A Review of *Perdita*, Subgenus *Macrotera* (Hymenoptera: Andrenidae)

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**ABSTRACT.** The taxonomy of the species comprising *Perdita*, subgenus *Macrotera* is reviewed; these bees are oligoleges on *Opuntia* (Cactaceae). A key to the species is given; two new species are described from Mexico: *P. pipiyolirt* from Jalisco and *P. nahua* from Michoacan; new synonymy is proposed: *P. secunda* Cockerell, 1904, and *P. texana ablusa* Timberlake, 1958 = *P. texana* (Cresson, 1878). Appropriate morphological features are illustrated for all species and the known distributions are mapped.

**INTRODUCTION**

*Macrotera*, although originally described as a genus by F. Smith (1853), has long been treated as a subgenus of *Perdita* F. Smith (1853) (e.g., Timberlake, 1954). The few species occur in Mexico and in Texas and New Mexico in the United States. All are presumed oligoleges on *Opuntia* and possibly other Cactaceae. The species were treated by Timberlake (1954, 1958). With the discovery of two additional Mexican species, we deem it appropriate to review the previously described species in addition to describing the new ones.

Species of *Macrotera* are relatively large for *Perdita* (body length up to 10 mm); males have heads that are conspicuously broader than long, with the inner eye margins somewhat divergent below. Although the head is broader than long in females, the disparity is less extreme than in the males. Other features characteristic of *Macrotera* include: glossa of both sexes 2-3 times length of prementum and extending between metacoxae; second segment of maxillary palpus longer than first or any of the following segments; both sexes with well developed facial foveae; second segment of maxillary palpus longer than first or any of the following segments; both sexes with well developed facial foveae; marginal cell of forewing large, at least subequal to first submarginal; stigma slender and tapering; metatibia and basitarsus of male with long, flattened, scale-like hairs; both sexes with basal segment of metatibia; tibial spurs stout and abruptly hooked at apex in both sexes; metasoma of male flattened and broader than mesosoma.

**MATERIALS AND METHODS**

**INSTITUTIONAL COLLECTIONS**

During the course of this review we have studied material from the following collections: Bee Biology and Systematics Laboratory, USDA, Logan, Utah (BBSL); Natural History Museum, London (BMNH); California Academy of Sciences (CAS); Central Texas Melittological Institute, Austin, Texas (CTMI); Natural History Museum of Los Angeles County (LACM); United States National Museum of Natural History (USNM); Universidad Autónoma de México (UNAM); University of California, Berkeley (UCB) and University of California, Riverside (UCR); University of Kansas (UKAN).

**TERMINOLOGY**

In general, the terminology employed here is standard among bee systematists. For a description of puncture sizes and spacing, see Snelling (1985). The following abbreviations are used in the descriptions.

- **HL**—head length: in frontal view, the midline distance between the lower clypeal margin and the summit of the vertex.
- **HW**—head width: in frontal view, the maximum distance across the eyes.
- **IOD**—interocellar distance: the minimum distance between the posterior ocelli.
- **LID**—lower interocular distance: the distance between the inner eye margins at the level of the lateral angle of the clypeus.
- **OD**—ocellus diameter: the transverse diameter of the anterior ocellus.
- **OOD**—ocellocular distance: the minimum distance between either posterior ocellus and the adjacent inner eye margin.
- **OVD**—ocellovertexal distance: with head in frontal view, the minimum distance between either posterior ocellus and the dorsal margin of the vertex.

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Figures 1-5. Frontal views of male heads; (1) P. texana, (2) P. bicolor, (3) P. nahua, (4) P. pipiyolin, (5) P. sinaloana.

TL—total length: the sum of HL + length of mesosoma (from anterior margin of mesoscutum to a point directly above metasomal attachment) + length of metasoma (from point of attachment of mesosoma to farthest extremity).

UID—upper interocular distance: with head in frontal view, the minimum distance between the inner eye margins.

WL—wing length: minimum distance from margin of tegula to extremity of wing tip.

The last visible metasomal sternum of the females is characteristically different for each species. In order to be properly examined, it must first be removed and cleared in KOH. For this reason, we have not used these sterna as key characters, although they are illustrated for each species (Figs. 6-11).

KEY TO SPECIES OF MACROTERA
1a. Male; antenna with 13 segments ........ 2
b. Female; antenna with 12 segments ........ 7
2a. Lower face with clypeus and lateral face marks yellowish (Figs. 2-5) .................. 3
b. Lower face concolorous with remainder of face, distinctly not yellowish (Fig. 1) .... 6
3a. Facial fovea long and narrow (but broader above), about parallel with inner eye margin
Figures 6–11. Ventral views of female S6; (6) P. texana, (7) P. bicolor, (8) P. nahua, (9) P. crassa, (10) P. pipiyolin, (11) P. sinaloana. Scale bar = 0.5 mm.

and upper end separated from eye margin by 0.25 times length of fovea or less; mesoscutal interspaces dull and conspicuously tessellate  4

b. Facial fovea short and relatively broad, strongly oblique to inner eye margin, upper end separated from eye margin by about 0.50 times length of fovea (Fig. 5); mesoscutal interspaces distinctly shiny and very weakly tessellate over most of disc  5

sinaloana Timberlake

4a. Supraclypeal area with distinct impunctate zone along midline; punctures in posteromedian area of mesoscutum and of middle of scutellum mostly separated by a puncture diameter or more  ... bicolor (F. Smith)

b. Supraclypeal area subcontiguously punctate and without impunctate median zone; punctures of mesoscutum and scutellum uniformly subcontiguous  5

sinaloana Timberlake

5a. Extreme base of propodeum roughened but without short longitudinal rugulae; aedeagus without ventral hook-like process (Fig. 21)  ... pipiyolin, new species

b. Extreme base of propodeum roughened and with short longitudinal rugulae; aedeagus with ventral hook-like process (Fig. 22)  ... nahua, new species

6a. Front of head, including clypeus and paraocular area, with conspicuous hairs, many of them distinctly barbulate; subgenital plate (metasomal sternum 7) broad, apex subtruncated (Fig. 13) —*crassa* Timberlake

b. Frons with short, simple hairs, clypeus and paraocular area virtually without hairs other than some exceedingly short, simple hairs on clypeus; subgenital plate narrow, apex narrowly rounded (Fig. 12) — *texana* (Cresson)

7a. Scopal hairs flattened and conspicuously wavy or crinkled —

b. Scopal hairs simple, i.e., long, somewhat flattened and evenly tapering to acute, often curved apices —

8a. Extreme base of propodeum roughened but
without short longitudinal rugae; side of propodeal disc with some hairs at least 0.07 mm long
pipiyolin, new species
b. Extreme base of propodeum roughened and with several short longitudinal rugae on each side of middle; hairs on side of propodeal disc uniformly very short, none over 0.05 mm long
nahua, new species
9a. Propodeal disc with abundant long, conspicuously plumose hairs
b. Propodeal disc bare or with sparse, very short

Figures 18-20. Dorsal, ventral, lateral views of male genital capsule and dorsal and lateral views of the aedeagus; (18) P. texana, (19) P. crassa, (20) P. bicolor. Scale bar = 0.25 mm.

10a. Punctures of clypeal disc subcontiguous, median impunctate line absent or narrow and incomplete; mesoscutum dull and sharply tessellate between punctures
pipiyolin (F. Smith)
11
b. Punctures of clypeal disc very irregularly spaced, median impunctate line broad and often poorly defined, disc sometimes with only scattered punctures; mesoscutum shiny and
weakly tessellate between punctures ........... *crassa* Timberlake

11a. Face between lateral ocelli and upper end of facial foveae slightly shiny, distinctly tessellate between variably spaced, minute punctures, some interspaces several times puncture diameter; middle of scutellum shiny, punctures often separated by several times puncture diameter ............ *texana* (Cresson)

b. Face between lateral ocelli and upper end of facial foveae moderately shiny between mixed minute to fine punctures that are mostly separated by about puncture diameter or less; scutellum slightly shiny between mostly subcontiguous punctures .............

*Perdita* (*Macrotera*) bicolor (F. Smith)

Figures 2, 7, 15, 20, 24, 31, 35

*Macrotera* bicolor F. Smith, 1853:130; ♂.


The male of *P. bicolor* is one of four species with yellow face marks. It differs from *P. sinaloana* by the long, narrow facial foveae that are parallel with the inner eye margins (Fig. 2). From *P. pipiyolin* and *P. nahua*, it differs by the distinctly sparser punctuation of the supraclypeal area and the center of the mesoscutal disc. Both *P. crassa* and *P. texana* lack yellow face marks.

The presence of numerous long, plumose hairs on the propodeal disc will separate the female from all except *P. crassa*. From that species *P. bicolor* differs in the evenly spaced clypeal punctation, but with a distinct impunctate median line, and the dull, densely tessellate mesoscutal interspaces.

Although most females have metasomal terga 2–5 or 3–5 largely reddish, we have seen a few with the entire metasomal dorsum blackish brown. Females of *P. bicolor* have the inner margins of the forecoxae (in ventral view) straight and the inner apical angle abrupt (Fig. 31).

This species is known only from the eastern highlands of Mexico where it has been collected in the States of Hidalgo and Puebla.

**Perdita (Macrotera) crassa** Timberlake

Figures 9, 13, 19, 35

**Perdita (Macrotera) crassa** Timberlake, 1958:375, 376–377; ♀ ♂.

Males of *P. crassa* are easily recognized by the lack of yellowish face marks, the densely punctate supraclypeal area, and the broad, apically subtruncate subgenital plate (Fig. 13). The female shares with *P. bicolor* the presence of numerous long plumose hairs on the propodeal disc, but differs from that species in the very irregular spacing of the clypeal punctures and the smooth, shiny interspaces between mesoscutal punctures.

Although presently known only from Texas, *P. crassa* probably will be found to occur in Mexico, at least in the states of Nuevo León and Coahuila.

**Perdita (Macrotera) nahua**, new species

Figures 3, 8, 17, 22, 28, 29, 33, 35

**DIAGNOSIS**

**FEMALE.** Separable from all *Macrotera* species except *P. pipiyolin* by the distinctly wavy or “crinkled” scopal hairs; differs from *P. pipiyolin* by the...
distinctly rugulose propodeal base and the very short hairs laterad on the propodeal disc; additionally, the metasoma is reddish to largely brown.

**MALE.** Separable from *P. crassa* and *P. texana* by the yellow clypeus and lateral face marks; separable from *P. sinaloana* by the long facial fovea that parallels the inner eye margin; separable from *P. bicolor* by the densely punctate supraclypeal area and the shiny, subcontiguously punctate mesoscutal disc; separable from *P. pipiyolin* by the sharply rugulose propodeal base and the prominent ventral process of the penis valve (Fig. 22).

**DESCRIPTION**

**FEMALE.** Measurements (mm): Holotype HW 2.42; HL 1.84; WL 5.2; TL 8.8. Paratypes: HW 2.23–2.54; HL 1.77–2.00; WL 4.8–5.5; TL 8.1–9.2.

Head about 1.3 times as broad as long; inner eye margins slightly divergent below, LID about 1.03 times UID; vertexal margin evenly convex in frontal view. Facial fovea linear, parallel to inner eye margin and distinctly broader above. IOD about 1.6 times OD; OOD about 2.9 times OD; OVD about equal to OD. Antennal scape extending almost to level of posterior ocelli; first flagellar segment about as long as broad and no longer than second segment. Clypeus shiny, with or without narrow impunctate median line, but most of disc with subcontiguous moderate punctures. Supraclypeal area duller, punctures fine and contiguous to subcontiguous, sometimes sparse along midline; lower parocular area shiny between sparse punctures finer than on clypeus, becoming duller above between minute subcontiguous punctures. Frons dull and sharply tessellate between minute subcontiguous punctures. Vertex dull and tessellate, ocellocular area with minute subcontiguous punctures that grade into coarser, more separated punctures on vertexal summit.

Mesoscutum shiny over most of disc, becoming...
lightly tessellate toward margins, punctures minute to fine, dense, even along mid-line. Scutellum similar, punctures not noticeably sparser in middle. Metanotum dull, densely tessellate, punctures minute and subcontiguous to contiguous. Mesepisternum slightly shiny and roughened between dense fine punctures. Metepisternum shinier, with scattered fine punctures. Propodeum moderately shiny, basal margin narrowly roughened and with short longitudinal rugulae; lateral portions of disc with fine piligerous punctures. Inner margins of procoxae nearly straight, inner apical angle produced and acute (similar to Fig. 30). Tibial spurs stout, apices abruptly hooked; hairs of metatibial scopa long and distinctly wavy or “crinkled”.

Metasoma moderately shiny, terga transversely lineolate, sculpture becoming coarser on succeeding segments, translucent apical margins broad on terga 2–4; punctures ultraminiute to minute, denser on successive segments and laterad on each. Pygidial plate broadly rounded or subtruncate at apex, margins slightly reflexed, disc granulopunctate. Sterna similar to terga but discs more densely punctate; S6 as in Figure 8.

Pilosity normal for Macrotera; mesoscutal hairs suberect to erect, mostly very short but with scattered longer hairs; hairs across middle one-half of metanotum very short, subappressed, and directed cephalad; lateral margins of propodeal disc with inconspicuous hairs less than 0.05 mm long.

Color head and most of mesosoma dark brownish, mesoscutum darker, antenna and legs paler; metasoma reddish to largely reddish brown, segment margins distinctly reddish. Tegula yellowish. Wings clear light brownish, veins mostly yellowish brown, subcosta and stigma darker.

**MALE.** Measurements (mm): HW 2.48–2.97; HL 1.44–2.06; WL 5.0–5.6; TL 7.3–8.4.

Head (Fig. 3) broader than mesosoma, about 1.5 times as broad as long; inner eye margins weakly divergent below, LID about 1.05 times UID; vertexal margin nearly flat across middle one-half in anterior view. Facial foveae about as in female but margins less defined. IOD about 2.0 times OD; OOD 4.8–6.0 times OD; OVD 2.5–2.7 times OD. Antennal scape extending to about level of posterior ocelli; first flagellar segment about as long as wide and slightly longer than second segment. Facial sculpture about as in female but clypeal punctures slightly finer, mostly subcontiguous and median impunctate line very narrow or absent; supraclypeal area with median impunctate line narrow or absent.

Mesosoma as described for female, but punctures of disc of mesoscutellum uniformly subcontiguous in center. Femora, especially metafemur, robust; tibial spurs stout, apices abruptly hooked.
Metasoma, except usual sexual differences, as in female; pygidial plate (Fig. 28, 29) broad, with slightly reflexed margins, apex subtruncate, disc distinctly coarsely rugose. Subgenital plate and genitalia as illustrated (Figs. 17, 22).

Pilosity about as in female except scopa lacking, meso- and metatibiae with widely spaced, long, flat, scale-like hairs.

Color as in female except: mandible, except reddish apex; labrum; clypeus, except small to large mediobasal brown spot; lower paraoacral area, sometimes including stripe along inner margin of eye nearly to summit, all pale yellowish. Protibia yellowish red, metasoma bright reddish.

TYPE MATERIAL
Holotype female: Ziculcan, Michoacán, MEXICO, 8 July 1988 (G. Rodriguez G.), Paratypes: 5 ♀♀, 4 ♂♂, same data as holotype. Holotype in UNAM; paratypes in LACM, UNAM, USNM.

ETYMOLOGY
This species is named for the Nahua people who inhabited central Mexico prior to the Spanish invasion. The name is a noun in apposition.

DISCUSSION
In most respects both sexes of P. nahua are very similar to P. pipiyolin. The prominent, acute ventral process of the male aedeagus, however, will permit ready separation of this species from all other Macrotéra males.

The females of P. nahua, together with those of P. pipiyolin, have a very characteristic scopa in which the scopal hairs have very attenuated apices that are distinctly wavy or crinkled; in all other species the scopal hairs, although often attenuated, are curled apically. These two species are also characterized by their relatively densely punctate clypeus and mesoscutum. The presence of numerous short, longitudinal to oblique rugules across the base of the propodeum will separate females from P. nahua from those of P. pipiyolin, as will the reduced and very short pilosity at the side of the propodeal disc.

Females of this species and of P. pipiyolin often have vein 1m-cu of the forewing joining M beyond Rs (Fig. 33); in the four remaining species of Macrotéra 1m-cu and Rs are interstitial (Fig. 34). Little reliance can be placed on this character of venation because some specimens of P. pipiyolin have the two veins interstitial.

Of the paratype females of P. nahua, one has the entire metasoma bright reddish. In two specimens the terga are largely reddish medially but extensively brownish at the sides. The two remaining females have the metasomal terga mostly dark but with dull reddish margins on segments 1–5.

Although no floral data are provided with these specimens, the pollen in the scopa appears to be that of a cactus species, probably Opuntia.

Perdita (Macrotera) pipiyolin, new species
Figures 4, 10, 14, 21, 26, 30, 35

DIAGNOSIS
FEMALE. Separable from all other species of Macrotera except P. nahua by the wavy or “crinkled” hairs of the metatibial scopa; separable from P. nahua by the weakly roughened propodeal base and the longer hairs laterad on the propodeal disc; P. pipiyolin and P. nahua are both additionally separable from all other species except P. texana by the shiny, densely punctate mesoscutal disc and from P. texana by the presence of conspicuous, though short, hairs laterad on the disc of the propodeum.

MALE. Separable from P. crassa and P. texana by the yellow clypeus and lateral face marks; separable from P. sinoalana by the long facial fovea that parallels the inner eye margin; separable from P. bicolor by the densely punctate supraclypeal area and the shiny, subcontiguously punctate mesoscutal disc; separable from P. nahua by the weakly roughened propodeal base and the lack of a ventral hook-like process on the aedeagus (Fig. 21).

DESCRIPTION
FEMALE. Measurements (mm): Holotype, HW 2.55; HL 2.10; WL 5.9; TL 10.1. Paratypes: HW 2.39–2.65; HL 1.94–2.13; WL 5.2–6.0; TL 9.3–10.2.

Head about 1.2 times as wide as long; inner eye margins slightly divergent below, LID about 1.04 times UID; vertexal margin evenly convex in frontal view. Facial fovea linear, parallel to inner eye margin, distinctly broader at upper end. IOD about 1.6 times OD; OOD about 2.9 times OD; OVD about equal to OD. Antennal scape extending to level of anterior ocellus; first flagellar segment distinctly longer than broad and about twice as long as second segment. Clypeus shiny, with narrow impunctate median line, but most of disc with subcontiguous moderate punctures. Supraclypeal area duller, punctures fine and contiguous to subcontiguous, sometimes sparse along mid-line; lower paraoacral shiny between sparse punctures finer than on clypeus, becoming duller above between minute subcontiguous punctures. Frons dull and sharply tessellate between minute subcontiguous punctures. Vertex dull and tessellate, ocelloculcular area with minute subcontiguous punctures that grade into coarser, more separated punctures of vertexal summit.

Mesoscutum shiny over most of disc, becoming lightly tessellate toward margins, punctures minute to fine, dense, even along mid-line. Scutellum similar, but punctures noticeably sparser in middle. Metanotum dull, densely tessellate, punctures minute and subcontiguous to contiguous. Mesepisternum slightly shiny and rougher between dense fine punctures. Metepisternum shinier, with scattered
fine punctures. Propodeum moderately shiny, basal margin narrowly roughened but without short longitudinal rugulae or punctures; lateral portions of disc with fine piligerous punctures. Inner margin of forecoxa nearly straight, inner apical angle produced and acute (Fig. 30). Tibial spurs stout, with abruptly hooked apices; hairs of metatibial scopa long and distinctly wavy or "crinkled."

Metasoma moderately shiny, terga transversely lineolate, sculpture becoming coarser on succeeding segments, translucent apical margins broad on terga 2–4; punctures ultraminate to minute, denser on successive segments and lateral on each. Pygidial plate broadly rounded or subtruncate at apex, margins slightly reflexed, disc granulopunctate. Sterna similar to terga but discs more densely punctate; S6 as in Figure 10.

Pilosity normal for Macroteora; mesoscutal hairs suberect to erect, mostly very short but with scattered longer hairs; hairs across middle one-half of metanotum very short, suppressed and directed cephalad; lateral margins of propodeal disc pilose, some hairs at least 0.07 mm long, hairs becoming very short mediad. Color of head and most of mesosoma dark brownish, mesoscutum darker, antenna and legs paler; metasoma reddish brown, segment margins paler. Tegula yellowish. Wings clear light brownish, veins mostly yellowish brown, subcosta and stigma darker.

MALE. Measurements (mm): HW 2.32–3.23; HL 1.58–2.13; WL 5.1–5.7; TL 7.9–9.5.

Head (Fig. 4) broader than mesosoma, about 1.5 times as broad as long; inner eye margins weakly divergent below, LID about 1.1 times UID; vertexal margin nearly flat across middle one-half in anterior view. Facial foveae about as in female but margins less defined. IOD 1.5–1.6 times OD; OOD 3.1–4.5 times OD; OVD 2.4–3.0 times OD. Antennal scape extending to about level of posterior ocelli; first flagellar segment about as long as wide and slightly longer than second segment. Facial sculpture about as in female but clypeal punctures slightly finer, labrum; clypeus, except small to large mediobasal brown spot; lower paraclypeal area, including stripe along inner margin of eye nearly to summit, all pale yellowish. Protibia yellowish red. Metasoma dull reddish.

TYPE MATERIAL

Holotype female: Estación Biológica "Chamela", near San Patricio, Jalisco, Mexico, 7 Sept. 1980 (S.H. Bullock), on Opuntia sp. Paratypes (all from Chamela): 5♀, 15♂, same data as holotype; 16♀, 27♂, 10–14 July 1989 (T. Griswold), on O. excelsa (9♀, 15♂) and Lonchocarpus cochleatus (1♀); 2♂, 20 July 1989 (T. Griswold); 1♀, 2♂, 21 July 1986 (R. Ayala), on O. excelsa; 88♀, 27♂, 11–14 and 20 July 1989 (C.D. Michener, R.W. Brooks, A. Roig Alsina), on O. excelsa (34♀, 23♂), Coccoloba barbadensis (1♀), malaise trap (52♀). Holotype in collection of UNAM; paratypes in BBSL, LACM, UCR, UKAN, UNAM (Chamela), and USNM.

ETYMOLOGY

The specific name, a noun in apposition, is the singular form of the Nahuatl name for a bee.

DISCUSSION

The similarity of the scopal hairs between this species and P. nahua has already been commented on in the discussion of that species. Other similarities have also been noted above. The longer and more abundant pilosity on the propodeal side will separate females of P. pipiyolin from those of P. nahua, as will the smooth basal area of the propodeum.

Males of the two species are similar and in both species there is a distinct ventral process near the apex of the aedeagus. That of P. nahua is small and acute (Fig. 22), whereas in P. pipiyolin the process is quite robust and obtuse (Fig. 21). The base of the propodeum in P. pipiyolin is, as in females of this species, smooth and without rugulae.

Aside from the variations in size noted above, all specimens are quite consistent in their characters, including color.

All the type locality females appear to be oligoleges on Opuntia excelsa; the single female collected on Lonchocarpus cochleatus has only Opuntia pollen in her scopa.

**Perdita (Macrotera) sinaloana** Timberlake

Figures 5, 11, 16, 23, 25, 35


The type pair was collected 50 miles S of Los Mochis, Sinaloa, Mexico. The types are now in the CAS collection. In addition to the types we have seen one female: 25 mi S Navajoa, Sonora, MEXICO, 13 Sept. 1963 (K.H. Janzen; UCB).

The short, oblique facial foveae are especially characteristic of the male. The female most closely
resembles that of P. texana, another species with few or no hairs at the side of the propodeal disc. In the above key we have chosen not to cite the differences in female mesoscutal punctuation noted by Timberlake (1958). The differences do exist but are not as clear-cut as suggested in his key. In P. texana the punctures are up to about 0.026 mm in diameter and are mostly separated by about a puncture diameter, but in many specimens there are some interspaces of up to about 0.025 and 0.051 mm in diameter, mostly over 0.030 mm. Many interspaces are up to about 3 times a puncture diameter, but some are as little as a puncture diameter. So, although the differences do exist, they are difficult to appreciate if comparative material is not available.

**Perdita (Macrotera) texana** (Cresson)  
Figures 1, 6, 12, 18, 27, 32, 34, 35

Macrotera texana Cresson, 1878:70; ♀.  
Macrotera megacephala Cresson, 1878:71; ♂.  
Perdita texana: Cockerell, 1896:52.  
Perdita secunda Cockerell, 1904:205; ♀. NEW SYNONMY.  
Perdita (Macrotera) texana texana: Timberlake, 1958:375, 376; ♀ ♂. NEW SYNONMY.  
Perdita (Macrotera) texana ablusa Timberlake, 1958:375, 376; ♀ ♂. NEW SYNONMY.

The type of *P. secunda*, from an unknown locality in Mexico, is in the BMNH. Except for the dark brownish metasoma it appears to be the same as *P. texana*, especially in the punctuation of the clypeus, mesoscutum, and scutellum, and the pilosity of the propodeal disc. We do not regard the color difference as significant and so treat *P. secunda* as a synonym of *P. texana*.

We have also synonymized Timberlake’s subsp. *ablusa*, described from New Mexico and western Texas. This form was characterized largely on the basis of its more extensive reddish color and paler wings, a trivial distinction at best. And, because such specimens occur sporadically within populations of the “typical” form in central Texas, the distinction appears to be specious as well.

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