slightly clavate. Glossa about as long as the width of the clypeus. Basal part of the clypeus and temple punctate on a finely granulate background. Face, frons, mesoscutum, mesopleurum, metapleurum and lateral area of propodeum distinctly granulate, punctation reduced. Ovipositor sheath 1.7 times as long as 1st gastral tergite. Ovipositor tip evenly tapered and not distinctly narrowed (as in Fig. 45).

Material (167 ♀♀, 169 ♂♂): Canada: Alberta (OTT); British Columbia (OTT, WAH); Manitoba (OTT); Ontario (LAN, OTT); Saskatchewan (AEI, OTT). USA: Colorado (LAN); District of Columbia (WAS); Idaho (AEI, LAN); Kentucky (AEI); Maine (ITH); Maryland (AEI, WAS); Massachusetts (CAM); Michigan (AEI, LAN, NHM, WAH, WAS); Missouri (OTT); Nevada (LAN); New Jersey (WAS); New Mexico (WAS); New York (AEI, ITH, WAS); North Carolina (AEI, OTT); Ohio (AEI); Oregon (AEI, LAN); Pennsylvania (AEI); Rhode Island (AEI);



Figs 47–54. *Diaparsis baldufi* (Walkley) (♀). 47. Head, top view. 48. Base of antenna. 49. Mesopleurum. 50. Pterostigma and areolet. 51. Propodeum, top view. 52. 1st gastral segment, side view. 53. 2nd gastral tergite, top view. 54. Ovipositor, side view.

South Carolina (AEI); South Dakota (WAS); Utah (AEI); West Virginia (AEI); Virginia (AEI); Wisconsin (AEI, WAS); Wyoming (CAM, LAN). Flight period: vi–ix (one specimen each in iv and v), with a distinct peak in viii–ix. Probably the species is univoltine. In Wyoming, a few specimens were collected at 2000–2100 m a.s.l. (CAM, LAN).

Diaparsis baldufi (Walkley)

W: Body length 5–7 mm. Temples distinctly constricted behind the eyes, 0.9 times as long as the width of an eye, tangential lines on eyes and temples intersect on the propodeum (Fig. 47). Head 1.2 times as wide as high. Ocellar index 2.1. Malar space index 1.0–1.1. Glossa half as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.7 times as wide as long, almost flat, smooth, with some distinct punctures basally and medially, without punctures subapically. Face and frons with fine rather dense or dense punctures on a slightly granulate or smooth background.

Vertex and temple with fine dispersed punctures on a smooth background, outer orbit without punctures. Flagellum with 22–27 segments, filiform, 1st segment 2.0 times, 2nd segment 1.6 times, median segments and the penultimate segment 1.4 times as long as wide (Fig. 48). Pronotum with dense or very dense punctures on a smooth background laterally, the anterior groove striate. Mesoscutum and scutellum with distinct and rather dense or dense punctures on a smooth background. Notaulus as a wrinkled groove, extending to 0.3 the length of the mesoscutum. Prescutellar furrow distinctly striate. Scutellum bordered by carinae on the anterior 0.4. Mesopleurum and mesosternum with distinct rather dense or dense punctures on a smooth background. Foveate groove as a distinctly depressed row of pits (Fig. 49). Prepectal carina somewhat raised. Metapleurum very densely rugose-punctate or rugose. Hind leg rather slender, femur 4.2 times as long as high. Pterostigma 2.2 times as long as wide (Fig. 50). Metacarpus reaching to 0.6 of the distance from the radial cell to the tip of the wing. Basal keel

of propodeum 0.3 times as long as the petiolar area, distinct. Lateral area with coarse irregular wrinkles. Petiolar area about 1.6 times as long as wide, flat, punctate or with irregular or longitudinal wrinkles anteriorly, with transverse wrinkles posteriorly, its boundary rounded or weakly pointed anteriorly (Fig. 51). Propodeal spiracle separated from the pleural carina by twice its diameter, the spiracular carina partly narrow. 1st gastral tergite 3.2 times as long as wide. Petiole 1.4 times as long as postpetiole, slightly rounded dorsally, with fine sculpture or smooth, with distinct dorsolateral carinae, with long striae laterally, glymmae as long narrow furrows, which are not connected with the ventrolateral furrow of the postpetiole. Postpetiole 1.4 times as long as wide, rounded dorsally, with divergent contours (in dorsal view). 1st sternite distinctly surpassing the spiracles (Fig. 52). 2nd tergite about as long as wide. Thyridium oval, situated close to the anterior edge of the 2nd tergite, thyridial depression 1.5–2.0 times as long as wide (Fig. 53). Gaster clavate posteriorly. Ovipositor 3.4–4.4 times, ovipositor sheath 2.8–3.9 times as long as the 1st tergite. Ovipositor thin, slightly bent upwards proximally and medially, distinctly bent upwards distally (but often distinctly bent upwards over its total length as a result of the mounting procedure), with a very shallow rounded dorsal depression subapically, without teeth (Fig. 54).

Colour: Head and thorax black. Palpi, glossa, mandible (teeth dark brown), scape, pedicellus, base of flagellum (to a variable extent), tegula, legs and gaster behind the 1st segment yellowish red. Clypeus brownish apically or completely yellowish red. Flagellum brown distally. Pterostigma dark brown. Petiole dark brown or black, postpetiole reddish brown. 2nd tergite sometimes marked with dark brown anteriorly. Pilosity whitish.

M: Flagellum with 23–31 segments, slightly attenuated. 1st gastral tergite 4.6 times, 2nd tergite 2.1 times as long as wide. Glymmae often not discernible between the longitudinal striae of the petiole, in small ♂♂ the petiole almost smooth laterally. Thyridium elongate, thyridial depressed about three times as long as wide. Flagellum often completely yellowish brown. In other characters similar to the ♀.

Material (49 ♀♀, 33 ♂♂): Canada: Alberta (AEI, OTT); British Columbia (OTT, WAH); Saskatchewan (AEI, OTT). USA: Arizona (FRA); Iowa (OTT, WAS); Kansas (WAS); Massachusetts (CAM, WAS); Nebraska (WAS); New York (AEI, ITH, WAS); Oregon (AEI); South Dakota (AEI, WAS); Utah (AEI); Washington (AEI); Wisconsin (WAS); Wyoming (WAS). The paratypes (80 ♀♀, 55 ♂♂) listed by Walkley (1956: 156) from Canada (Saskatchewan) and USA (Illinois, Minnesota, Wisconsin) (WAS) were not studied (the holotype from Chetek, Wisconsin was studied). Flight period vi–ix (one

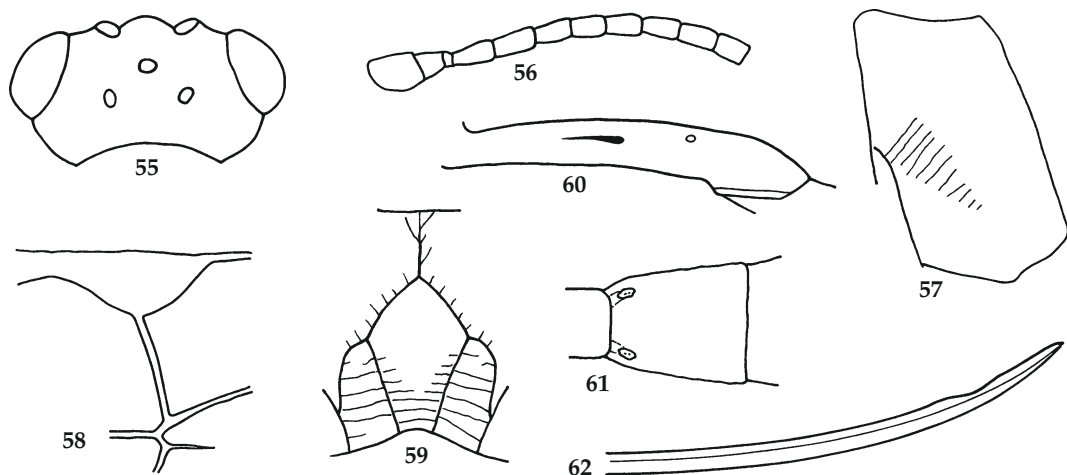
specimen in x), with a distinct peak in vii. In Wyoming, a few specimens were collected at about 2000 m a.s.l. (CAM, WAS).

Host: *Rhynchites bicolor* (Fabricius) (Atteblabidae). The host and the parasitoid are both univoltine. Larvae of the host feed in summer in hips of several *Rosa* species (Rosaceae), drop to the ground in fall, form earthen cells in the soil, in which they hibernate, and pupate in spring. The new adults emerge in late spring. The parasitoid females oviposit in the host larvae (predominantly in smaller instars) in the hips, the solitary parasitoid larva hibernates as first instar in the host larva, kills the host in spring and spins its own cocoon inside of the host cell, in which it pupates a few days later. The new adults emerge from late June to early August (Balduf 1959).

Diaparsis brevicauda spec. nov.

Holotype (♀): “Tappan L., O., Aug. 16, 1983, C. Dasch” (Tappan Lake, Ohio, USA) (AEI). – **Paratypes** (28 ♀♀, 5 ♂♂): USA: Florida: Gainesville (AEI); Louisiana: Bayou Chicot, Evangeline Co. (OTT); Maryland: Takoma Park (AEI, HOR); Michigan: Ann Arbor (AEI, NHM), Crooked Lake (AEI), Gull Lake Biological Station, Kalamazoo Co. (LAN); New York: Farmingdale (AEI), Oswego (WAS), Poughkeepsie (AEI); Ohio: New Concord (AEI, HOR), Otsego (AEI), Tappan Lake (AEI, HOR); South Carolina: Cleveland (AEI), Pendleton (AEI). Flight period: vi–ix (one specimen in v), with a peak in vii. Probably the species is univoltine. No specimen was labelled as having been collected at high altitudes.

W: Body length 3–4 mm. Temples strongly constricted behind the eyes, 0.7 times as long as the width of an eye, tangential lines on eyes and temples intersect on the posterior half of the mesoscutum (Fig. 55). Head 1.2 times as wide as high. Ocellar index 2.1. Malar space index 0.7. Glossa 0.3 times as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.8 times as wide as long, slightly rounded, very finely granulate and with a few punctures basally and medially, with a very shallow smooth transverse groove subapically. Face and frons with fine dense punctures on a granulate background, dull. Vertex with fine rather dense or dispersed punctures, temple with fine very dispersed punctures, both on a finely granulate background. Flagellum with 20–24 segments, often filiform, 1st segment 2.4 times, 2nd segment 1.7 times, median segments 1.7 times, penultimate segment 1.2 times as long as wide (Fig. 56). Sometimes flagellum slightly clavate, penultimate segment as long as wide, the last segment enlarged. Pronotum with fine and very dense punctures on a granulate background laterally, the anterior groove striate.



Figs 55–62. *Diaparsis brevicauda* spec. nov. (♀). 55. Head, top view. 56. Base of antenna. 57. Mesopleurum. 58. Pterostigma and areolet. 59. Propodeum, top view. 60. 1st gastral segment, side view. 61. 2nd gastral tergite, top view. 62. Ovipositor, side view.

Mesoscutum and scutellum with fine and dense punctures on a granulate background, dull. Notaulus as a wrinkled groove, extending to 0.3 the length of the mesoscutum. Prescutellar furrow distinctly striate. Scutellum bordered by carinae on the anterior 0.3. Mesopleurum with fine rather dense or dense punctures on a granulate background, sometimes a small central area without punctures. Foveate groove slightly depressed, covered by a long series of distinct transverse striae (Fig. 57). Mesosternum granulate and with rather dense punctures. Metapleurum distinctly granulate, dull, with fine and dense punctures. Hind leg slender, femur 4.4 times as long as high. Pterostigma 2.3 times as long as wide (Fig. 58). Metacarpus reaching to 0.9 of the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.45 times as long as the petiolar area, distinct posteriorly, covered with wrinkles anteriorly. Lateral area distinctly granulate, dull, with distinct rather dense punctures, with short wrinkles at the edges. Petiolar area 1.5 times as long as wide, flat, granulate, dull, with fine dense punctures, partly rugose-punctate, with fine transverse striae posteriorly, its boundary rounded anteriorly (Fig. 59). Propodeal spiracle separated from the pleural carina by 1.5 times its diameter, the spiracular carina narrow. 1st gastral tergite 4.6 times as long as wide. Petiole 1.8 times as long as postpetiole, circular in cross-section, smooth, without dorsolateral carinae, the glymmae as small furrows, distant from the posterior edge of the petiole, not connected with the ventrolateral furrow of the postpetiole, sometimes with fine striae in front of the glymmae. Postpetiole 1.6 times as long as wide, rounded dorsally, with

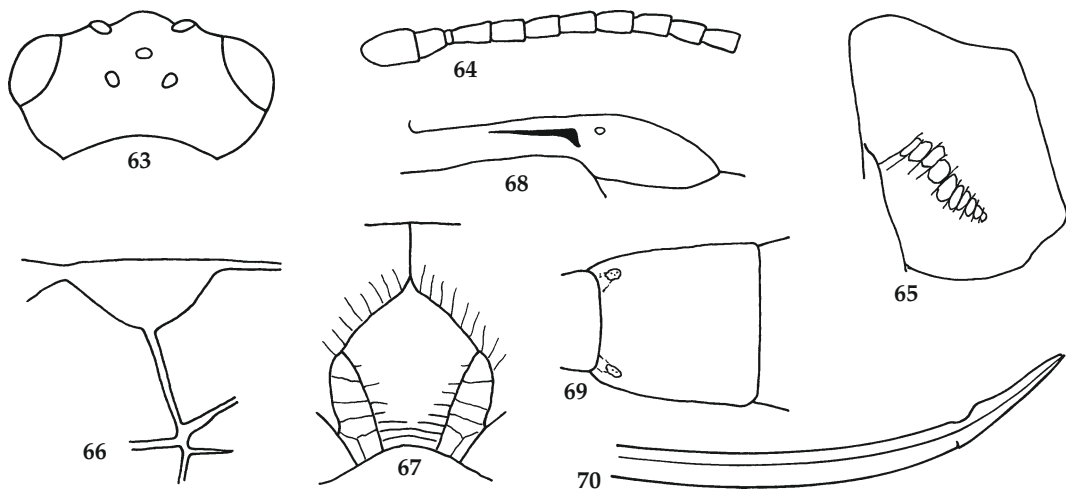
almost parallel contours (in dorsal view). 1st sternite distinctly surpassing the spiracles (Fig. 60). 2nd tergite about as long as wide. Thyridium oval or elongate, situated close to the anterior edge of the 2nd tergite, thyridial depression 1.5–2.0 times as long as wide (Fig. 61). Gaster clavate and slightly compressed posteriorly. Ovipositor 2.2 times, ovipositor sheath 1.3 times as long as the 1st tergite. Ovipositor slender, slightly bent upwards over its total length, with a scarcely visible rounded dorsal depression subapically, without teeth (Fig. 62).

Colour: Black. Palpi, mandible (teeth dark brown), apical half of clypeus, scape, pedicellus, base of flagellum (to a variable extent), tegula and legs yellowish or yellowish red. Clypeus sometimes reddish brown apically. Flagellum dark brown distally. Mid and hind coxa often reddish brown. Pterostigma light brown. Gaster behind the 1st segment yellowish red or reddish brown, often the 2nd and 3rd tergites reddish brown, marked with yellow posteriorly, the posterior tergites yellowish red. Pilosity whitish.

M: Flagellum with 21–26 segments, filiform. 1st gastral tergite 5.0 times, 2nd tergite 1.9 times as long as wide. Posterior gastral tergites dark brown or black. In other characters similar to the ♀.

Diaparsis crassa spec. nov.

Holotype (♀): “Poughkeepsie, Jl. 16, 1938, N. Y., H. K. Townes” (State New York, USA) (AEI). – **Paratypes** (79 ♀♀, 77 ♂♂): Canada: Alberta: McMurrey (OTT), Rycroft (OTT); British Columbia: Ainsworth (WAS), Carbonate Columbia River (ITH), Dounie Creek, Sel-



Figs 63–70. *Diaparsis crassa* spec. nov. (♀). 63. Head, top view. 64. Base of antenna. 65. Mesopleurum. 66. Pterostigma and areolet. 67. Propodeum, top view. 68. 1st gastral segment, side view. 69. 2nd gastral tergite, top view. 70. Ovipositor, side view.

kirk Mountains (ITH), Hixon (OTT), Kaslo (WAS), Liard River, Hot Springs, 1725' (OTT), Mission City (OTT), Robson (OTT), Terrace (OTT); Newfoundland: Doyles (AEI), Portland Creek (OTT), Raleigh (AEI), South Branch (OTT); Ontario: Algenquin Province Park (AEI), Brighton (OTT), Dundas (OTT), Innisville (OTT), Kearney (FRA), Midland (OTT), One Sided Lake (OTT), Ottawa (OTT), Picton (OTT), Point Pelee National Park (OTT), Waubamick (ITH); Quebec: Lac Chicobi (OTT), Messines (OTT), Mt. Albert, Gaspesian Park (AEI), Old Chelsea (OTT), Parke Reserve (HOR, OTT), Québec (OTT), Stoneham (AEI); Yukon: Dawson (AEI). USA: California: Alta Meadow, Sequoia National Park, 9000' (ITH); Georgia: Forsyth (HOR, OTT); Maine: Pittston (CAM); Maryland: Takoma Park (AEI); Michigan: Ann Arbor (AEI, NHM, WAH), Banzie Co. (LAN), Gladwin Co. (LAN), Huron Mountains (AEI), Midland Co. (LAN), Oakland Co. (AEI), Waxford Co. (LAN); New Hampshire: Cranford Notch (AEI), Pinkham Notch (AEI), Randolph (AEI); New York: Bemus Point (AEI), Ithaca (AEI), Milford Center (AEI), Oneonta (AEI), Poughkeepsie (AEI, HOR), Troy (AEI); Ohio: Barkcamp State Park (AEI), New Concord (AEI), Steubenville (AEI); South Carolina: Cleveland (AEI); Virginia: Grayson Co. (WAS); Washington: Ashford (AEI), Elbe (AEI). Flight period: vi–ix, with a peak in viii. Probably the species is univoltine.

W: Body length 3.5–4 mm. Temples strongly constricted behind the eyes, 0.8 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum (Fig. 63). Head 1.2 times as wide as high. Ocellar index 2.2. Malar space index 0.8. Glossa 0.5–0.7 times as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.9 times as wide as long, almost flat,

very finely granulate and with dispersed punctures basally, smooth subapically. Face and frons with very fine dispersed punctures on a granulate and dull background, central swelling of face shining. Vertex and temple with very fine dispersed punctures on a finely granulate and shining background. Flagellum with 18–21 segments, filiform, 1st segment 2.3 times, 2nd segment 1.6 times, median segments and the penultimate segment 1.4–1.6 times as long as wide (Fig. 64). Pronotum with fine and dense punctures on a granulate background dorsolaterally, with long striae anteriorly and ventrally. Mesoscutum granulate, rather dull, with fine dispersed punctures. Notaulus as a wrinkled groove, extending to 0.2 the length of the mesoscutum. Prescutellar furrow with fine striae. Scutellum bordered by carinae on the anterior 0.3, finely granulate and with fine punctures. Mesopleurum with distinct and rather dense or dense punctures on a finely granulate background, the central area very finely granulate and shining, without punctures. Foveate groove distinctly depressed, as a row of pits (Fig. 65). Mesosternum finely granulate and with fine dispersed punctures. Metapleurum granulate and dull dorsally and medially, with rather long wrinkles ventrally. Hind leg rather slender, femur 3.8 times as long as high. Pterostigma 2.0 times as long as wide (Fig. 66). Metacarpus reaching to 0.8 of the distance from the radial cell to the tip of the wing. In some specimens the first brachial cell is open at its lower distal corner. Basal keel of propodeum 0.45 times as long as the petiolar area. Lateral area finely granulate and with fine punctures anteriorly, with distinct wrinkles posteriorly and laterally, often with

longitudinal wrinkles beside the basal keel. Petiolar area about 1.2 times as long as wide, flat, granulate and finely rugose or rugose-punctate anteriorly, with transverse wrinkles posteriorly, its boundary rounded or slightly pointed anteriorly (Fig. 67). Propodeal spiracle separated from the pleural carina by 2.5 times its diameter, the spiracular carina partly narrow. 1st gastral tergite 2.9 times as long as wide. Petiole 1.5 times as long as postpetiole, rounded and smooth dorsally, dorsolateral carinae indicated, for the greater part smooth laterally, with distinct glymmae, which are not connected with the ventrolateral furrow of the postpetiole, often with short furrows in front of the glymmae. Postpetiole 1.2 times as long as wide, rounded dorsally, with divergent contours (in dorsal view). 1st sternite reaching the spiracles (Fig. 68). 2nd tergite about 0.9 times as long as wide. Thyridium oval, situated close to the anterior edge of the 2nd tergite, thyridial depression about 1.5 times as long as wide (Fig. 69). Gaster clavate posteriorly. Ovipositor 2.0 times, ovipositor sheath 1.3 times as long as the 1st tergite. Ovipositor slightly bent upwards proximally and medially, distinctly bent upwards distally, with a very shallow rounded dorsal depression subapically, with indistinct teeth ventrally (Fig. 70).

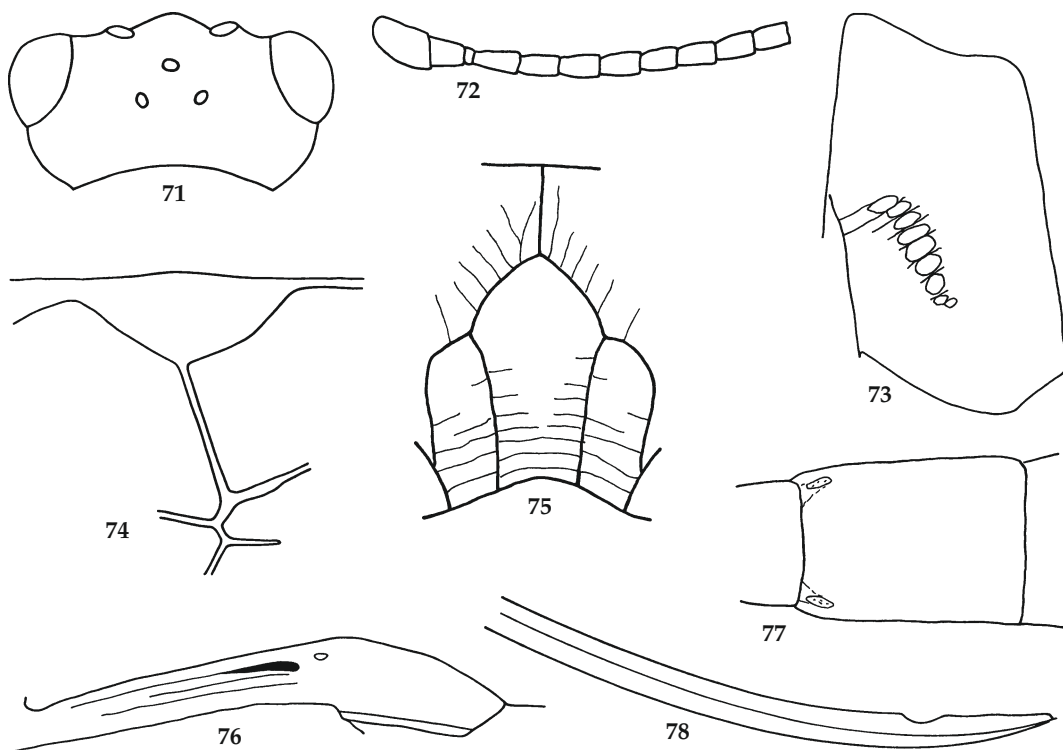
Colour: Head and thorax black, sometimes tinged with brown. Palpi, mandible (teeth light brown), apical half of clypeus, scape, pedicellus, tegula and legs yellowish red. Clypeus sometimes completely yellowish red. Flagellum sometimes yellowish red proximally. Hind coxa sometimes tinged with brown. Pterostigma light brown. 1st gastral segment brown or dark brown, postpetiole sometimes reddish brown. Gaster tergites from the 2nd onwards reddish brown or brown, marked with yellowish red posteriorly and laterally. Pilosity whitish.

M: Flagellum with 19–20 segments, slightly attenuated. 1st gastral tergite 3.5 times, 2nd tergite 1.2 times as long as wide. Glymma often very small. Gaster sometimes almost completely black, only the 2nd tergite marked with brown posteriorly. In other characters similar to the ♀ (also in colour variation).

Diaparsis erythrostoma (Cameron)

W: Body length 4.5–6 mm. Temples distinctly constricted behind the eyes, 0.85 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum or propodeum (Fig. 71). Head 1.2 times as wide as high. Ocellar index 2.9. Malar space index 1.0–1.1. Glossa 0.6 times as long as the width of the clypeus. Oral carina indicated. Upper mandibular tooth distinctly the longer. Clypeus 2.4 times as wide as long, almost flat, smooth, with few

punctures basally. Face and frons finely granulate and with fine dense punctures, central swelling of the face dispersely punctate on a smooth background. Vertex and temple with fine dispersed punctures on a smooth background, median part of vertex finely granulate, outer orbit without punctures. Flagellum with 22–25 segments, filiform, 1st segment 2.4 times, 2nd segment 1.8 times, median segments 1.3 times, penultimate segment 1.1 times as long as wide (Fig. 72). Pronotum very finely granulate and with fine dense punctures laterally, the anterior groove distinctly striate. Mesoscutum with fine and rather dense punctures on a smooth background, the background finely granulate anteriorly. Notaulus as a distinct wrinkled groove, extending to 0.3 the length of the mesoscutum. Prescutellar furrow distinctly striate. Scutellum bordered by carinae on the anterior 0.5, with rather dense punctures on a smooth background. Mesopleurum with distinct rather dense or dense punctures on a smooth background. Foveate groove distinctly depressed, as a long row of pits (Fig. 73). Prepectal carina slightly raised. Mesosternum with fine dispersed punctures on a smooth background. Metapleurum with very dense punctures on a smooth background, with short strong striae dorsally. Hind leg slender, femur 4.4 times as long as high. Pterostigma 2.5 times as long as wide (Fig. 74). Metacarpus reaching to 0.8 of the distance from the radial cell to the tip of the wing. Basal keel of propodeum distinct, 0.4 times as long as the petiolar area. Lateral area with distinct irregular wrinkles. Petiolar area 1.7 times as long as wide, flat, punctate or rugose anteriorly, with distinct transverse wrinkles posteriorly, its boundary rounded or pointed anteriorly (Fig. 75). Propodeal spiracle separated from the pleural carina by 2.5 times its diameter, the spiracular carina narrow. 1st gastral tergite 3.3 times as long as wide. Petiole 1.6 times as long as postpetiole, rounded and smooth dorsally, with weak dorsolateral carinae, with distinct longitudinal striae laterally, the glymmae as small or rather large elongate grooves, which are not connected with the ventrolateral furrow of the postpetiole. Postpetiole 1.3 times as long as wide, rounded dorsally, with slightly divergent contours (in dorsal view). 1st sternite reaching or slightly surpassing the spiracles (Fig. 76). 2nd tergite 1.1 times as long as wide. Thyridium oval, situated close to the anterior edge of the 2nd tergite, thyridial depression about 1.5 times as long as wide (Fig. 77). Gaster clavate and slightly compressed posteriorly. Ovipositor 2.8–2.9 times, ovipositor sheath 1.9–2.0 times as long as the 1st tergite. Ovipositor slightly bent upwards proximally and medially, distinctly bent upwards distally, with a distinct rounded dorsal depression subapically, without teeth ventrally (Fig. 78).



Figs 71–78. *Diaparsis erythrostoma* (Cameron) (♀). 71. Head, top view. 72. Base of antenna. 73. Mesopleurum. 74. Pterostigma and areolet. 75. Propodeum, top view. 76. 1st gastral segment, side view. 77. 2nd gastral tergite, top view. 78. Ovipositor, side view.

Colour: Black. Palpi, glossa, mandible (teeth dark brown), scape and legs yellowish red. Clypeus reddish brown apically. Scape sometimes brown dorsally. Pedicellus sometimes yellowish red. Flagellum dark brown or blackish. Tegula reddish brown. Mid coxa brown basally, hind coxa almost completely brown. Pterostigma dark brown. Gaster behind the 1st tergite reddish brown, the 2nd and 3rd tergites blackish anteriorly, the posterior tergites sometimes marked with brown dorsally. Pilosity whitish.

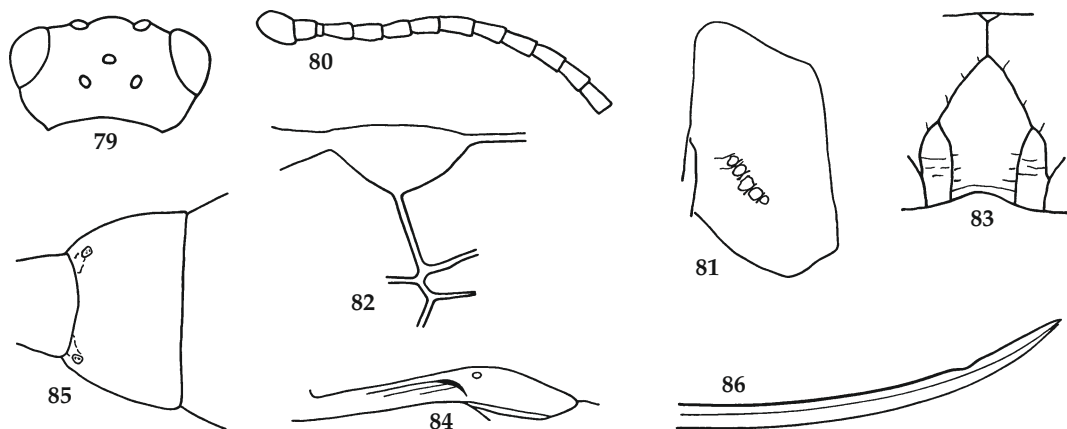
M: Flagellum with 25–27 segments. 1st gastral tergite 5.1 times, 2nd tergite 1.3–1.9 times as long as wide. Posterior gastral tergites marked with brown or black dorsally or completely blackish. In other characters similar to the ♀.

Material (12 ♀♀, 6 ♂♂): Canada: Alberta (HOR, OTT); British Columbia (WAH), Saskatchewan (AEI). USA: California (CAM, OTT); Colorado (HOR, OTT); Montana (AEI); Nevada (NHM, WAS); Oregon (LAN); South Dakota (WAS); Washington (CAM). Flight period vi–viii, with a peak in vii. Probably the species is univoltine. In Colorado, two specimens were collected at about 2700 m a.s.l. (HOR, OTT).

Diaparsis flavipes spec. nov.

Holotype (♀): “Michigan: Washtenaw Co., Ann Arbor, Sept. 1967, Malaise trap, R. W. Carlson” (AEI). – **Para-types** (31 ♀♀, 65 ♂♂): Canada: Ontario: Belleville (OTT), Brighton (OTT), Chatterton (OTT); Quebec: Queen’s Park, Aylmer (OTT). USA: Michigan: Ann Arbor (AEI, HOR, NHM, WAH), Midland Co. (AEI), Saginaw Co. (LAN); New York: Ithaca (AEI, OTT); North Carolina: Cedar Mountains (AEI, HOR); Ohio: New Concord (AEI); Virginia: Blacksburg, 1000 m (AEI); West Virginia: Bowden (AEI); Wisconsin: Jackson Co. (AEI). Flight period ix–x. Probably the species is univoltine.

W: Body length 3–4 mm. Temples strongly constricted behind the eyes, 0.8 times as long as the width of an eye, tangential lines on eyes and temples intersect on the posterior third of the mesoscutum (Fig. 79). Head 1.1 times as wide as high. Ocellar index 2.4. Malar space index 1.0. Glossa about as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.3 times as wide as long, slightly rounded, finely granulate and with distinct rather dense punctures basally, smooth subapically. Face granulate and with fine punctures (sometimes



Figs 79–86. *Diaparsis flavipes* spec. nov. (♀). 79. Head, top view. 80. Base of antenna. 81. Mesopleurum. 82. Pterostigma and areolet. 83. Propodeum, top view. 84. 1st gastral segment, side view. 85. 2nd gastral tergite, top view. 86. Ovipositor, side view.

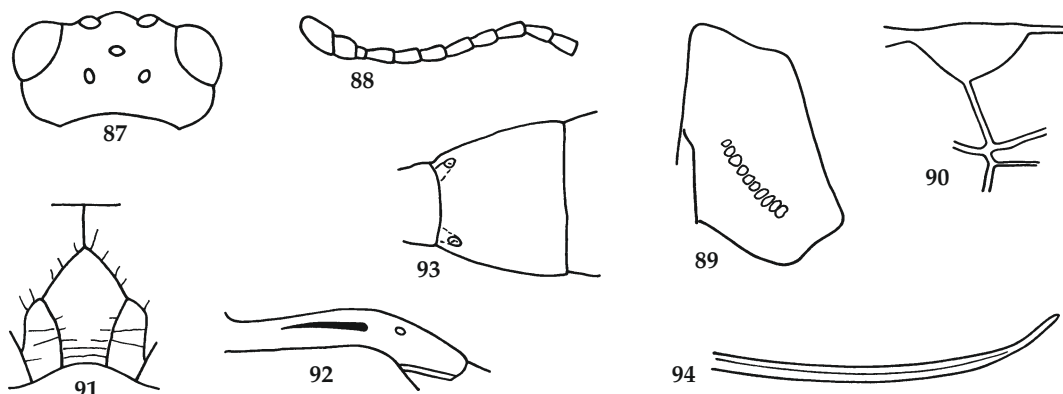
hardly visible), the central swelling almost smooth. Frons and vertex granulate, a fine punctation hardly visible, the vertex more shining. Temple very finely granulate and with very fine and very dispersed punctures. Flagellum with 16–18 segments, fili-form, 1st segment 2.2 times, 2nd segment 1.5 times, median segments and penultimate segment 1.7–1.8 times as long as wide (Fig. 80). Pronotum granulate dorsolaterally, with fine short striae in the anterior groove. Mesoscutum and scutellum granulate, dull, with very fine dispersed punctures (sometimes hardly visible), slightly more shining sublaterally. Notaulus distinct, extending to 0.2 the length of the mesoscutum. Prescutellar furrow with fine striae. Scutellum bordered by carinae on the anterior 0.3. Mesopleurum granulate, for the greater part dull, slightly shining centrally and on the speculum, with fine dispersed punctures (sometimes hardly visible). Foveate groove distinctly depressed, as a rather short row of pits (Fig. 81). Mesosternum finely granulate, shining. Metapleurum granulate, dull. Hind leg slender, femur 4.7 times as long as high. Pterostigma twice as long as wide (Fig. 82). Metacarpus reaching to 0.6 of the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.3 times as long as the petiolar area, distinct. Lateral area granulate, dull, with a few short wrinkles at the boundaries. Petiolar area 1.5 times as long as wide, pointed anteriorly, flat, granulate, with short wrinkles laterally (Fig. 83). Propodeal spiracle separated from the pleural carina by 1.5 times its diameter, the spiracular carina narrow. 1st gastral tergite 2.3 times as long as wide. Petiole 1.5 times as long as postpetiole, smooth and rounded dorsally, sometimes with a small depression posteriorly, with dorsolateral

carinae, with fine sculpture or a few fine striae laterally, the glymmae rather small, close to the end of the petiole, weakly connected with the ventrolateral furrow of the postpetiole. Postpetiole about as long as wide, rounded dorsally, smooth, with divergent contours (in dorsal view). 1st sternite not reaching the spiracles (Fig. 84). 2nd tergite 0.6 times as long as wide. Thyridium circular, close to the anterior edge of the 2nd tergite, thyridial depression indistinct, broader than long (Fig. 85). Gaster slightly clavate posteriorly. Ovipositor 3.2 times, ovipositor sheath 2.4 times as long as the 1st tergite. Ovipositor slender, distinctly bent upwards over its total length, with a very shallow rounded dorsal depression subapically, without teeth ventrally (Fig. 86).

Colour: Head and thorax black, sometimes tinged with dark brown. Palpi, glossa and mandible (teeth brown) whitish yellow. Clypeus brown basally, yellowish red apically. Scape and pedicellus yellowish red. Flagellum brownish black, tinged with yellowish red proximally. Tegula yellowish, hind dorsal corner of pronotum and subtegular ridge tinged with yellowish brown. Pterostigma medium brown. Legs yellowish red. Gaster yellowish red, postpetiole and median tergites tinged with brown, sometimes posterior tergites dark brown too. Pilosity whitish.

M: Flagellum with 18–19 segments, slender. Petiole circular in cross-section, with indistinct dorsolateral carinae. Gaster sometimes completely yellowish red. In other characters similar to the ♀.

Variation: In 1 ♀ and 1 ♂ from Florida (not included in the type series) (WAS) the glossa is not elongate. These specimens might belong to a separate species.



Figs 87–94. *Diaparsis nigrella* spec. nov. (♀). 87. Head, top view. 88. Base of antenna. 89. Mesopleurum. 90. Pterostigma and areolet. 91. Propodeum, top view. 92. 1st gastral segment, side view. 93. 2nd gastral tergite, top view. 94. Ovipositor, side view.

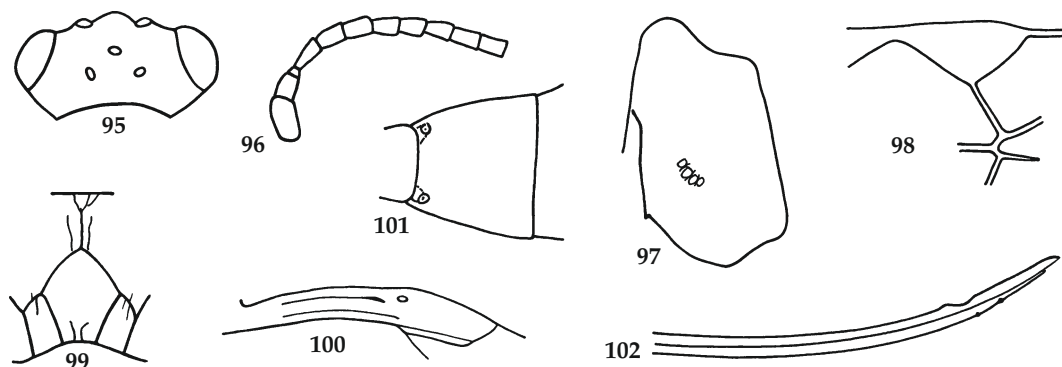
Diaparsis nigrella spec. nov.

Holotype (♀): “Centennial, Wyo., 8-23-51, R. R. Dreisbach” (Wyoming, USA) (AEI).

W: Body length 3.0 mm. Temples distinctly constricted behind the eyes, 0.8 times as long as the width of an eye, tangential lines on eyes and temples intersect on the propodeum (Fig. 87). Head rather narrow, 1.05 times as wide as high. Ocellar index 2.5. Malar space index 0.85. Glossa 0.9 times as long as the width of the clypeus. Upper mandibular tooth slightly the longer. Clypeus 2.5 times as wide as long, slightly rounded and with few punctures on a smooth background basally, flat and smooth subapically. Face and frons with fine dispersed punctures on a very finely granulate and shining background, central swelling of face without punctures. Vertex and temple with very fine dispersed punctures on a smooth background, outer orbit without punctures. Flagellum with 17 segments, slightly clavate, 1st segment 2.7 times, 2nd segment 1.7 times, median segments 1.6 times, penultimate segment 1.1 times as long as wide, the last segment enlarged (Fig. 88). Thorax with a smooth background. Pronotum with fine dense punctures dorsolaterally, with fine striae anteriorly and ventrally. Mesoscutum and scutellum with fine dispersed punctures. Notaulus indistinct. Prescutellar furrow with distinct striae. Scutellum bordered by carinae on the anterior 0.4. Mesopleurum with fine rather dense or dispersed punctures, a central area without punctures. Foveate groove distinctly depressed, as a row of pits (Fig. 89). Mesosternum with fine dispersed punctures. Metapleurum with fine rather dense punctures. Hind leg rather stout, femur 3.6 times as long as high. Pterostigma 2.2 times as long as wide (Fig. 90). Metacarpus reaching

to 0.4 of the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.45 times as long as the petiolar area, fine and complete. Lateral area with fine dispersed punctures on a smooth background, with short wrinkles at the edges. Petiolar area 1.4 times as long as wide, flat, finely rugose and rugose-punctate anteriorly, with fine transverse wrinkles posteriorly, its boundary rounded anteriorly (Fig. 91). Propodeal spiracle separated from the pleural carina by 2.5 times its diameter, the spiracular carina rather narrow. 1st gastral tergite 2.7 times as long as wide. Petiole 1.7 times as long as postpetiole, almost flat and smooth dorsally, with weak dorsolateral carinae, for the greater part smooth laterally, the glymmae as distinct elongate grooves, situated close to the posterior end of the petiole, not connected with the ventrolateral furrow of the postpetiole. Postpetiole as long as wide, smooth and rounded dorsally, with divergent contours (in dorsal view). 1st sternite slightly surpassing the spiracles (Fig. 92). 2nd tergite 0.7 times as long as wide. Thyridium small, circular, situated close to the anterior edge of the 2nd tergite, thyridial depression weak, about 1.5 times as long as wide (Fig. 93). Gaster clavate posteriorly. Ovipositor 3.9 times, ovipositor sheath 2.8 times as long as the 1st tergite. Ovipositor slender, slightly bent upwards proximally and medially, distinctly narrowed and distinctly bent upwards distally, without dorsal depression or teeth (Fig. 94).

Colour: Black. Palpi, mandibles (teeth light brown), apical half of clypeus, scape, pedicellus, tegula and the greater part of the legs yellowish red. Flagellum tinged with yellowish red proximally, dark brown medially and distally. All coxae and the mid and hind trochanters light brown. Pterostigma light brown. Posterior gastral tergites from the 3rd



Figs 95–102. *Diaparsis opaca* spec. nov. (♀). 95. Head, top view. 96. Base of antenna. 97. Mesopleurum. 98. Pterostigma and areolet. 99. Propodeum, top view. 100. 1st gastral segment, side view. 101. 2nd gastral tergite, top view. 102. Ovipositor, side view.

tergite onwards narrowly tinged with yellowish posteriorly. Pilosity whitish.

M unknown.

Diaparsis opaca spec. nov.

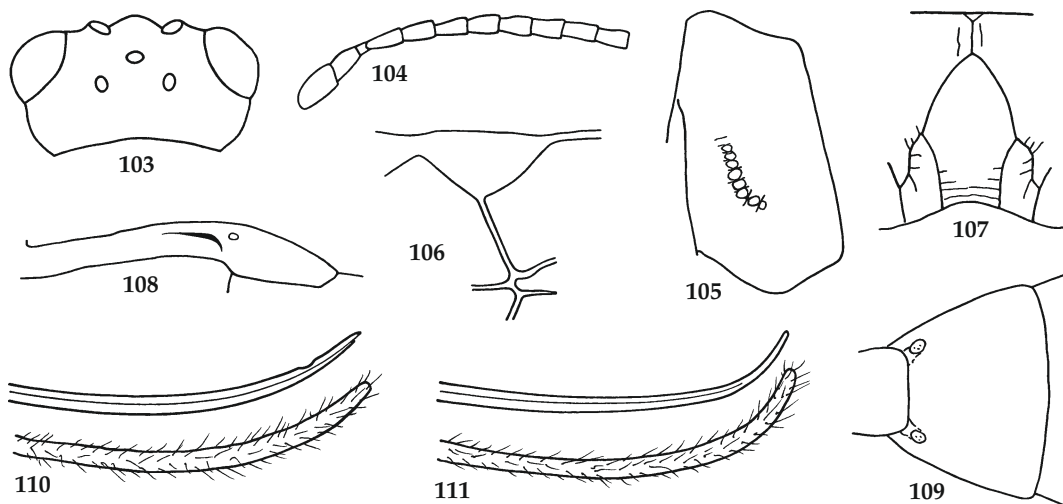
Holotype (♀): "Williamsville, MO., V.1969, J. T. Becker, Malaise trap" (Missouri, USA) (OTT).

W: Body length 3.1 mm. Temples strongly constricted behind the eyes, 0.7 times as long as the width of an eye, tangential lines on eyes and temples intersect on the anterior half of the mesoscutum (Fig. 95). Head rather wide, 1.3 times as wide as high. Ocellar index 3.3. Malar space index 0.9. Glossa 0.3 times as long as the width of the clypeus. Upper mandibular tooth slightly the longer. Clypeus rather short and wide, 0.65 times as long as the face, 3.1 times as wide as long, slightly rounded, finely granulate and with few fine punctures basally, smooth subapically. Head distinctly granulate, dull, no punctuation discernible. Flagellum with 18 segments, filiform, 1st segment 2.2 times, 2nd segment 1.3 times, median segments and the penultimate segment 1.4 times as long as wide, the last segment elongate (Fig. 96). Pronotum granulate and dull laterally, with short striae in the anterior groove. Mesoscutum, scutellum, mesosternum and metapleurum granulate, dull. Notaulus obliterated. Prescutellar furrow with a few fine striae. Scutellum bordered by carinae on the anterior 0.3. Mesopleurum granulate and dull, the granulation coarse centrally. Foveate groove as a short row of pits (Fig. 97). Hind leg slender, femur 4.6 times as long as high. Pterostigma twice as long as wide (Fig. 98). Metacarpus reaching to 0.4 of the distance from the radial cell to the tip of the wing.

Basal keel of propodeum 0.6 times as long as the petiolar area, fine and indistinct, partly covered with wrinkles. Lateral area granulate, with some wrinkles beside the basal keel. Petiolar area 1.2 times as long as wide, flat, granulate, with a few short wrinkles laterally, its boundary rounded anteriorly (Fig. 99). Propodeal spiracle separated from the pleural carina by its diameter, the spiracular carina broad. 1st gastral tergite 3.1 times as long as wide. Petiole 1.75 times as long as postpetiole, almost circular in cross-section, with fine longitudinal striae dorsally and laterally, with indistinct dorsolateral carinae, glymmae obliterated. Postpetiole 1.1 times as long as wide, rounded dorsally, very finely granulate, with slightly divergent contours (in dorsal view). 1st sternite surpassing the spiracles (Fig. 100). 2nd tergite 0.8 times as long as wide. Thyridium circular, situated close to the anterior edge of the 2nd tergite, thyridial depression indistinct, broader than long (Fig. 101). Gaster slightly clavate posteriorly. Ovipositor 3.0 times, ovipositor sheath 2.0 times as long as the 1st tergite. Ovipositor slender, slightly bent upwards proximally and medially, distinctly bent upwards distally, with a shallow rounded dorsal depression subapically, with an indistinct tooth in front of this depression, with two indistinct teeth ventrally (Fig. 102).

Colour: Head, thorax and propodeum blackish, tinged with brown (in particular the propodeum). Palpi, glossa and tegula yellowish. Clypeus reddish brown. Scape, pedicellus, base of flagellum (up to the 6th flagellar segment) and legs yellowish red. Flagellum medium brown medially and distally. Pterostigma light brown. Gaster light reddish brown, the petiole slightly darker. Pilosity whitish.

M unknown.



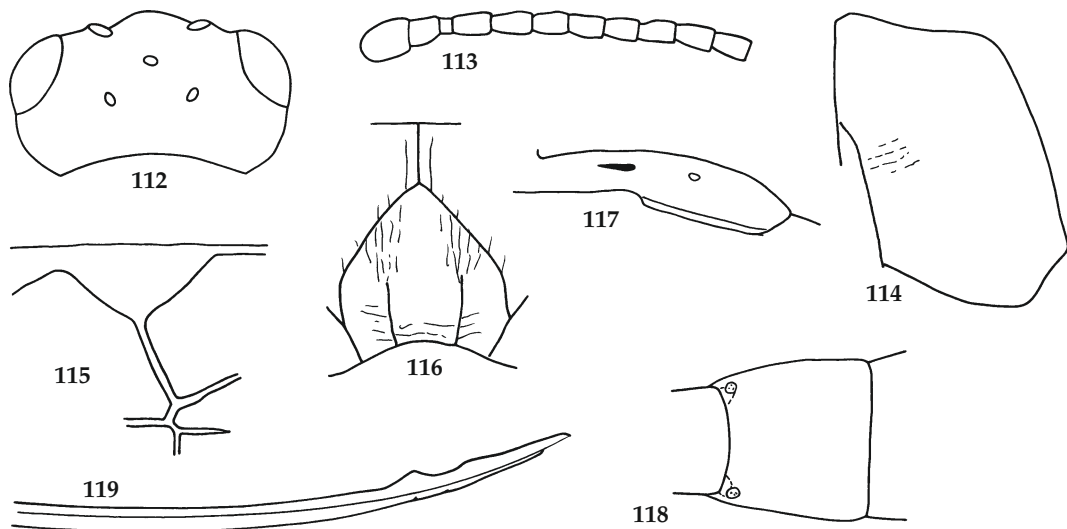
Figs 103–111. *Diaparsis punctata* spec. nov. (♀). 103. Head, top view. 104. Base of antenna. 105. Mesopleurum. 106. Pterostigma and areolet. 107. Propodeum, top view. 108. 1st gastral segment, side view. 109. 2nd gastral tergite, top view. 110–111. Ovipositor and ovipositor sheath, side view.

***Diaparsis punctata* spec. nov.**

Holotype (♀): “Portal, Arizona, Sept. 12, 1987, H. & M. Townes” (AED). – **Paratypes**: 8 ♀♀, 1 ♂ from the same locality (AEI, HOR). Flight period: ix.

W: Body length 3–4 mm. Temples distinctly constricted behind the eyes, 0.8 times as long as the width of an eye, tangential lines on eyes and temples intersect on the propodeum (Fig. 103). Head 1.1 times as wide as high. Ratio of the shortest distance between the inner margins of the eyes to the longest distance between the outer contours of the eyes 0.5. Ocellar index 2.0. Malar space index 0.65. Glossa 1.2 times as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.9 times as wide as long, slightly rounded, with dispersed punctures on a smooth background basally, smooth medially and subapically. Face and frons very finely granulate and with fine dispersed punctures, central swelling of the face smooth. Vertex and temple with very fine and very dispersed punctures on a smooth background. Flagellum with 18–19 segments, slightly clavate, 1st segment 2.4 times, 2nd segment 1.4 times, median segments 1.5 times, penultimate segment 1.1 times as long as wide, the last segment slightly enlarged (Fig. 104). Pronotum very finely granulate and with distinct dense punctures dorsolaterally, with long fine striae anteriorly and ventrally. Mesoscutum with fine dense punctures on a smooth background, sometimes very finely granulate laterally and posteriorly. Notaulus as a wrinkled groove, extending to 0.2 the length of the mesoscutum, sometimes indistinct. Prescutel-

lar furrow with distinct striae. Scutellum bordered by carinae on the anterior 0.3, with rather dense punctures on a smooth background. Mesopleurum with distinct rather dense or dense punctures on a smooth background, a small central area without punctures. Foveate groove as a distinctly depressed row of pits (Fig. 105). Mesosternum with fine rather dense or dense punctures on a smooth background. Metapleurum finely granulate and with fine dense punctures. Hind leg rather slender, femur 3.9 times as long as high. Pterostigma 2.1 times as long as wide (Fig. 106). Metacarpus reaching half the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.3 times as long as the petiolar area, distinct. Lateral area with distinct rather dense or dense punctures on a smooth background. Petiolar area 1.5 times as long as wide, pointed anteriorly, flat, finely granulate and with fine rather dense punctures anteriorly, with fine transverse striae posteriorly (Fig. 107). Propodeal spiracle separated from the pleural carina by 1.5 times its diameter, the spiracular carina broad. 1st gastral tergite 2.9 times as long as wide. Petiole 1.4 times as long as postpetiole, almost circular in cross-section, smooth dorsally and laterally, with indistinct dorsolateral carinae, the glymmae small or obliterated, not or indistinctly connected with the ventrolateral furrow of the postpetiole. Postpetiole 1.2 times as long as wide, rounded dorsally, smooth, with divergent contours (in dorsal view). 1st sternite reaching the spiracles (Fig. 108). 2nd tergite 0.9 times as long as wide. Thyridium oval, situated close to the anterior edge of the 2nd tergite, thyridial depression slightly



Figs 112–119. *Diaparsis splendens* spec. nov. (♀). 112. Head, top view. 113. Base of antenna. 114. Mesopleurum. 115. Pterostigma and areolet. 116. Propodeum, top view. 117. 1st gastral segment, side view. 118. 2nd gastral tergite, top view. 119. Ovipositor, side view.

longer than wide (Fig. 109). Gaster clavate posteriorly. Ovipositor 2.5 times, ovipositor sheath 1.5 times as long as the 1st tergite. Ovipositor slender, slightly bent upwards proximally and medially, either distinctly bent upwards distally, evenly tapered, with a shallow rounded dorsal depression subapically, without teeth ventrally (holotype and six paratypes) (Fig. 110), or strongly narrowed and strongly bent upwards subapically, without depression or teeth (two paratypes) (Fig. 111).

Colour: Head and thorax black. Palpi, glossa, mandible (teeth medium brown), apical half of clypeus, scape, pedicellus, tegula and legs yellowish red. Flagellum dark brown, tinged with light brown basally. Coxae blackish, sometimes yellowish red apically. Trochanters often marked with dark brown. Hind femur sometimes marked with dark brown medially. Pterostigma dark brown. 1st gastral segment dark brown or reddish brown. Median tergites yellowish red, marked with dark brown anteriorly (to a variable extent). Posterior tergites yellowish. Pilosity whitish.

M: Flagellum filiform, median segments and the penultimate segment 1.6–1.7 times as long as wide, the last segment slender. Notaulus as a distinctly wrinkled groove, extending to 0.3 the length of the mesoscutum. 1st gastral tergite 4.0 times, 2nd tergite 1.4 times as long as wide. Glymma as a small elongate groove. Thyridium oval, distant from the anterior edge of the 2nd tergite, thyridial depression indistinct, about 2.5 times as long as wide. Gaster rather dark,

1st segment dark brown, 2nd tergite medium brown, marked with yellowish posteriorly, the following tergites dark brown, marked with yellowish red posteriorly and laterally. In other characters similar to the ♀.

Diaparsis splendens spec. nov.

Holotype (♀): “Potrero, S. D. Co., IV. 15.74, Calif., H. & M. Townes” (San Diego Co., California, USA) (AEI). – Paratypes: 2 ♀♀, 2 ♂♂ with the same dates (AEI, HOR).

W: Body length 3.5–4 mm. Temples distinctly constricted behind the eyes, 0.9 times as long as the width of an eye, tangential lines on eyes and temples intersect on the propodeum (Fig. 112). Head rather wide, 1.3 times as wide as high. Ocellar index 2.9. Malar space index 0.7. Glossa 0.3 times as long as the width of the clypeus. Upper mandibular tooth slightly the longer. Clypeus 3.0 times as wide as long, slightly rounded, smooth, with a few punctures. Face very finely granulate and with fine dispersed punctures, shining, the central swelling smooth. Frons finely granulate and with fine dispersed punctures. Vertex and temple with very fine dispersed punctures on a smooth background. Flagellum with 17 segments, slightly clavate, 1st segment 2.0 times, 2nd segment 1.4 times, median segments 1.1 times, penultimate segment 1.0 times as long as wide (Fig. 113). Pronotum with fine dispersed or rather dense punctures on a smooth background dorsolaterally, with rather

long striae in the anterior groove. Mesoscutum very finely granulate and with fine dispersed punctures, with a smooth background centrally and sublaterally. Notaulus weakly indicated. Prescutellar furrow with fine striae. Scutellum bordered by carinae on the anterior 0.2, with fine dispersed punctures on a smooth background. Mesopleurum with fine dispersed punctures on a smooth background, a small area on the speculum without punctures. Foveate groove as a shallow depression, without wrinkles or pits, sometimes with some very fine striae (Fig. 114). Mesosternum with fine dispersed punctures on a smooth background. Metapleurum with very fine dispersed punctures on a smooth background. Hind leg rather stout, femur 3.8 times as long as high. Pterostigma 2.0 times as long as wide (Fig. 115). Metacarpus reaching half the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.3–0.5 times as long as the petiolar area, fine. Lateral area finely granulate and with fine dispersed punctures, sometimes with fine longitudinal wrinkles posteriorly and beside the basal keel. Petiolar area about 1.6 times as long as wide, almost pointed anteriorly, flat, finely granulate and/or with very fine wrinkles, the lateral carinae replaced by several wrinkles anteriorly (Fig. 116). Propodeal spiracle separated from the pleural carina by 1.5 times its diameter, the spiracular carina narrow. 1st gastral tergite 2.1 times as long as wide. Petiole 1.4 times as long as postpetiole, slightly broader than high, smooth and rounded dorsally, without dorsolateral carinae, smooth or with a few fine striae laterally, the glymmae as oval grooves, not connected with the ventrolateral furrow of the postpetiole. Postpetiole 1.2 times as long as wide, rounded dorsally, smooth, with divergent contours (in dorsal view). 1st sternite not reaching the spiracles (Fig. 117). 2nd tergite about 0.75 times as long as wide. Thyridium indistinct, small, circular, situated at the anterior edge of the 2nd tergite, thyridial depression broader than long (Fig. 118). Gaster slightly clavate posteriorly. Ovipositor 3.7 times, ovipositor sheath 2.5 times as long as the 1st tergite. Ovipositor slender, slightly bent upwards proximally, distinctly bent upwards distally, its tip with a tooth and a rounded depression dorsally, with two indistinct teeth ventrally (Fig. 119).

Colour: Head and thorax black. Palpi, mandible (teeth light brown), apical half of clypeus, scape, pedicellus, proximal part of flagellum (up to the 5th segment), tegula and greater part of legs yellowish red. Flagellum medium brown distally. Front and mid coxae brown basally, hind coxa for the greater part brownish black. Hind femur tinged with brown. Pterostigma medium brown. Gaster brownish black. Pilosity whitish.

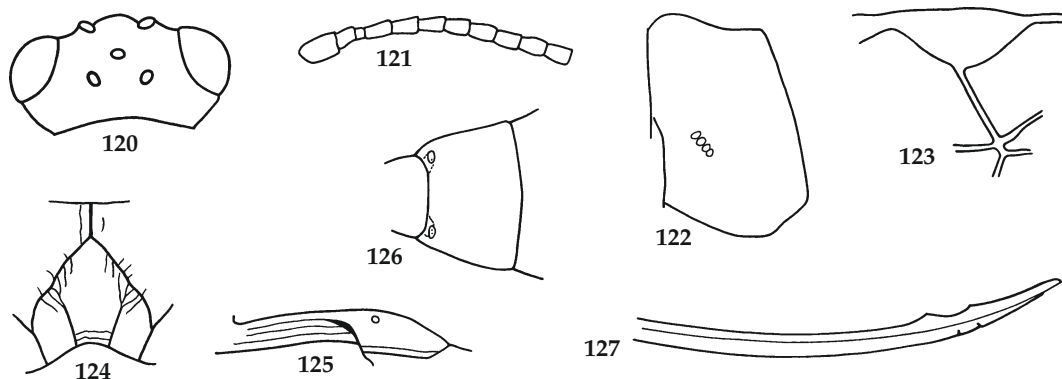
M: Flagellum with 18 segments, weakly clavate. Lateral boundaries of the petiolar area of propodeum sometimes complete. 1st gastral tergite 2.9 times, 2nd tergite 0.8 times as long as wide. In other characters very similar to the ♀.

Variation: In 2 ♂♂ from Los Angeles Co., California (not included in the type series) (WAS) the foveate groove is distinctly striate (but not depressed), and the petiolar area of propodeum is bordered laterally by distinct carinae.

Diaparsis striata spec. nov.

Holotype (♀): "Bowden, W. Va., May 7–9, 1993, B. & C. Dasch trap" (West Virginia, USA) (AEI).

W: Body length 3 mm. Temples distinctly constricted behind the eyes, 0.75 times as long as the width of an eye, tangential lines on eyes and temples intersect on the scutellum (Fig. 120). Head 1.2 times as wide as high. Ocellar index 2.0. Malar space index 1.0. Glossa half as long as the width of the clypeus. Upper mandibular tooth slightly the longer. Clypeus 2.7 times as wide as long, slightly rounded, finely granulate and with few punctures basally, smooth subapically. Face, frons, vertex and temple finely granulate, rather dull. Temple partly shining, a very fine punctation hardly visible. Flagellum with 15 segments, very slightly clavate, 1st segment 2.0 times, 2nd segment 1.6 times, median segments 1.3 times, penultimate segment 1.1 times as long as wide (Fig. 121). Pronotum granulate dorsolaterally, with a few fine striae anteriorly. Mesoscutum and scutellum granulate, rather dull. Notaulus very shallowly depressed. Prescutellar furrow granulate. Scutellum bordered by carinae on the anterior 0.2. Mesopleurum finely granulate, speculum partly shining. Foveate groove as a short row of pits (Fig. 122). Mesosternum finely granulate and with very fine dispersed punctures, shining. Metapleurum granulate. Hind leg slender, femur 4.5 times as long as high. Pterostigma 1.9 times as long as wide (Fig. 123). Metacarpus reaching half the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.4 times as long as the petiolar area, distinct. Lateral area finely granulate, slightly shining, with fine longitudinal wrinkles beside the basal keel. Petiolar area about 1.4 times as long as wide, pointed anteriorly, flat, finely granulate and with very fine wrinkles anteriorly, with a few fine transverse wrinkles posteriorly, its lateral boundaries distinct posteriorly, replaced by several wrinkles anteriorly (Fig. 124). Propodeal spiracle separated from the pleural carina by 1.5 times its diameter, the spiracular carina broad. 1st gastral tergite 2.2 times as long as wide. Petiole



Figs 120–127. *Diaparsis striata* spec. nov. (♀). 120. Head, top view. 121. Base of antenna. 122. Mesopleurum. 123. Pterostigma and areolet. 124. Propodeum, top view. 125. 1st gastral segment, side view. 126. 2nd gastral tergite, top view. 127. Ovipositor, side view.

1.8 times as long as postpetiole, slightly rounded and with very fine striae dorsally, with weak dorsolateral carinae, completely and distinctly striate laterally, the glymmae at the posterior end, distinctly connected with the ventrolateral furrow of the postpetiole. Postpetiole 0.8 times as long as wide, rounded dorsally, very finely striate and granulate-strigose anteriorly, with a small depression centrally, with divergent contours (in dorsal view). 1st sternite almost reaching the spiracles (Fig. 125). 2nd tergite half as long as wide. Thyridium small, broader than long, situated at the anterior edge of the 2nd tergite, thyridial depression broader than long (Fig. 126). Gaster clavate posteriorly. Gastral tergites incised posteriorly from the 6th tergite onwards. Ovipositor 2.3 times, ovipositor sheath 1.5 times as long as the 1st tergite. Ovipositor comparatively stout, slightly bent upwards proximally and medially, distinctly bent upwards distally, its tip with a rounded depression between two indistinct teeth dorsally and with two fine teeth ventrally (Fig. 127).

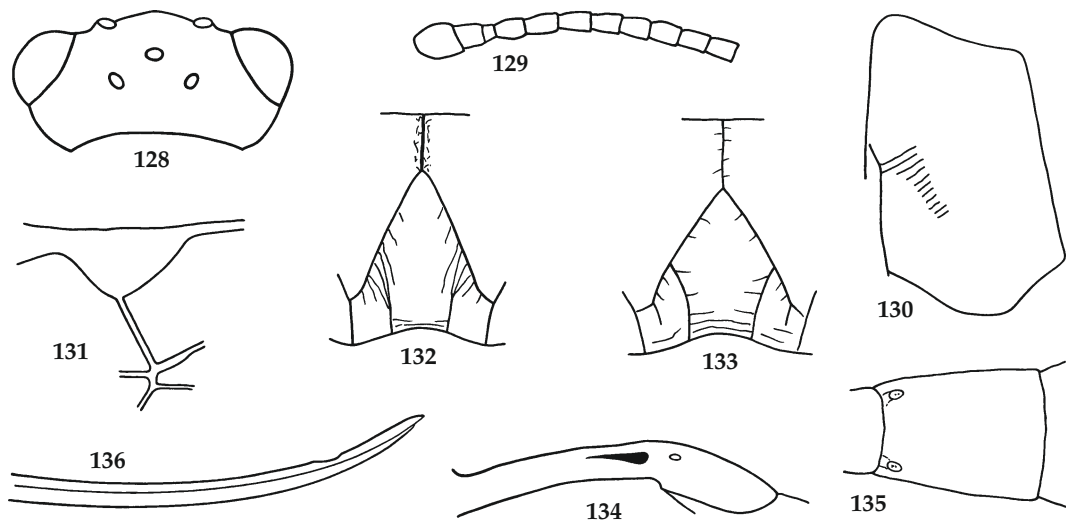
Colour: Black. Palpi, mandible (teeth light brown), scape, pedicellus, tegula and legs yellowish or yellowish red. Flagellum dark brown, its base tinged with yellowish brown ventrally. Hind coxa tinged with brown dorsally. Pterostigma light brown. Postpetiole tinged with brown. 2nd gastral tergite reddish brown, the following tergites yellowish red, the 3rd to 5th tergites marked with dark brown dorsally. Pilosity whitish.

M unknown.

Variation: In 2 ♀♀ from Kansas (not regarded as paratypes) (WAH) the petiole is not completely striate laterally, and the ovipositor is about twice as long as the 1st gastral tergite. These specimens might belong to a separate species.

Diaparsis temporalis Horstmann

W: Body length 3–4 mm. Temples distinctly constricted behind the eyes, 0.7 times as long as the width of an eye, tangential lines on eyes and temples intersect on the prescutellar furrow (Fig. 128). Head 1.2 times as wide as high. Ocellar index 2.3. Malar space index 0.7. Glossa 0.6 times as long as the width of the clypeus. Upper mandibular tooth distinctly the longer. Clypeus 2.9 times as wide as long, slightly rounded, finely granulate and with strong dispersed punctures basally, smooth subapically. Face and frons with fine dense punctures on a distinctly granulate and dull background, central swelling of face somewhat shining. Vertex with fine rather dense punctures on a distinctly granulate background medially. Lateral part of the vertex and temple with fine dispersed punctures on a very finely granulate or smooth background. Flagellum with 25–26 segments, stout, slightly attenuated, 1st segment 1.85 times, 2nd segment 1.25 times, median segments and penultimate segment 1.25–1.3 times as long as wide (Fig. 129). Pronotum with fine very dense punctures on a granulate background dorsolaterally, with fine striae anteriorly. Mesoscutum with fine rather dense punctures on a granulate and dull background, slightly shining sublaterally. Notaulus hardly indicated. Prescutellar furrow with very fine striae. Scutellum bordered by carinae on the anterior 0.3, granulate and with fine rather dense punctures. Mesopleurum distinctly granulate, dull, with fine rather dense or dispersed punctures, speculum slightly shining. Foveate groove as a shallow furrow, with transverse striae, sometimes with a few pits (Fig. 130). Mesosternum finely granulate and with fine dispersed punctures, shining. Metapleurum granulate and dull, punctation not visible. Hind leg



Figs 128–136. *Diaparsis temporalis* Horstmann (♀). 128. Head, top view. 129. Base of antenna. 130. Mesopleurum. 131. Pterostigma and areolet. 132–133. Propodeum, top view. 134. 1st gastral segment, side view. 135. 2nd gastral tergite, top view. 136. Ovipositor, side view.

stout, femur 3.8 times as long as high. Pterostigma 2.1 times as long as wide (Fig. 131). Metacarpus reaching half the distance from the radial cell to the tip of the wing. Basal keel of propodeum 0.3–0.4 times as long as the petiolar area, distinct. Lateral area granulate and dull, a very fine punctation hardly or not at all visible. Petiolar area 1.4–1.6 times as long as wide, pointed anteriorly, flat, granulate and with some fine wrinkles anteriorly, with a few fine transverse wrinkles posteriorly, the lateral carinae often partly replaced by several wrinkles, sometimes complete. Transverse carina straight sublaterally (Figs 132, 133). Propodeal spiracle separated from the pleural carina by three times its diameter, the spiracular carina narrow. 1st gastral tergite 3.3 times as long as wide. Petiole 1.4 times as long as postpetiole, broader than high, flat and smooth dorsally, with distinct dorsolateral carinae, for the greater part smooth laterally, the glymmae as elongate grooves, not connected with the ventrolateral furrow of the postpetiole. Postpetiole 1.4 times as long as wide, slightly rounded dorsally, smooth, with a shallow pit centrally, with slightly divergent contours (in dorsal view). 1st sternite almost reaching the spiracles (Fig. 134). 2nd tergite 1.2 times as long as wide. Thyridium oval, close to the anterior edge of the 2nd tergite, thyridial depression indistinct, about 1.5 times as long as wide (Fig. 135). Gaster clavate and slightly compressed posteriorly. Ovipositor 1.5–1.6 times, ovipositor sheath 0.85–0.9 times as long as the 1st tergite. Ovipositor slightly bent upwards proximally, distinctly (but not strongly) bent upwards

distally, with a shallow rounded dorsal depression subapically, without teeth ventrally (Fig. 136).

Colour: Black. Palpi, mandible (teeth dark brown), apical half of clypeus, ventral parts of scape and pedicellus (sometimes indistinctly) and tegula yellowish red. Flagellum sometimes tinged with yellow basally. Coxae and trochanters dark brown or blackish. Front and mid legs from the trochantelli onwards yellowish red. Hind trochantellus reddish. Hind femur reddish brown and tinged with dark brown, or completely dark brown. Hind tibia yellowish red basally and medially, brownish apically. Hind tarsus yellowish red basally, brownish apically (to a variable extent). Pterostigma light brown or medium brown. Gastral tergites from the 2nd tergite onwards with black dorsal marks anteriorly and medially, broadly yellowish red posteriorly and laterally (colour pattern of the subspecies *rufigaster* Horstmann; see below). Pilosity whitish.

M: Flagellum with 26–31 segments, distinctly attenuated, the penultimate segment 1.4 times as long as wide. 1st gastral tergite 4.7 times, 2nd tergite 1.8 times as long as wide. In other characters similar to the ♀. Gaster sometimes marked with dark brown instead of yellowish red.

Taxonomic remarks: From 1964 onwards, parasitoids belonging to the genus *Diaparsis* were reared in several European countries (Sweden, Denmark, England, France, Spain, Portugal, Italy, Austria, Serbia and Romania) from the cereal leaf beetle, *Oulema melanopus* (Linnaeus) (Chrysomelidae), shipped to

the United States and released in Indiana, Michigan, New York, Ohio and West Virginia for biological control of that host (Dysart et al. 1973). At first the parasitoids were determined as *D. carinifer* (Thomson) (Stehr & Haynes 1972, Dysart et al. 1973). Later a second, undescribed species was detected in material reared from that host (Miller 1977, Carlson 1979: 695), which was then described as *D. temporalis* Horstmann (Horstmann 1979). Both species are closely related and may occur at the same localities. Both species were released into the United States, but only the latter became established, in Indiana, Michigan, New York, Ohio, Pennsylvania and West Virginia (Carlson, l. c.; Haynes & Gage 1981: 264).

In Europe, *D. temporalis* was subdivided into two subspecies, *D. t. temporalis* Horstmann from Germany, Belgium, France, Spain and Italy (gaster almost completely black) and *D. t. rufigaster* Horstmann from Austria, Serbia, Macedonia and Ukraine (gaster broadly marked with red; see above) (Horstmann 1979; 1981: 31). Obviously material of both subspecies was shipped to the United States, and in several cases specimens of both subspecies were released together at the same localities (judged from the origin of the material) (Dysart et al. 1973: 155 f.). But neither the released specimens nor the resulting established populations were determined at a subspecific level. One long series of specimens reared from field-collected host larvae at Galien (Berrien Co., Michigan) (HOR) and 1 ♂ reared at Gull Lake (Kalamazoo Co., Michigan) (WAS) belong to *D. t. rufigaster*, but material from other populations was unavailable for study. Therefore, in this paper the subspecific level is not used.

Material (48 ♀♀, 48 ♂♂): USA: Michigan (HOR, WAS). These specimens were reared from field-collected host larvae (see above). Specimens bred in the laboratory are not listed here. No specimen collected outside grain fields was found in the material studied.

Host: *Oulema melanopus* (Linnaeus) (Chrysomelidae). The host and the parasitoid are both univoltine. Larvae of the host feed in spring on leaves of grasses (including wheat and oats), then pupate in earthen cells in the soil. The new adults emerge in early summer, feed on grasses and hibernate away from the soil (e.g. in grain crop stubble or wood piles). The parasitoid females oviposit in the host larvae, the solitary parasitoid larva kills the host in its pupal cell, spins its own cocoon, hibernates in the soil and pupates in early spring. The new adults emerge from the soil about two weeks later (Dysart et al. 1973, Miller 1977, Haynes & Gage 1981).

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