

**A New Species of *Lasioglossum* from Costa Rica
(Hymenoptera: Halictidae)¹**

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ABSTRACT: Females and males of *Lasioglossum* (*Dialictus*) *figueresi*, new species, are described. The female can be distinguished from the similar *Dialictus aeneiventre* by its larger size, the yellowish wings, the distinct mesepisternal striae, and the anterior mesoscutal areolate punctation. Males of the two species are readily distinguished by sternal and genitalic characters.

An unusually large Meso-american solitary sweat bee, *Lasioglossum* (*Dialictus*) *figueresi* (Hymenoptera: Halictidae), is described as a new species from the Meseta Central (San José Province) of Costa Rica. Biological studies on it and the closely related eusocial *L. (D.) aeneiventre* (Friese, 1916) are reported in forthcoming works by Alvaro Wille, Enrique Orozco and W. Wcislo (in prep.). Morphologically, these two species are closely related within *Dialictus*, and are not related to known species groups (G. C. Eickwort, pers. comm.; C. D. Michener, pers. comm.).

The following descriptions are based upon pinned specimens. Characters that distinguish the new species from *L. (D.) aeneiventre* are italicized. Male metasomal sterna and genitalia were cleared in 10% potassium hydroxide and preserved in glycerin. The morphological terminology follows Eickwort (1969) and McGinley (1986), and surface-sculpture terminology follows Harris (1979); comparisons are given relative to *L. aeneiventre* and other *Dialictus* (Friese, 1916; Mitchell, 1960; Eickwort, 1970). Measurements are given as arithmetic means with standard deviations. Undescribed immature stages are preserved in alcohol in the Snow Entomological Museum, University of Kansas; and the American Museum of Natural History.

Lasioglossum (*Dialictus*) *figueresi* Wcislo, new species

Female *L. (D.) figueresi* can be distinguished from other Meso-american *Dialictus* by its large size; the golden-yellow or yellow-brown coloration of the pubescence, wing membrane, veins and stigma; the deep mesoscutal punctures; and the striate mesepisternum. Males can be distinguished by a combination of these and by genitalic characters.

FEMALE: Length 7.2-9.0 mm; FW length 6.3-6.8 mm ($\bar{x} = 6.61 \pm 0.130$, $n = 15$).

STRUCTURE: Head: Head width 2.0-2.4 mm ($\bar{x} = 2.21 \pm 0.086$, $n = 15$); head length 1.7-2.1 ($\bar{x} = 1.95 \pm 0.113$, $n = 15$). Head about 1.1-1.3 times as wide as long, about as wide as thorax. Measurements of head of holotype in mm: width 2.28; length 2.02; clypeal length 0.54; lower interorbital distance 1.13; upper interorbital distance 1.26; clypeal-antennal distance 0.36; interantennal distance 0.22; antenocular distance 0.49; interocellar (laterals) distance 0.27; ocellular distance 0.34. Scape reaching lateral ocelli, length 0.99; pedicel slightly longer than wide, length 0.15; flagellomere 1 slightly longer than wide, length 0.14; flagellomeres 2 and 3 wider than long; remaining flagellomeres increasing slightly in lengths distally; terminal flagellomere length 0.26. Gena slightly narrower than eye in lateral view. Supraclypeal area slightly rounded and protuberant in profile, length (to antennal sockets) about equal to greatest width. Clypeal length greater than length of supraclypeal area; apical half of clypeus slightly protuberant below anterior mandibular articulations. Frontal line carinate from slightly below base of antenna to about half the distance from antennal sockets to median ocellus, absent above this point. Lateral ocelli slightly nearer to each other than to compound eyes (as in *aeneiventre*). Compound eyes converging more above than below. Hypostomal length/width = 1.92; hypostomal carina produced as flange bordering proboscideal fossa. Vertex areolate behind ocelli (as on anterior margin of scutum) (mostly punctate in *aeneiventre*); gena shiny, reticulate strigose punctate, merely punctate near eye margin; lower half of clypeus coarsely punctate, somewhat shiny interspaces, upper half and disc of supraclypeal area with small punctures widely separated by dull ground (shiny ground in *aeneiventre*); frons closely punctured, interspaces dull.

Thorax: Median furrow about two-thirds of mesoscutum, deeply impressed anteriorly; parapsidal

¹ This is contribution number 2073 from the Department of Entomology, University of Kansas. Accepted for publication 7 November 1989.

P. limpida (Guenee), *P. lysimachiae* Bird, *P. marginidens* (Guenee), *P. maritima* Bird, *P. nebris* (Guenee), *P. nepheleptena* (Dyar), *P. pterisii* Bird, *P. rutila* (Guenee), *P. sciata* Bird, *P. silphii* Bird, and *P. speciosissima* (Grote and Robinson). Thirteen species are common to both states. Differences in *Papaipema* occurrence between Iowa and Missouri may reflect differences in habitat availability, particularly host plant distribution.

The *Papaipema* moths all have larvae that bore into stems and roots of herbaceous plants (Covell, 1984). Additionally, many species have restricted host plant requirements, and some are limited to a single species of host plant (Forbes, 1954). Certain *Papaipema* species are associated with remnant prairies and may be locally rare (Panzer, 1988). Three remnant-restricted species recovered in this study are *P. baptistiae* (wild indigo borer), *P. impecuniosia* (Helenium borer), and *P. sciata* (Culver's root borer). Other collected species have significant host plant restrictions; for example, *P. arctivorens* (northern burdock borer) and *P. cataphracta* (burdock borer).

Papaipema nebris represented an average of 95.3% of all adult *Papaipema* captured (Table 1). In addition, in 1984 and 1985, 4483 *P. nebris* larvae were sampled from smooth brome grass, giant ragweed, and corn and were reared to adults. Only two larvae, both collected in 1984, were species other than *P. nebris* (however, identification of larvae to species was impossible because of damage to specimens).

In contrast to other *Papaipema* species, *P. nebris* is much more polyphagous, readily feeding on corn and numerous weed species associated with corn agroecosystems in Iowa (Decker, 1930). The predominance of *P. nebris* in samples through this six year study probably reflects the wide availability of suitable habitats for the species. This habitat suitability may include more than the presence of a given host plant. In particular, increased occurrence of *P. nebris* in corn has been attributed to poor weed control, resulting in increased grass density (grasses are favored oviposition sites and hosts for young larvae) (Stinner et al., 1984; Levine, 1985). The strikingly limited abundance of other *Papaipema* species in comparison to *P. nebris* probably reflects reduced availability of habitats for other *Papaipema* species with more restrictive requirements.

The *Papaipema* are native species, limited to North America (Forbes, 1954), whose occurrence and abundance may be greatly influenced by human activities. With *P. nebris* this influence has increased species abundance, but may have reduced the occurrence of other *Papaipema* species. Consequently, the *Papaipema*, particularly those species associated with remnant prairies, may be an important indicator group in evaluating native habitat abundance, diversity, and suitability.

ACKNOWLEDGMENTS: We thank W. S. Craig (University of Missouri—Columbia) for assistance in reviewing the UM—C collection, and H. A. Petersen (Iowa State University) for technical assistance during this study. This is Journal Paper No. J-13092 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Project 2580, and a Contribution from the Missouri Agricultural Experiment Station, Journal Series Number 11,115.

- Browning, J. C. 1952. Phalaenidae (Noctuidae) of central Iowa. M.S. Thesis. Iowa State University, Ames. 129 pp.
- Covell, Jr., C. V. 1984. A field guide to the moths of eastern North America. Houghton Mifflin Co., Boston. 496 pp.
- Decker, G. C. 1930. Corn-boring insects of Iowa with special reference to the stalk borer, *Papaipema nebris* (Gn.) and the four-lined borer, *Luperina stipata* (Morr.). Ph.D. Dissertation. Iowa State University, Ames. 174 pp.
- Forbes, W. T. M. 1954. Lepidoptera of New York and neighboring states. Noctuidae. Part 3. New York Agric. Exp. Stn. Mem. 329.
- Hodges, R. W., T. Dominick, D. R. Davis, D. C. Ferguson, J. C. Franclemont, E. G. Monroe, and J. A. Powell. 1983. Check list of the Lepidoptera of America North of Mexico. E. W. Classey Ltd. and the Wedge Entomological Research Foundation, London. 284 pp.
- Levine, E. 1985. Oviposition by the stalk borer, *Papaipema nebris* (Lepidoptera: Noctuidae), on weeds, plant debris, and cover crops in cage tests. J. Econ. Entomol. 77:167–170.
- Panzer, R. 1988. Managing prairie remnants for insect conservation. Natural Areas J. 8:83–90.
- Rubink, W. L., and D. A. McCartney. 1982. Controlling stalk borer damage in field corn. Ohio Rep. 67:11–13.
- Stinner, B. R., D. A. McCartney, and W. L. Rubink. 1984. Some observations on ecology of the stalk borer (*Papaipema nebris* (Gn.): Noctuidae) in no-tillage corn agroecosystems. J. Georgia Entomol. Soc. 19:228–229.

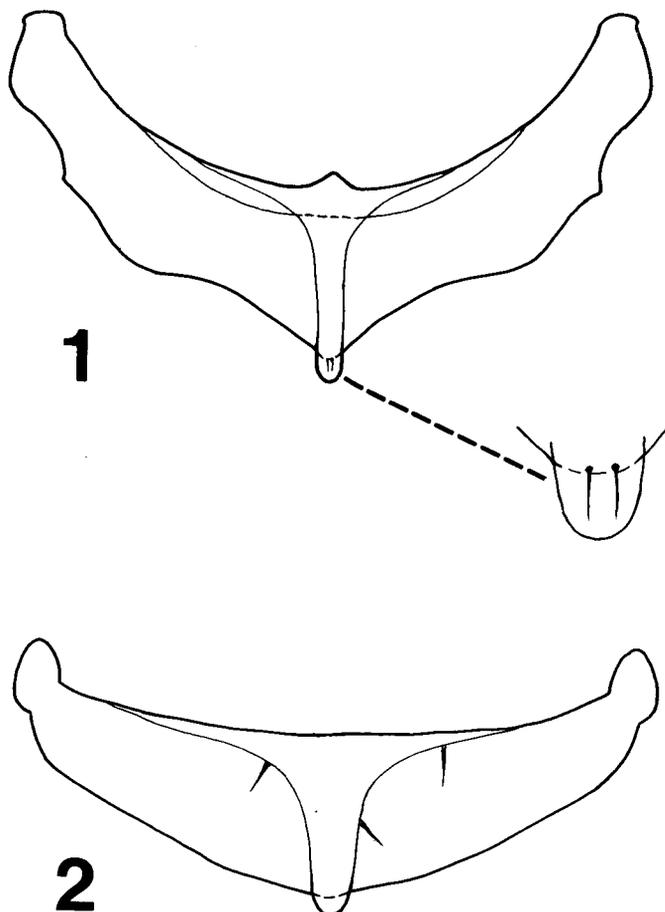


Fig. 1. Dorsal view of male sterna VII and VIII ($\times 128$) of *Lasioglossum figueresi*.

Fig. 2. Dorsal view of male sterna VII and VIII of *Lasioglossum aeneiventre*.

lines reaching anterior tangent of tegulae. *Mesoscutal punctures deep, becoming reticulate (areolate) anteriorly* (in *aeneiventre* becoming more widely separated by more shiny ground). Propodeum reticulate (areolate) on lateral and posterior surfaces (not on dorsal surface), basal area of propodeum shiny, minutely roughened, striated, about 12 striae on each side; striae slightly diverging, medially not reaching rounded posterior margin of area but laterally crossing narrow ridge that delimits side of area and extending into areolate side of propodeum. *Mesepisternum areolate, distinctly striate ventrally, striations not extending to upper portions* (punctate, becoming areolate in *aeneiventre*).

Metasoma: Metasomal terga shiny without distinct punctures.

Wings: Apex of marginal cell narrowly rounded to acute; submarginal cells 2 plus 3 subequal to or slightly longer than cell 1 on posterior margin; second submarginal cell slightly narrowed anteriorly; 1 m-cu meeting 1 r-m basally.

Legs: Fore trochanter shiny and flattened on anterior surface; basitibial plate well-defined with rim raised above surface of plate.

COLORATION: Head and mesosoma metallic dark-green. Lower half of clypeus deep violet black. Antenna dark brown, flagellum light brown underneath beyond segment 3. Tegula brownish black. Wing membrane dull yellow, smokey at tip. *Veins and stigma golden-yellow-brown* (brown in *aeneiventre*). Legs deep brown or blackish brown, small segments of tarsi lighter. Metasoma black.

PUBESCENCE: On head yellowish, sometimes obscuring the surface; on mesosoma abundant, *golden-*

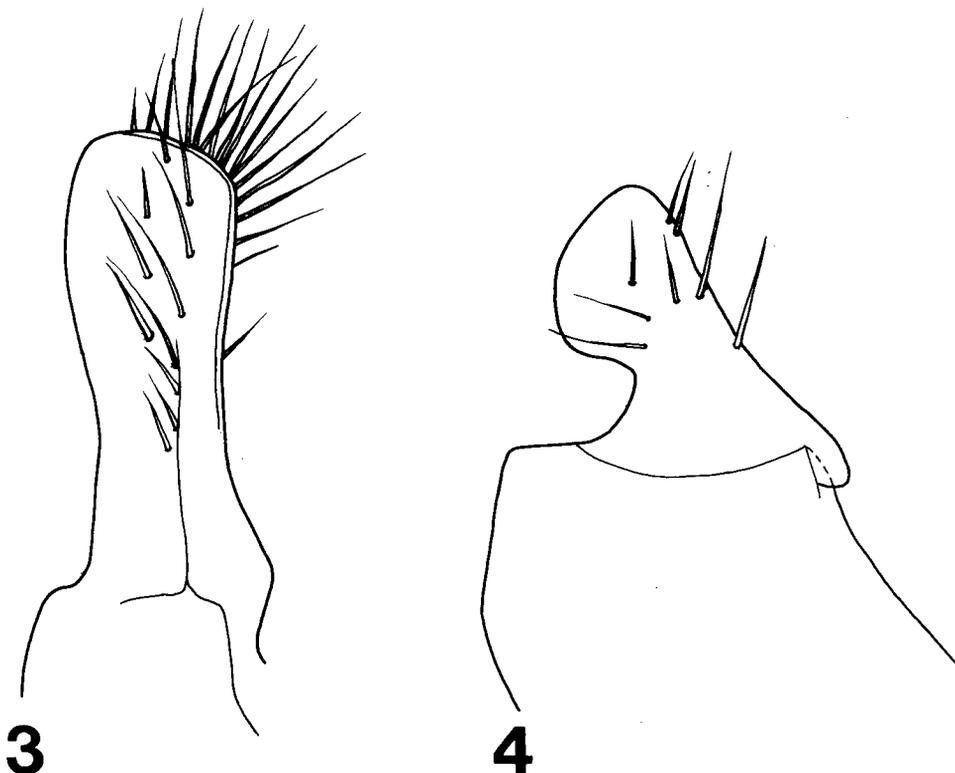


Fig. 3. Dorso-lateral view of male gonostyli (x128) of *Lasioglossum figueresi*.

Fig. 4. Dorso-lateral view of male gonostyli (x128) of *Lasioglossum aeneiventre*.

yellow, becoming slightly sparser dorsally, not obscuring pronotal surface; on metanotum long, plumose, golden, partly obscuring surface; on tegula short, fine yellowish; pronotal lobe rimmed with a dense golden band; on legs testaceous to yellow; on metasomal terga not dense and not obscuring surface, becoming longer laterally and posteriorly; on terga V and VI golden, plumose; pseudopygidial area with yellow-white fringe; metasoma ventrally with long, yellowish plumose hairs on sterna I-V, becoming denser posteriorly (in *aeneiventre* pubescence whiter except on head and dorsum of thorax).

MALE: Agrees with female except for the usual sexual characters and features noted below. Length 5.5–7.3 mm; right forewing length 5.3–6.4 mm ($\bar{x} = 6.01 \pm 0.269$, $n = 15$).

STRUCTURE: Head: Head width 1.7–2.2 mm ($\bar{x} = 2.03 \pm 0.118$, $n = 15$); head length 1.5–2.0 ($\bar{x} = 1.827 \pm 0.122$, $n = 15$); head slightly wider than thorax. Measurements of head of allotype in mm: width 1.98; length 1.86; clypeal length 0.60; lower interorbital distance 0.79; upper interorbital distance 1.21; interantennal distance 0.29; antenocular distance 0.23; ocellocular distance 0.39. Antenna long; scape not reaching median ocellus, length 0.61; pedicel about as long as wide, length 0.12; flagellomere 1 slightly longer than wide, length 0.19; flagellomere 2 about twice length of 1 (slightly less than twice in *aeneiventre*), length 0.38; terminal flagellomere length 0.47. Gena about half as wide to slightly wider than eye in lateral view. Compound eyes converging more strongly below and sinuate relative to female. Vertex and frons coarsely and closely punctate, becoming more sparsely so toward clypeus; clypeal area punctate to areolate-rugulose, shiny.

Thorax: Mesoscutum closely punctate (in *aeneiventre* well separated by dull ground in anterior and median regions); median line deeply impressed; parapsidal line as in female. Striae extending nearly to margin of propodeal area. Mesepisternum areolate, strigose ventrally.

Metasoma: Terga very finely punctate, terga I–IV shiny.

Sterna and genitalia: Sterna VII and VIII as in Fig. 1 (see Fig. 2 for *aeneiventre*). Genitalia similar to other *Dialictus* (e.g., Mitchell, 1960; Eickwort, 1970), but *gonostylus* nearly equal in length to

gonocoxite, shape and position of hairs as in Fig. 3 (in aeneiventre [Fig. 4], gonostylus less than half length of gonocoxite).

COLORATION: Head dark-green; clypeus dark green-purple. Antenna dark brown, lighter beneath. Tegula brownish black; legs as in female. Wings nearly clear, not as yellowish as female, veins nearly brown.

PUBESCENCE: Pubescence yellow to golden-yellow, sparser than female.

HOLOTYPE: Female, COSTA RICA: San José Prov., San Antonio de Escazu, 1–15 April 1985, reared from pupa, W. T. Weislo (Snow Museum, University of Kansas). Allotype: male, same locality data but emerged 19 May 1986.

PARATYPES: 55 males, 60 females; data as above, except dates: specimens collected between December–May 1985, and February–May 1986; one male and one female have been sent to each of the following Museums, except as noted: American Museum of Natural History (New York); Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” (Buenos Aires); British Museum of Natural History (London); Cornell University Insect Collection (Ithaca) (5 females; 5 males); Museo Nacional de Costa Rica (San José) (5 females; 5 males); Museo de Entomología, Universidad de Costa Rica (Ciudad Universitaria); Instituto de Ecología y Sistemática, Academia de Ciencias de Cuba (Ciudad de la Habana); Instituto de Zoología, Universidad Nacional Autónoma de México; Universidade Federal do Paraná (Curitiba) (5 females; 5 males); and National Museum of Natural History, Smithsonian Institution (Washington, D. C.) (5 females; 5 males). The remaining paratypes are in the Snow Entomological Museum, University of Kansas, as are wild-caught females (preserved in alcohol) which are not designated as paratypes.

ETYMOLOGY: The specific epithet of this unusually large *Lasioglossum* (*Dialictus*) is a patronym for José Figueres Ferrer (1906–1990), a Costa Rican patriot (see Guerra, 1987).

ACKNOWLEDGMENTS: I am grateful to Stephen Reyes and especially Charles Michener for their patient help. Their comments, and those of Laurence Packer, and George Eickwort, helped improve the manuscript; Donna Stevens inked the illustrations; and Bill Eberhard first helped find the bees. Financial support for field studies was provided by a Smithsonian Tropical Research Institute Short-term Fellowship; a U.S. National Science Foundation Dissertation Fellowship (BNS 87-01046); Sigma Xi; and the P.L. Stouse Memorial Fund, Department of Geography, University of Kansas. Preparation of the manuscript was partially supported by N.S.F. BNS 87-16817 (C. D. Michener, principal investigator).

Eickwort, G. C. 1969. A comparative morphological study and generic revision of the augochlorine bees (Hymenoptera: Halictidae). Univ. Kansas Sci. Bull. 48:325–524.

Eickwort, G. C. 1970. The identity of *Dialictus umbripennis* in Central America. J. Kansas Entomol. Soc. 43:34–43.

Friese, H. 1916. Zur Bienenfauna von Costa Rica (Hym.). Stett. Entomol. Zeit. 77:287–348.

Guerra, T. 1987. José Figueres, una Vida por la Justicia Social. Heredia, Costa Rica: Centro de Estudios Democráticos de América Latina.

Harris, R. A. 1979. A glossary of surface sculpturing. Occ. Pap. Entomol., Calif. Dept. Food Agricult. 28:1–31.

McGinley, R. J. 1986. Studies of Halictinae (Apoidea: Halictidae), I. Revision of New World *Lasioglossum* Curtis. Smithsonian Contr. Zool. 429:1–294.

Mitchell, T. B. 1960. Bees of the eastern United States. Vol. 1. No. Carolina Exp. Stat., Tech. Bull. 141:1–538.