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April 1981, Vol. 57, No. 2, pp. 371-379**TWO NEW SPECIES OF *POGONOMYRMEX* HARVESTER ANTS  
FROM TEXAS (HYMENOPTERA: FORMICIDAE)<sup>1</sup>**OSCAR F. FRANCKE AND FRANK W. MERICKEL<sup>2</sup>Department of Entomology and The Museum, Texas Tech University,  
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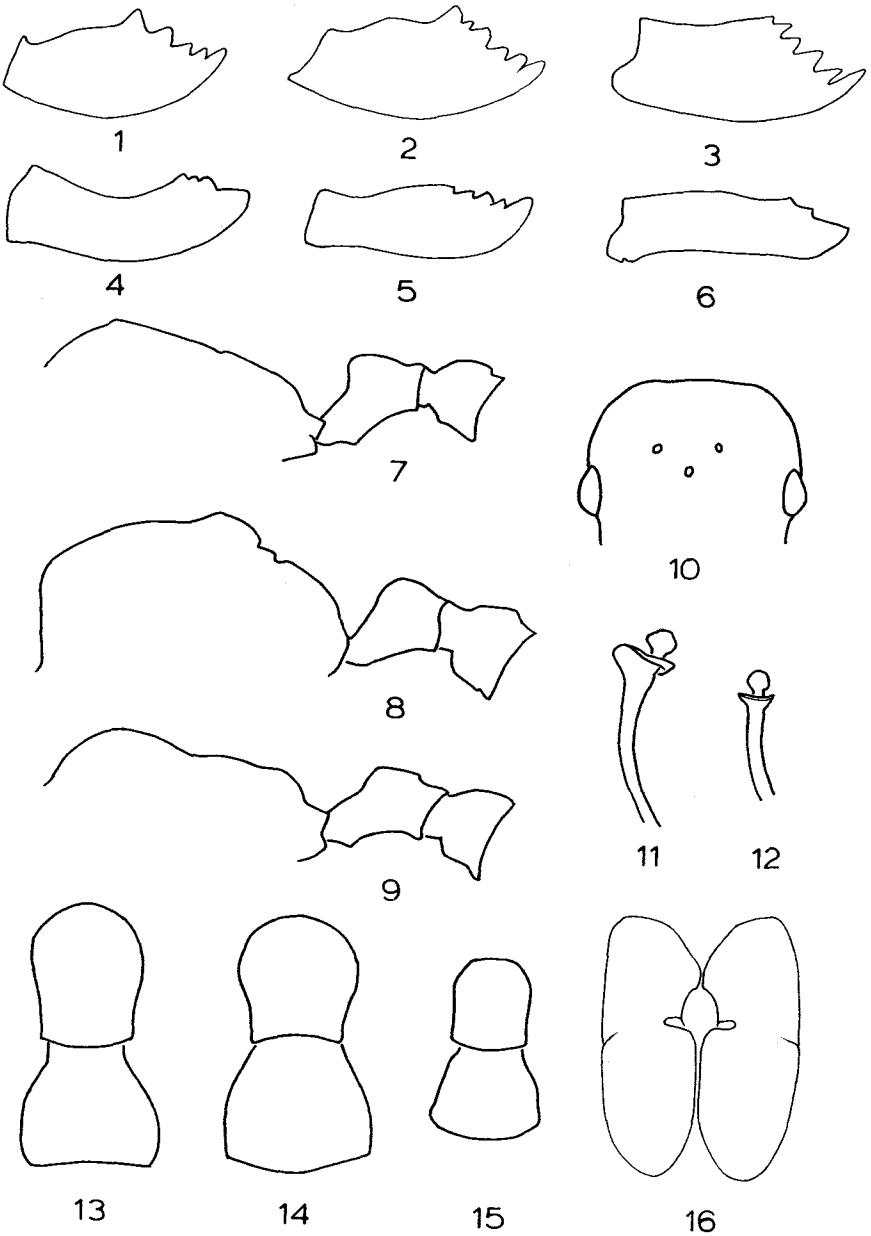
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Harvester ants of the genus *Pogonomyrmex* Mayr are among the most conspicuous members of the formicid fauna of the arid and semiarid regions of the southwestern United States. In the most recent revision of the North American harvester ants, Cole (1968) recognized 23 species grouped in two subgenera; two species occurring only in Mexico, and 21 present in the United States, nine of which occur in Texas. A faunistic survey of the ants of Texas west of the 100th meridian was initiated in 1978 by several members of the Department of Entomology, Texas Tech University. We have accessioned slightly over 8000 nest series representing about 40 genera and 140 species. Harvester ants represent approximately 17.5% of the samples in our collection ( $n = 1400$  nest series), and all the species reported from Texas by Cole (1968) are adequately represented. In addition, however, we have identified two new species, whose descriptions follow. For the sake of continuity, and ease of identification, the terminology used and the measurements provided follow Cole (1968).

***Pogonomyrmex (Pogonomyrmex) bigbendensis*, new species**  
(Figs. 1, 2, 9, 12, 15)

*Worker*.—Measurements of holotype followed, in parenthesis, by the ranges observed in paratypes: Head length 1.75 mm (1.49–1.75 mm), head width 1.85 mm (1.61–1.87 mm), cephalic index 105.7 (105.2–108.7), scape length 1.20 mm (1.08–1.22 mm), scape index 71.35 (71.35–73.78), maximum eye length 0.40 mm (0.34–0.41 mm), maximum eye width 0.28 mm (0.26–0.30 mm), ocular index 22.86 (22.82–23.26), Weber's length 1.82 mm (1.56–1.85 mm), petiolar node length 0.48 mm (0.44–0.49 mm), maximum width of petiolar node 0.36 mm (0.30–0.40 mm), postpetiolar length 0.39 mm (0.35–0.40 mm), postpetiole width 0.51 mm (0.45–0.54 mm).

Head slightly broader than long; eye small, weakly convex, not extending beyond lateral margin of head. Mandible with five or six teeth (Figs. 1–2): ultimate basal tooth distinctly offset from basal mandibular margin, forming a rounded angle; penultimate basal tooth greatly reduced or aborted; third basal tooth very broad basally, somewhat pointed apically, with lateral margins deeply excised; second basal tooth apparently aborted; first basal, sub-



Figs. 1-16. North American *Pogonomyrmex*: Figs. 1-3, right mandible of worker; 1, *P. bigbendensis*, n. sp., with five teeth, 2, *P. bigbendensis* with six teeth, 3, *P. anzensis* Cole with six teeth (redrawn from Cole, 1968); Figs. 4-6, right mandible of male; 4, *P. texanus*, n. sp., 5, *P. desertorum* Wheeler, 6, *P. apache* Wheeler; Figs. 7-9, lateral profile of thorax, petiole, and

apical, and apical teeth broad basally, blunt apically. Apical margin of mandible broadly convex, basal margin somewhat sinuous. Antennal scape moderately curved on basal one-half, area of bend compressed. Base of antennal scape (Fig. 12) similar to that of *P. bicolor* Cole: with very narrow basal flange; superior and inferior lobes subequal; impression on lateral surface of basal enlargement small and shallow, the longitudinal peripheral carina very narrow and not ending in a distinct point. Lateral lobes of clypeus produced in front of antennal insertions, projecting anteriorly beyond level of median clypeal lobe; frontal lobes ascending moderately steeply from clypeal lobe, not forming a deep impression for median clypeal lobe and adjoining frontal triangle. Median cephalic rugae longitudinal, widely spaced, extremely fine; interrugal spaces strongly shiny; in lateral view rugae reduced to very indistinct striae, either parallel or somewhat concentric behind eyes. Posterior corner of head smooth and shiny.

Contour of thorax, petiole, and postpetiole, in lateral view, as in Fig. 9. Dorsum of thorax flat, epinotal declivity short and distinct, epinotal armature absent. Thoracic rugae coarse, transverse and widely spaced on anterior of pronotum, transverse to longitudinal on posterior of pronotum; transverse and more closely set on mesonotum and epinotum; interrugal spaces strongly shiny on all segments. Dorsal portions of metasternal flanges fused, forming a single arcuate carina across posterior declivity of epinotum. Contours of petiolar and postpetiolar nodes, in dorsal view, as in Fig. 15. Ventral peduncular process of petiole distinct, thick, rounded, with 0–5 erect hairs. Petiolar and postpetiolar nodes shagreened, rugae when present confined to posterior half; anterior declivity of petiolar node short, meeting peduncle in broad, well rounded angle. First gastric segment slightly broader than long. Body color medium to dark ferruginous red.

*Male*.—Unknown.

*Female*.—Unknown.

*Type data*.—Type nest series (workers only) from Rio Grande Village (565 m), Big Bend National Park, Brewster Co., Texas, 30 July 1978 (J. V. Moody, O. F. Francke). Holotype worker deposited at the California Academy of Sciences, San Francisco.

*Distribution*.—Known only from Big Bend National Park, Brewster Co., Texas.

*Comparisons*.—*Pogonomyrmex bigbendensis* belongs in the *barbatus*

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postpetiole; 7, *P. texanus* worker, 8, *P. texanus* male, 9, *P. bigbendensis* worker: Fig. 10, frontal view of *P. texanus* male head: Figs. 11–12, base of antennal scape; 11, *P. texanus* worker, 12, *P. bigbendensis* worker: Figs. 13–15, dorsal profile of petiolar and postpetiolar nodes; 13, *P. texanus* worker, 14, *P. texanus* male, 15, *P. bigbendensis* worker: Fig. 16, dorsal view of parameres of *P. texanus* male.

complex as defined by Cole (1968). The following characters, diagnostic of the *barbatus* complex, are also present in *P. bigbendensis*: (1) not polymorphic, (2) lateral lobes of clypeus projecting anteriorly beyond the level of the median clypeal lobe, (3) head broader than long, (4) eye small and weakly convex, not extending beyond sides of head with head in full-face view, (5) longitudinal cephalic rugae nearly straight and parallel, (6) venter of petiolar peduncle with a few, long, erect hairs extending downward from the peduncular process, and (7) first gastric segment broader than long. *P. bigbendensis* differs from all other species in the *barbatus* complex in mandibular dentition: the seven species known from workers have seven teeth on the mandible, and the ultimate basal tooth is not offset from the basal mandibular margin; whereas in *P. bigbendensis* the mandible bears 5–6 teeth, and the ultimate basal tooth is distinctly offset from the basal mandibular margin.

The mandibular dentition of *P. bigbendensis* appears to be unique among the North American species in the subgenus *Pogonomyrmex*, and thus can be used to identify this species readily. The only other North American species known to have six mandibular teeth is *P. anzensis* Cole (Fig. 3), a member of the *occidentalis* complex, but in this taxon the ultimate basal tooth is not offset from the basal mandibular margin. On the other hand, *P. occidentalis* (Cresson) which has the ultimate basal mandibular tooth distinctly offset from the basal margin, as occurs in *P. bigbendensis*, has seven mandibular teeth and can thus be readily separated.

Within the *barbatus* complex, *P. bigbendensis* will key out to *P. apache* Wheeler in Cole's (1968) key, the species to which it also appears to be most closely related. *P. bigbendensis* shares with *P. apache* the following characters: (1) cephalic rugae extremely fine and closely set, (2) posterior corner of head without rugae, smooth and strongly shiny, (3) epinotum generally unarmed, and (4) dorsal portions of metasternal flanges fused so as to form a single arcuate carina across posterior declivity of epinotum. These two species differ as follows: (1) base of antennal scape, as in Fig. 11 for *P. bigbendensis*, and very similar to Fig. 12 in *P. apache* (see Cole, 1968, p. 190, fig. 18); (2) mandibular dentition, with 5–6 teeth in *P. bigbendensis* and with ultimate basal tooth offset from margin, and with seven teeth in *P. apache* with ultimate basal tooth not offset from margin; (3) clypeal excision, with anterior margin of clypeal lobe straight or only broadly and shallowly excised in *P. bigbendensis*, and with the clypeal lobe deeply excised, often to the level of the frontal lobes, in *P. apache*; and (4) size, with a Weber's length range of 1.56–1.85 mm in *P. bigbendensis*, versus a range of 1.90–2.51 mm in *P. apache* (after Cole, 1968).

The base of the antennal scape in *P. bigbendensis* is very similar to that of *P. bicolor* Cole, another species in the *barbatus* complex. These two taxa differ significantly in a number of characters, among which the presence

of: (1) epinotal armature, (2) seven mandibular teeth with ultimate basal tooth not offset from margin, and (3) bicolored body with head and thorax red, and gaster black, in *P. bicolor* readily separate it from *P. bigbendensis*.

*Specimens examined*.—All specimens examined are from Big Bend National Park, Brewster Co., Texas, as follows: Rio Grande Village (565 m, level terrain, nest under rock), 30 July 1978 (J. V. Moody, O. F. Francke; type nest series, 16 workers); Burro Mesa Pouroff (1076 m, 2° SW slope, nest with 10 × 13 cm pebble tumulus), 9 August 1979 (J. V. Moody, O. F. Francke, F. W. Merickel; 9 workers). Paratypes deposited in the following collections: California Academy of Sciences, American Museum of Natural History, Museum of Comparative Zoology, Los Angeles County Museum, and Texas Tech University.

***Pogonomyrmex (Pogonomyrmex) texanus*, new species**

(Figs. 4, 7, 8, 11, 13, 14, 16)

*Worker*.—Measurements of holotype followed, in parenthesis, by the ranges observed in paratypes: Head length 2.15 mm (2.05–2.35 mm), head width 2.45 mm (2.15–2.56 mm), cephalic index 113.95 (104.88–113.95), scape length 1.65 mm (1.45–1.75 mm), scape index 74.08 (74.08–75.49), maximum eye length 0.45 mm (0.40–0.48 mm), maximum eye width 0.35 mm (0.32–0.38 mm), ocular index 20.93 (19.51–20.93), Weber's length 2.65 mm (2.30–2.75 mm), petiolar node length 0.75 mm (0.65–0.80 mm), maximum width of petiolar node 0.60 mm (0.49–0.60 mm), postpetiolar length 0.65 mm (0.60–0.68 mm), postpetiole width 0.80 mm (0.65–0.80 mm).

Head broader than long; eye small and weakly convex, not extending beyond lateral margin of head. Mandible with seven subequal, blunt teeth. Apical margin of mandible broadly convex, basal margin straight. Base of antennal scape (Fig. 11) similar to *P. apache* Wheeler: with superior lobe considerably stronger than inferior lobe; basal flange very weak on superior lobe, developed as a strongly recurved lip on inferior lobe; longitudinal peripheral carina very strong, point absent. Lateral lobes of clypeus produced in front of antennal insertions, margin of clypeal lobe broadly and shallowly excised; frontal triangle deeply impressed. Median cephalic rugae longitudinal, parallel; extremely fine and closely set, producing a silky luster; interrugal spaces shiny; in lateral view rugae not forming whorls behind eye; posterior corner of head without rugae, smooth, strongly shiny.

Contour of thorax, petiole, and postpetiole, in lateral view, as in Fig. 7. Thoracic rugae dense, fine, and shiny; transverse throughout. Epinotum unarmed; posterior epinotal declivity short, smooth. Dorsal portions of metasternal flanges fused, forming a single arcuate carina across posterior declivity of epinotum. Venter of petiolar peduncle with a few long, erect hairs in vicinity of peduncular process. Petiolar node flattened dorsally; with

faint, transverse striae. Postpetiolar node dorsally with faint, transverse striae. Contour of petiolar and postpetiolar nodes, in dorsal view, as in Fig. 13. First gastric segment broader than long. Body color uniformly reddish brown.

*Male*.—The two known males are of similar size, the measurements for one of them are as follows: Head length 1.62 mm, head width 1.95 mm, cephalic index 120.00, scape length 0.75 mm, scape index 42.31, maximum eye length 0.54 mm, maximum eye width 0.36 mm, ocular index 33.84, Weber's length 2.70 mm, petiolar node length 0.70 mm, maximum width of petiolar node 0.75, postpetiolar length 0.70 mm, postpetiole width 0.82 mm.

Head with lateral outline between eye and occipital corner evenly, rather strongly convex; eye not strongly convex, not strongly protruding from lateral margin of head (Fig. 10). Basal margin of mandible strongly concave, apical margin broadly convex; both margins subparallel to each other; with four teeth, broad, blunt and robust (Fig. 4). Antennal scape with outer surface of base evenly convex; antennal scape longer than combined lengths of first two segments of flagellum, shorter than combined lengths of first three segments of flagellum; apical segment of flagellum less than twice length of subapical segment, which is distinctly longer than wide. Anterior margin of median clypeal lobe broadly, very shallowly excised. Upper surface of head unstriated, smooth and shiny. Interocellar area with very faint longitudinal, parallel striae. Posterior corner of head smooth, shiny. Clypeus vestigially striate. Mandibles feebly rugose, shiny. Entire head with moderately dense, long, white, very fine erect hairs.

Contour of thorax, petiole, and postpetiole, in lateral view, as in Fig. 8. Epinotum unarmed. Entire thorax shiny; scutum, scutellum, and basal face of epinotum very shiny. Nota smooth; pleura vestigially striate to smooth, shiny. Forewing with one cubital cell. Petiolar and postpetiolar nodes, in dorsal view, as in Fig. 14; smooth and shiny throughout. Venter of petiolar peduncle with poorly developed, blunt tooth, bearing numerous erect hairs. Paramere as in Fig. 16. Head and thorax black, gaster reddish brown; body hairs fine and silky, mostly pure white.

*Female*.—Unknown.

*Type data*.—Type nest series (workers, males, brood) from Lubbock (Farm Road 2641 at Blackwater Draw, 990 m), Lubbock Co., Texas, 2 July 1973 (J. V. Moody). Holotype worker and paratype male deposited at the California Academy of Sciences, San Francisco.

*Distribution*.—Known from 13 counties in western Texas.

*Comparisons*.—*Pogonomyrmex texanus* belongs to the *barbatus* complex of Cole (1968). Workers of *P. texanus* share with other members of this complex the seven characters listed above in the comparisons of *P. big-bendensis*. The following characters of males, diagnostic of the *barbatus* complex, are also present in males of *P. texanus*; (1) head with the lateral

outline between the eye and the occipital corner evenly and rather strongly convex, (2) eye not strongly convex, not protruding from side of head, (3) mandible with teeth broad, blunt, and robust, (4) forewing generally with one cubital cell, and (5) venter of petiolar peduncle with numerous long, erect, ventrally directed hairs.

Within the *barbatus* complex, *P. texanus* appears to be most closely related to *P. apache* and *P. bigbendensis*, and workers of these three species share the four characters listed above under comparisons between *P. apache* and *P. bigbendensis*. Workers of *P. texanus* differ from those of *P. bigbendensis* as follows: (1) mandibular dentition, with seven teeth in *P. texanus* and with the ultimate basal tooth not offset from margin, but with 5–6 teeth in *P. bigbendensis* and with the ultimate basal tooth distinctly offset from margin; (2) base of antennal scape, as Fig. 11 in *P. texanus*, and as Fig. 12 in *P. bigbendensis*; (3) shape of petiolar and postpetiolar nodes, in dorsal view, as Fig. 13 in *P. texanus*, and as Fig. 15 in *P. bigbendensis*; and (4) size, with a Weber's length of 2.30–2.75 mm in *P. texanus* versus 1.56–1.85 mm in *P. bigbendensis*. Workers of *P. texanus* differ from those of *P. apache* as follows: (1) clypeal excision, with anterior margin of clypeal lobe broadly and shallowly excised in *P. texanus*, but with the clypeal lobe deeply excised, often to the level of the frontal lobes, in *P. apache*; (2) posterior epinotal declivity, smooth in *P. texanus*, and transversely rugose in *P. apache*; (3) ventral process of postpetiole, very weakly developed in *P. texanus*, moderately developed in *P. apache*; and (4) size, with a Weber's length range of 2.30–2.75 mm in *P. texanus* versus a range of 1.9–2.51 in *P. apache*.

The males of *P. texanus* differ from those of *P. apache* as follows: (1) clypeal excision, with anterior margin of clypeal lobe broadly and shallowly excised in *P. texanus*, and rather deeply and broadly excised in *P. apache*; (2) shape of mandible, as Fig. 4 in *P. texanus*, as Fig. 6 in *P. apache*; (3) proportions of the last two segments of antennal flagellum, in *P. texanus* the apical segment is distinctly less than twice the length of the subapical segment, whereas in *P. apache* the apical segment is about twice the length of the subapical segment; (4) paramere morphology, as Fig. 16 in *P. texanus*, whereas in *P. apache* the terminal lobe is proportionately shorter, more angular and with a deeper excision on the inner margin (see Cole 1968, pl. X, fig. 12); and (5) color, *P. texanus* is distinctly bicolored with the head and thorax black and the gaster reddish brown, whereas *P. apache* is concolorous shiny black.

In Cole's (1968) key to males of the *barbatus* complex, *P. texanus* will key out to *P. desertorum* Wheeler because of its bicolored nature. The males of these two species, however, can be easily separated by the following characters: (1) mandibles, as Fig. 4 in *P. texanus*, and as Fig. 5 in *P. desertorum*; (2) epinotal armature, absent in *P. texanus*, but with two weak

tubercles in *P. desertorum*, and (3) parameres, as Fig. 16 in *P. texanus*, whereas in *P. desertorum* the terminal lobe is proportionately shorter and almost semicircular in outline (see Cole, 1968, pl. X, fig. 13). Workers of these two species are only superficially similar because of the fineness of the cephalic rugae and the broadly, shallowly emarginate clypeal lobe. They can be separated as follows: (1) epinotal armature, absent in *P. texanus*, and present as two long, sharp spines in *P. desertorum*; (2) base of antennal scape, as Fig. 11 in *P. texanus*, and more like Fig. 12 in *P. desertorum*, with the superior and inferior lobes subequal; (3) metasternal flanges, with dorsal portions fused in *P. texanus*, forming a single arcuate carina across posterior declivity of epinotum, whereas the dorsal portions are not fused in *P. desertorum*, and thus do not form an arcuate carina across the epinotal declivity; and (4) size, with a Weber's length range of 2.30–2.75 mm in *P. texanus* versus 1.60–2.28 mm in *P. desertorum*.

*Remarks.*—We have collected and studied 21 nest series of *P. texanus*. All the nests were found in open situations, mostly in level terrain (16 of 21; greatest slope exposure noted 20°). The altitudinal range is 580–1645 m (1900–5400 ft), with most ( $n = 15$ ) coming from 610–915 m (2000–3000 ft). Soil characterization of the nests is as follows: clay 8, sandy clay loam 4, clay loam 3, silty clay loam, sandy, and sandy clay 1 each. Conical craters with a central depression, ranging from 5 cm diameter and 2.5 cm high to 25 cm × 10 cm (predominantly about 10 cm × 6 cm), were present on 16 nests; relatively flat discs were present on two (30 cm and 12 cm diameter, respectively); and on three occasions no excavated material about the nest entrance was observed.

The workers move slowly and at a steady gait, in contrast to the erratic, hesitant gait of *P. apache* (see Cole, 1954, 1968; pers. obs.). The gaster is usually held parallel to the substrate, in contrast to *P. desertorum* which frequently forages with the gaster turned downward (Cole, 1968; pers. obs.). Colonies are usually small (less than 100 workers), and there is no aggressive response when the nest is disturbed.

To crudely determine the relative potency of the venom of *P. texanus*, the senior author allowed one worker to sting him on the forearm. The symptoms experienced are very similar to those resulting from envenomation by *P. barbatus* or *Pogonomyrmex rugosus* Emery.

*Specimens examined.*—In addition to the type nest series we have examined workers (designated paratypes) from the following localities in Texas: Brewster Co., 29.2 km NE Marathon (1265 m), 27 July 1978 (T. B. Hall, J. V. Moody, O. F. Francke); 6.5 km W Marathon (1250 m), 27 July 1978 (T. B. Hall, J. V. Moody, O. F. Francke: two nest series). Coke Co., 22.7 km NW Robert Lee (610 m), 25 July 1978 (T. B. Hall, J. V. Moody, O. F. Francke). Crane Co., 8.1 km W Crane (750 m), 5 June 1979 (J. V. Moody, O. F. Francke, F. W. Merickel). Crosby Co., 17.6 km N Crosbyton (880 m), 15 June 1978 (D. P. Bartell, R. Beckham, G. Henderson, K. Neece).



Culberson Co., Guadalupe Mountains National Park, mouth of McKittrick Canyon (1540 m), 14 June 1978 (J. V. Moody, O. F. Francke). Dickens Co., 21.9 km N Dickens (790 m), 11 June 1979 (W. D. Sissom, J. V. Moody, O. F. Francke). Hall Co., 24 km S Estelline (580 m), 8 June 1978 (D. P. Bartell, R. Beckham, G. Henderson, K. Neece). Midland Co., 48.6 km SW Midland (880 m), 5 June 1979 (J. V. Moody, O. F. Francke, F. W. Merickel: two nest series); 27.5 km S Midland (820 m), 12 August 1979 (J. V. Moody, O. F. Francke, F. W. Merickel). Pecos Co., 6.5 km SE Sheffield (670 m), 10 August 1978 (T. B. Hall, J. V. Moody, W. D. Sissom, O. F. Francke). Presidio Co., 34.7 km SW Marfa (1645 m), 8 August 1979 (J. V. Moody, O. F. Francke, F. W. Merickel). Reagan Co., 21 km W Big Lake (850 m), 10 August 1978 (T. B. Hall, J. V. Moody, W. D. Sissom, O. F. Francke: two nest series). Terrell Co., 53 km N Dryden (655 m), 21 October 1978 (E. L. Meeks, J. V. Moody). Upton Co., 11 km N Rankin (670 m), 11 August 1978 (T. B. Hall, J. V. Moody, W. D. Sissom, O. F. Francke: two nest series); 37.3 km NW Rankin (870 m), 5 June 1979 (J. V. Moody, O. F. Francke, F. W. Merickel). Paratypes deposited in the following collections: California Academy of Sciences, American Museum of Natural History, Museum of Comparative Zoology, Los Angeles County Museum, and Texas Tech University.

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### Footnotes

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