

TABLE I
Activity of Reproductives of:

Locality	Date	Activity
<i>M. melliger</i> Forel		
ZAC., 9 mi S Fresnillo	24 June 1956	♂♂, ♀♀ in nest
HGO., 5 mi N Zimapán	21 Nov. 1946	♀♀ in nest
TEX., Ft. Davis	8-9 June 1902	♂♂, ♀♀ in nest
TEX., Crouching Lion, Davis Mts.	22 July 1933	deälate ♀
TEX., 21 mi N Ft. Davis	20 Aug. 1967	♀♀ in nest
<i>M. mendax</i> Wheeler		
COLO., Mt. Washington	19 July 1903	♂♂, ♀♀ in nest
COLO., 5 mi NE Cañon City	24 Aug. 1967	♂♂ in nest
TEX., 6 mi W Austin	21 Apr. 1903	deäl. ♀ —on ground?
N.MEX., Santa Fe	26 July 1968	♂♂ in nest
N.MEX., Cimarron Cyn.	29-31 Aug. 1951	♂♂, ♀♀ in nest
ARIZ., S.W.R.S.	29 June 1956	♂♂ in nest
ARIZ., Cave Cr. Cyn.	4 July 1963	♀♀ in nest
ARIZ., Garden Cyn.	10 July 1950	mating flight in afternoon after rain
ARIZ., Forestry Cabin	26 July 1951	mating flight
ARIZ., Madera Cyn.	25 July-5 Aug. 1965	♂♂ in nest
ARIZ., Miller Cyn.	18 Aug. 1971	♂♂ in nest
ARIZ., Carr Cyn.	18 Aug. 1971	♂♂ in nest
ARIZ., 8.1 mi SE Sunnyside	23 Aug. 1971	♀♀ in nest
CALIF., Carson's Well	31 Jan. 1967	♂♂ in nest

The populations of large, long-haired *Myrmecocystus* from New Mexico and Arizona, heretofore thought to be *melliger*, or its junior synonym *comatus*, are now believed to represent a long-haired variant of *mendax*. These are discussed more fully under that species. The species most closely related to *melliger* apparently is *mendax*, for the workers of the two are very similar in details of head shape, punctation, and petiolar shape. The females, also, are very similar. The apparent closeness is further enhanced by the long-haired *mendax* variant which is extremely similar to *melliger*.

The differences are subtle but constant in the material available. They are best appreciated when comparative material of both species is available for direct comparison. The distinctions are based on large workers with head width in excess of 1.5 mm; smaller workers are much more difficult to separate.

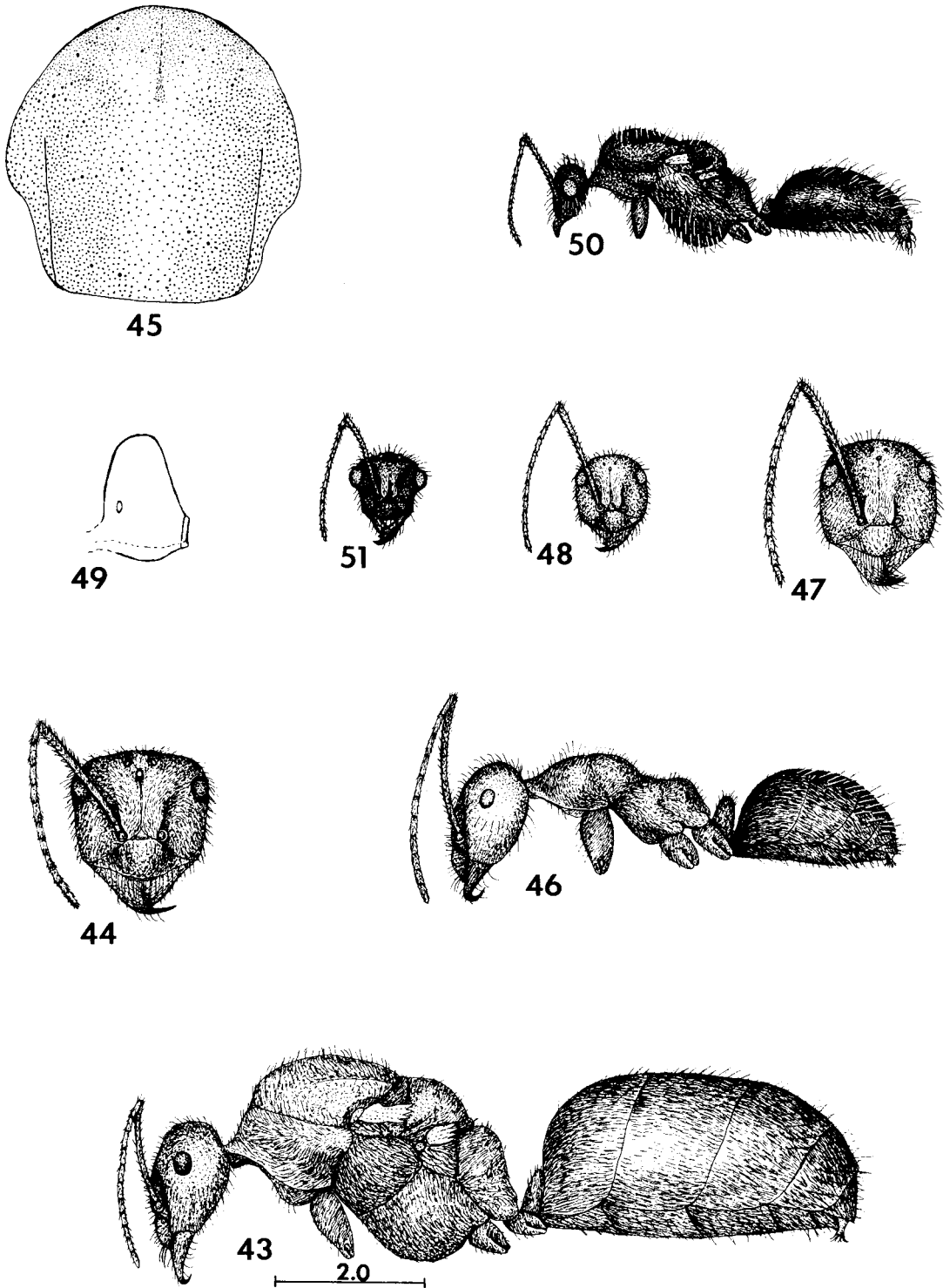
The longest occipital and pronotal hairs of *melliger* are longer than the eye length, as are those on the disc of the second tergum (Fig. 37). Those of the pronotal disc are very slender and are prone to curl apicad; the appearance is one of "woolliness." The long-haired variant of *mendax* usually has the longest occipital hairs not exceeding eye length. The pronotal hairs are also usually shorter than, but may be equal to, eye length and the discal hairs of the second tergum are always less than eye length. The pronotal hairs are gently and evenly curved and there seems to be no tendency for these to curl apicad; the appearance, then, is one of "hairiness" rather than "woolliness."

Myrmecocystus (Endiodioctes) mendax Wheeler

Figures 43-51, 155, 167, 179, 187

- Myrmecocystus melliger* var. *semirufa* Emery 1893. Zool. Jahrb. Syst. 7:667. ♀♂ (*in part*).
- Myrmecocystus melliger* subsp. *orbiceps* Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:349-351. ♀♀ (*in part*); Wheeler 1912. Psyche 19:173, 175 (*in part*); Creighton 1950. Bull. Mus. Comp. Zool. 104:445 (*in part*). NEW SYNONYMY.
- Myrmecocystus melliger* subsp. *mendax* Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:351-352. ♀♀♂. Wheeler 1912. Psyche 19:173. Cole 1942. Amer. Midl. Nat. 28:385; Gregg 1963. Ants of Colorado, p. 645-648.
- Myrmecocystus melliger*, Wheeler 1912. Psyche 19:173, 174 (*in part*); Creighton 1950. Bull. Mus. Comp. Zool. 104:444-445 (*in part*).
- Myrmecocystus mendax*, Creighton 1950. Bull. Mus. Comp. Zool. 104:445, Cole 1954. Jour. Tenn. Acad. Sci. 29:284; Snelling 1969. Contr. Sci., L.A.C.M. 170:2, 8.
- Myrmecocystus semirufa*, Creighton 1950. Bull. Mus. Comp. Zool. 104:449-450 (*in part*).
- Myrmecocystus semirufus*, Cook 1953. The ants of Calif.; p. 345 (*in part*).
- Formica subpolita* var. *camponoticeps*, Cook 1953. The ants of Calif., p. 397 (*in part, misident.*).
- Myrmecocystus comatus*, Cole 1954. Jour. Tenn. Acad. Sci. 29:284; Gregg 1963. Ants of Colorado, 643-645 (*misident.*).
- Myrmecocystus placodops*, Snelling 1969. Contr. Sci., L.A.C.M. 170:6 (*in part*).

Diagnosis. Worker: HW 0.9-1.9 mm; malar area with numerous erect hairs; longest hairs of pronotum and disc of second tergum of large workers at least 0.6 × MOD, usually longer; long pronotal hairs grad-



FIGURES 43–51. *M. mendax*. 43, female, lateral view; 44, head of female, frontal view; 45, mesoscutum of female, distribution of punctures; 46, major worker, lateral view; 47, head of major worker, frontal view; 48, head of minor worker, frontal view; 49, petiole of major worker, lateral view; 50, male, lateral view; 51, head of male, frontal view.

usually tapering to tip which is not conspicuously curled, but may be gently curved. *Female*: Apparently inseparable from that of *melliger*. *Male*: Apparently inseparable from those of *melliger* and *placodops*.

WORKER: Measurements. HL 1.10–1.97 (1.65); HW 0.93–1.92 (1.55); SL 1.37–2.24 (1.90); WL 1.8–3.3 (2.5); PW 0.7–1.4 (1.1).

Head: Distinctly longer than broad to slightly broader than long, CI 85–103 (94), distinctly shorter than scape, SI 110–132 (118); in frontal view, sides straight and hardly narrowed toward mandibular insertions (small workers) to gently, evenly convex and distinctly convergent toward mandibular insertions. Occiput, in frontal view, low and gently convex in small workers, flattened in large workers, broadly rounded at sides. Eye small, $1.10\text{--}1.15 \times$ first flagellomere; OMD $1.57\text{--}2.36$ (2.00) \times EL. Mandible with seven teeth.

Thorax: Slender to moderately robust, PW 0.35–0.46 (0.44) \times WL. Propodeum, in profile, about as high as long, basal face slightly sloping and broadly rounded into posterior face.

Petiole: In profile, thick, not at all cuneate, summit broadly rounded, but may be flattened, rarely subangulate; crest, in frontal view, usually flat, but may be slightly concave.

Vestiture: (Based on workers with PW in excess of 0.9 mm). Cephalic pubescence general, but sparse, never obscuring integument, most abundant on occiput, vertex and frontal lobes. Sparse on pronotum, more abundant on remainder of thorax, only partially obscuring surface, densest on propodeum. First three terga with conspicuous pubescence, usually notably sparse in small workers; fourth tergum usually not pubescent, except in some large workers of southern populations.

Malar area with 15+ short, erect hairs (sometimes as few as 10 in smallest workers); longest occipital hairs (in large workers) $0.75\text{--}1.20 \times$ MOD, hairs curved but not curled, gradually narrowed toward apex; area between eye and frontal lobe with numerous short, erect hairs. Pronotal hairs abundant, often somewhat curved but not curled at apex, gradually tapering to apex, longest hairs $0.75\text{--}1.1 \times$ MOD, not exceeding EL; mesonotal hairs shorter, at most $0.6 \times$ MOD; basal face of propodeum with numerous erect hairs, longest $0.7\text{--}1.0 \times$ MOD. Petiole with numerous erect hairs on sides and crest, longest not more than $0.5 \times$ MOD, usually less. Abdominal terga with abundant long erect hairs, longest on disc of second tergum $0.9\text{--}1.0 \times$ MOD. Scape, all surfaces of femora and tibiae, with abundant short, fine, erect and suberect hairs, longest hairs of hind tibia shorter than maximum width of that segment.

Integument: Head slightly to moderately shiny, lightly shagreened; frontal lobe closely micropunctate and with sparse coarse punctures, punctation more or less obscured by dense shagreening; face, between eye and frontal lobe with abundant obscure micropunctures

and scattered coarse punctures; malar area with sparser coarse, shallow punctures; vertex and occiput densely micropunctate and with sparse coarse punctures and a few shallow poriform punctures; punctation extending laterad to sides of head. Thorax slightly shiny, densely shagreened and micropunctate, with sparse coarse punctures; propodeum duller, more densely micropunctate. First two (minor workers) (three in southern populations) or three (major workers) (four in southern populations) terga moderately shiny, closely micropunctate and with sparse shallow poriform punctures.

Color: Head yellowish to brownish ferruginous, often lighter anteriorly; thorax light to medium brownish, pronotum and sides often yellower; gaster medium to dark brownish; legs light to medium brownish; antennae yellowish to reddish brown, apical segments darker.

FEMALE. Measurements. HL 1.87–2.13; HW 1.90–2.16; SL 1.83–2.20; WL 4.0–4.8; PW 2.5–3.2.

Head: Slightly broader than long, CI 102–108; in frontal view, sides straight or slightly concave, a little convergent toward mandibular insertions; a little shorter, to a little longer than, scape, SI 95–103. Occiput, in frontal view, slightly convex, broadly rounded at sides. Eye small, $0.93\text{--}1.25 \times$ first flagellomere; OMD $1.60\text{--}1.73 \times$ EL; OOD $4.0\text{--}6.0 \times$ OD; IOD $2.4\text{--}3.3 \times$ OD. Mandible with seven teeth. Penultimate segment of maxillary palp slender, broadest in basal third, evenly tapered toward apex.

Thorax: Moderately to very robust, PW 0.56–0.70 \times WL. Scutum flattened behind; scutellum convex in profile, a little flattened in front. Basal face of propodeum strongly sloping and broadly rounded onto posterior face.

Petiole: In profile, thickly cuneate, more compressed above, summit narrowly rounded; crest, in frontal view, deeply angularly incised.

Vestiture: Cephalic pubescence general but sparse, most abundant on malar area near mandibular base, on frontal lobe and on occiput. Mesoscutum with pubescence general but sparse, absent only from median impunctate area; general but sparse on scutellum. Pronotum, pleura and propodeum much more conspicuously pubescent. First four terga uniformly and closely pubescent.

Malar area with 15+ erect hairs, longest less than $0.5 \times$ MOD; face with sparse, short erect hairs, including area between eye and frontal lobe; longest occipital hairs $0.5\text{--}0.7 \times$ MOD (up to $1.0 \times$ MOD in Edwards Plateau populations). Longest mesocutal hairs usually about $0.5\text{--}0.6 \times$ MOD, but may be as much as $0.9 \times$ MOD (Edwards Plateau populations), hairs sparse, suberect. Scutellar hairs sparse, longest about $0.9 \times$ MOD (northern) to $0.9 \times$ EL (southern). Longest anepisternal hairs 0.55 (northern) to 1.0 (Edwards Plateau) \times MOD; longest katapisternal hairs about

0.6–0.7 × longest anepisternal hairs. Propodeum with sparse erect hairs across base and on side, longest hairs about 0.6 (northern) to 1.0 (Edwards Plateau) × MOD. Petiole with numerous erect hairs on sides and crest. Gastric terga with numerous erect hairs, most of which, on first two segments, arise from coarse poriform punctures; longest hairs on disc of second segment from 0.5 (northern) to 1.0 (Edwards Plateau) × MOD. Scape, femora and tibiae with abundant short, suberect to erect hairs, longest on hind tibia equal to, or slightly exceeding, minimum thickness of tibia. Fore and hind wings without fringe hairs on apical or posterior margins.

Integument: Cephalic integument similar to that of worker but clypeus duller, distinctly shagreened; malar area closely punctate with micropunctures and somewhat ovoid coarse punctures. Mesoscutum densely micropunctate and with sparse coarse punctures over entire disc or with impunctate median area of variable extent; parapsis uniformly, closely micropunctate. Scutellum uniformly micropunctate, interspaces usually greater than a puncture diameter, and with sparse coarse punctures. Anepisternum slightly shiny, densely shagreened, obscurely micropunctate and with scattered coarse punctures; katapisternum duller, densely micropunctate and with sparse coarse punctures. Propodeum dull or slightly shiny, densely shagreened and micropunctate, with sparse coarse punctures on basal face and sides; lower half of posterior face smooth and shiny. First four gastric terga moderately shiny, uniformly densely micropunctate, with sparse, coarse, poriform punctures; no impunctate median areas.

Color: Head and thorax ferruginous; propodeum, petiole and gaster medium to dark brownish; scape ferruginous, flagellum light brownish; legs ferruginous to brownish. Wings slightly brownish, veins and stigma light yellowish brown.

MALE. Measurements. HL 0.97–1.10; HW 0.93–1.07; SL 1.17–1.37; WL 2.1–2.6; PW 1.3–1.6.

Head: A little longer than broad to a little broader than long, CI 93–102, distinctly shorter than scape, SI 117–141; in frontal view, sides straight or slightly concave, slightly convergent toward mandibular insertions. Occiput, in frontal view, strongly but evenly convex, slightly angulate at sides. Eye large, OMD 0.75–0.90 × EL; OOD 1.67–2.80 × OD; IOD 2.00–3.20 × OD. Apical margin of mandible usually with low preapical tooth.

Thorax: Robust to very robust, PW 0.49–0.67 × WL. Propodeum without distinct basal face, in profile more or less evenly convex from base to apex.

Petiole: Low, strongly cuneate, summit usually sharp but may be narrowly rounded; crest, in frontal view, narrowed above, distinctly, angularly incised.

Vestiture: Cephalic pubescence dilute, densest on frontal lobes, malar area and occiput. Pubescence short, dilute on pronotum, scutum and scutellum; long, dilute

on mesopleura, metapleura and propodeal side; long, denser, across base of propodeum. First three terga conspicuously, but thinly, pubescent; remaining terga with scattered pubescence.

Malar area with 6–10 erect hairs, longest about 0.6 × MOD. Longest occipital hairs about 0.75 × MOD. A few short erect hairs on face between eye and frontal lobe. Longest scutal hairs 0.70–0.80 × MOD; scutellar hairs longer than those of scutum, some 1.0 × EL. Pleural hairs sparse, long, longest 0.9–1.1 × MOD. Long hairs across base of propodeum about equal to MOD. Sides and crest of petiole with numerous short hairs, about 0.5 × MOD. Disc of first tergum, behind summit with erect hairs sparse, those at summit about 0.75 × MOD; disc of second tergum similarly sparsely hairy or wholly apilose, but with usual row along apical margin and with sparse hairs along length at sides, where they are about 0.8 × MOD; apical segments with long hairs abundant, longest exceeding EL. Scape, femora and tibiae with abundant suberect to erect short hairs, longest hairs of hind tibia about equal to apical thickness of tibia. Fore and hind wings without fringe hairs on apical and posterior margins.

Integument: Head moderately shiny, distinctly shagreened, with sparse obscure micropunctures, and a few coarse punctures, occiput duller, more densely and sharply micropunctate. Mesoscutum dull, densely and uniformly shagreened with sparse, obscure micropunctures and scattered coarse punctures; scutellum shinier, less closely tessellate than scutum, with similar punctation. Mesopleura slightly shiny, ketepisternum duller and more densely shagreened than anepisternum, both sparsely micropunctate and with scattered coarse punctures. Propodeum shinier than pleura, shagreening less dense, micropunctures equally sparse but more distinct, especially basally; discal area shinier. First two terga slightly shiny, sharply shagreened and sparsely micropunctate, with scattered coarse punctures basally and laterally; remaining terga shinier, less closely shagreened, micropunctures and coarse punctures sparser.

Color: Blackish brown, antennae and legs medium brown. Wings faintly brownish, veins and stigma yellowish brown.

Terminalia: Figures 167, 179, 187.

Type Material. *Myrmecocystus melliger* subsp. *mendax*: an unspecified number of cotypes of all castes from Mt. Washington, near Colorado Springs, Colorado, July 19, 1903 (W. M. Wheeler). Lectotype worker, by present selection, agreeing with above general description and parenthetical data, in AMNH; lectoparatypes, all castes in AMNH, LACM, MCZ.

Myrmecocystus melliger subsp. *orbiceps*: an unspecified number of worker and female cotypes from Bull Creek, near Austin, Texas (Brues, Melander and Wheeler). Lectotype worker, by present selection (HL

1.85, HW 1.85, SL 2.25, WL 2.85, PW 1.25 mm), agreeing with above general description and Edwards Plateau specifics, in AMNH; lectoparatypes in AMNH, LACM, MCZ.

Distribution. Central Colorado south to Texas, west to desert mountain ranges of southeastern California; adjacent northern Mexico (Fig. 362).

Localities. UNITED STATES. Colorado: Yuma Co.: Wray, 3700', 17-19 Aug. 1919 (AMNH); [1.5 mi S Beecher Isl., 3600', 2 Sept. 1955 (R. E. Gregg), Gregg, 1963]. *Washington Co.:* [Akron, 4654', 28 May 1949 (R. E. Gregg), Gregg, 1963]. *Denver Co.:* Denver, 28 July 1906 (W. M. Wheeler; MCZ); [same locality, no date (W. W. Robbins), Gregg, 1963]. *El Paso Co.:* Mt. Washington, nr. Colorado Springs, 19 July 1903 (W. M. Wheeler; cotypes of *M. melliger mendax*; AMNH, LACM, MCZ); Colorado Springs, 5900', 23 Aug. 1967 (R. R. Snelling, No. 67-264; LACM). *Fremont Co.:* 5 mi NE Canyon City, 5700', 24 Aug. 1967 (R. R. Snelling, No. 67-264; LACM); [Canyon City, 5333', 4-5 July 1947 (R. E. Gregg); Royal Gorge, 6600', 5 July 1947 (R. E. Gregg), Gregg, 1963]. *Pueblo Co.:* Pueblo, no date (T. Pergande Colln., No. 510; USNM); [Vineland, 4600', 31 June 1947 (R. E. Gregg), Gregg, 1963]. *Otero Co.:* [Higbee, 4400', 1-2 June 1947 (R. E. Gregg), Gregg, 1963]. *Huerfano Co.:* [6 mi SW Walsenburg, 6450', 24 Sept. 1960. Gregg, 1963]. *Mesa Co.:* 4 mi S Fruita, 4700', 13 June 1955 (R. E. Gregg; LACM, REG). *La Plata Co.:* Bondad, 6100', 27 June 1919 (AMNH). *Baca Co.:* Regnier, 4500', 6-9 June 1919 (AMNH). *Las Animas Co.:* [5.5 mi N Trinidad, 6100', 23 Sept. 1960. Gregg, 1963]. *Texas: Travis Co.:* West Bull Cr., near Austin, 17 Apr. 1901 (W. M. Wheeler; cotypes *M. melliger orbiceps*; AMNH, LACM, MCZ); 6 mi W Austin, 21 Apr. 1903 (W. M. Wheeler; CU). *Sutton Co.:* Sonora, 2100', 26 Apr. 1964 (LACM). *Edwards Co.:* Barksdale, no date (W. M. Wheeler; GCW, MCZ, USNM). *Comal Co.:* New Braunfels, 26 July 1942 (W. S. Ross; CAS). *Bexar Co.:* Helotes, 1 July 1917 (CU, MCZ). *Hays Co.:* nr. Wimberley, 900', 19 Apr. 1973 (R. R. Snelling, No. 73-40; LACM). *Williamson Co.:* Cedar Park, 18 June 1951 (G. C. & J. Wheeler, No. Tex-175; GCW). *New Mexico: Colfax Co.:* [5 mi S Raton Pass, 6400'; 16 mi E Raton, 6650'; 20 mi W Raton, 6950'; Cimarron Cyn., 6700'. Cole, 1954]. *San Miguel Co.:* [25 mi S Las Vegas, 5500'. Cole, 1954]. *Santa Fe Co.:* Santa Fe, 19 June 1909 (F. C. Pratt; MCZ, USNM); same locality, 7000', 26 July 1968 (R. R. Snelling, No. 68-119; LACM); [10 mi S Santa Fe, 6500'. Cole, 1954]; 1 mi S Golden, 6 Aug. 1972 (C. A. Kay; CAK, LACM). *McKinley Co.:* [nr. Gallup (Kit Carson Cave Rd., 6950'); 25 mi E Gallup, 7200'. Cole, 1954]. *Quay Co.:* [9 mi W Glenrio, 3900'; 3 mi W Tucumcari, 4200']. *Guadalupe Co.:* 0.6 mi N Dilia, 4800', 21 Aug. 1967 (R. R. Snelling, No. 67-263; LACM); [Santa Rosa, 4650'. Cole, 1954]. *Torrance Co.:* [9 mi E Mountain Air, 6025'. Cole, 1954]. *Lincoln Co.:* [Malpais Lava Beds, nr. Carizozo. Cole, 1954]. *Socorro Co.:* [Water Cyn., 6550', 16 mi W Socorro; 25 mi E (5950'), 25 mi N (6550') Bernardo. Cole, 1954]. *Catron Co.:* Datil, 4 Aug. 1927 (W. S. Creighton; LACM); [20 mi E Alma, 6400'. Cole, 1954]. *Lea Co.:* [Hobbs, 3750'; N. Mex.-Tex. line, Hwy. 180-62. Cole, 1954]. *Otero Co.:* Alamogordo, 16 Apr. 1902 (MCZ); White Sands, 3 May 1960 (J. Durkin; USNM). *Doña Ana Co.:* vic. Aguirre Spg. Rec. Area, 12 & 21 May 1972 (C. A. Kay; CAK, LACM); [Las Cruces, 2750'. Cole, 1954]. *Luna Co.:* [6 mi NW Deming, 4550'. Cole, 1954]. *Grant Co.:* 26.5 mi S Silver City, 5900', 7 Sept. 1972 (R. R. Snelling, No. 72-66; LACM); 23 mi SW Silver City, 6100', 7 Sept. 1972 (R. R. Snelling, No. 72-68; LACM); [20 mi N (6400'), 70 mi N (7200'), 15 mi

E (6900') Silver City. Cole, 1954]. *County unknown:* "Rito de los Frijoles," no date (CKL. = T.D.A. Cockerell?; MCZ). *Arizona: Coconino Co.:* Oak Creek Cyn., nr. Sedona, 22 Aug. 1964 (G. C. & J. Wheeler, No. Ariz-48; GCW). *Yavapai Co.:* Ash Fork, 8 May 1905 (W. M. Wheeler; GCW, MCZ); 17 mi SE Camp Verde, 7 Aug. 1969 (R. R. Snelling; LACM); Rimrock, 9 Apr. 1968 (D. E. Surber, USNM). *Graham Co.:* Post Cyn., 5000-6000', Pinaleno Mts., 16 July 1917 (W. M. Wheeler; MCZ). *Cochise Co.:* S. Fork, Cave Cr. Cyn., Chiricahua Mts., 24 May 1964 (L. M. Martin; LACM); 0.5 mi S Paradise, 5500', 15 Aug. 1967 (R. R. Snelling, No. 67-228; LACM); Southwest Research Sta., 5400', 4 Aug. 1970 (V. Roth; LACM); Portal, July 1974 (B. Hölldobler; MCZ); Chiricahua Mts., 25 Aug. 1959 (G. C. & J. Wheeler, No. Ariz-6; GCW); Texas Pass, Dragoon Mts., 20 July 1917 (W. M. Wheeler; MCZ); Dry Cyn., 5000', Whetstone Mts., 21 Aug. 1951 (W. S. Creighton; LACM); Garden Cyn. (5400'), Carr Cyn. (5200-7100'), Miller Cyn. (5000-6100'), Coronado Peak (6600-6875'), Huachuca Mts., numerous dates and collectors (AMNH, GCW, LACM, MCZ, USNM); 8.1 mi SE Sunnyside, 5950', 23 Aug., 13 Sept. 1971 (R. R. Snelling, Nos. 71-48, 71-55; LACM). *Pima Co.:* Oracle, 4500-5000', various dates (W. M. Wheeler; GCW, MCZ); Apache Camp, 5500', Santa Catalina Mts., 27 July 1917 (W. M. Wheeler; GCW, MCZ); Fenner Cyn., 3000', Santa Catalina Mts., 19 Mar. 1919 (W. M. Wheeler; GCW, MCZ); Sabino Cyn., 3800', Santa Catalina Mts., 8-20 July 1916 (MCZ); same locality, 17 July 1950 (W. S. Creighton; LACM); Baboquivari Cyn., 3500', Baboquivari Mts., 26 July 1951 (W. S. Creighton; LACM); mouth of Madera Cyn., 4800', Santa Rita Mts., 24 June 1951 (W. S. Creighton; LACM). *Santa Cruz Co.:* Madera Cyn., Santa Rita Mts., 1-6 Aug. 1965 (R. H. Crandall; LACM); same locality, 16 Apr. 1948 (R. E. Gregg; LACM, REG); Sweetwater, 5800-6000', Santa Rita Mts., 28-29 June, 1951 (W. S. Creighton; LACM). *Nevada: Nye Co.:* A.E.C., N.T.S., Mercury, various dates and collectors (LACM). *Clark Co.:* 1 mi NW Granite Spgs., Dead Mt., "2-4-1953" (I. LaRivers; USNM); 3 mi E Nelson, 2200', 11 Apr. 1964 (R. C. Bechtel; LACM). *California. San Bernardino Co.:* Carson's Well, 1900', Turtle Mts., 31 Jan. 1967 (R. R. Snelling; LACM); 7 mi S, 34° E Kelson, 15 Apr. 1962 (UCB). *Riverside Co.:* 24 mi E Mecca, 13 Apr. 1965 (D. Veirs; UCB); Shaver's Well, Mecca Hills, 13 Apr. 1963 (R. R. Snelling; LACM); Hidden Spgs., Little San Bernardino Mts., no date or collector (T. W. Cook Colln.; LACM); Painted Cyn., 8 Mar. 1930 (USNM); Mecca Hills, 9 Mar. 1930 (USNM). *MEXICO. Chihuahua:* Nogales Ranch, 5200', Sierra de en Medio, 3 Oct. 1951 (W. S. Creighton; LACM). *Sonora:* 4.8 mi S Cananea, 1 Aug. 1970 (V. Roth, LACM); Puerto Gonzalitos, 2500', 9 Nov. 1952 (W. S. Creighton; LACM); Naco, 5100', Sierra de San José, 17 Aug. 1951 (W. S. Creighton; LACM).

Ecology. Wheeler (1908) reported briefly on the type colony of *mendax*. Sexual forms were found emerging and taking flight at 4:10 P.M. following a rain shower. On the following day the nest was excavated. Since repletes were not found, but insect fragments were found in some chambers, Wheeler concluded the species to be carnivorous.

Colonies in Colorado were reported on by Gregg (1963), who found that crateriform tumuli may or may not be present. Nests may be situated beneath stones and there is apparently a preference for clay soils. He found the species at elevations ranging from 3600-

6600', in the Upper Sonoran, mostly in Piñon-Cedar Woodland and Short Grass Prairie. Texas records include Piñon-Oak Savannah and Mesquite-Acacia Savannah. In other states it has been taken in Piñon-Juniper Woodland, Grama-Tobosa Shrubsteppe and Oak-Juniper Woodland.

The foraging behavior is much as that of *melliger*, already described and need not be elaborated here. Foraging is diurnal and the workers are active scavengers of dead arthropods and predators of living arthropods. Foragers of the colony observed near Wimberley, Texas, were seen to bring seven medium-sized (up to 25 mm) lepidopterous larvae in a period of 20 min. Other prey included one freshly killed muscoid fly, one dessicated muscoid and several fragments from an acridid, apparently recently dead. That workers also gather nectar and/or honeydew is attested by the presence of repletes in nests studied in Texas and Arizona.

The ant cricket *Myrmecophila nebrascensis* Luger has been found in one nest observed 8.1 mi SE Sunnyside, Cochise Co., Arizona.

Wheeler observed a mating flight of this species at Mt. Washington, Colorado on 18 July 1903, already mentioned above. A flight was observed by Creighton in the Baboquivari Mts., Arizona, on 26 July 1951. His notes state simply . . . "Both ♀s & ♂s present. They take no notice of each other and take off singly. The usual excitement among the workers." There had been a thunder shower about noon of the day before. Activity of the reproductives is summarized in Table 1.

Discussion. Although *orbiceps* has page priority over *mendax*, I have chosen, as first reviser, to continue usage of *mendax*. The name *orbiceps* has been the object of a singularly calamitous history and to resurrect it would only create further confusion. The name has been in synonymy for twenty years and is, in my opinion, best left there.

Wheeler (1908) described *orbiceps* as a subspecies of *melliger* characterized by the presence of workers with orbiculate heads and the absence of repletes. He had numerous specimens available from Texas, New Mexico and Arizona; the type series was from Bull Creek, near Austin, Texas. His description and figures leave no room for doubt as to the identity of the insect being described. On a subsequent page of the same paper *mendax* was adequately described, also as a subspecies of *melliger*.

In the years following, the concepts of these forms remained fairly consistent although Creighton (1950) predicted that *orbiceps* would ultimately be shown to be a synonym of *melliger*. The conceptual *melliger*, as established by Wheeler and Creighton was not the same as Forel's ant; it was, in fact, misidentified samples of *orbiceps* in which there were no workers with orbiculate heads, but did include some material of *mendax*. Creighton and Crandall (1954), reporting a monumental nest excavation by Crandall, were able

to show that the form with orbiculate heads did, indeed, produce repletes. They therefore placed *orbiceps* in synonymy with *melliger*.

Snelling (1970) reviewed the *melliger* group species. The concept of *melliger*, based on an examination of Forel's types, was clarified and Wheeler's *comatus* placed in the synonymy of that form and the status of *mendax*, as a valid species, was somewhat clarified. There is, however, no excuse for his treatment of *orbiceps*, for that name was placed in the synonymy of Forel's *placodops*. Type material of both was at hand for direct comparison, but no such comparison was made, simply because the concept as to the identity of *orbiceps* was exceptionally clear and it was obvious that *placodops* fits that concept perfectly.

It was with considerable chagrin, therefore, that I discovered that the types of *orbiceps* are not "*orbiceps*" at all. They no more match Wheeler's description and figures of *orbiceps* than does the long-haired variant of *mendax*. In fact, they are the long-haired variant of *mendax*. Wheeler apparently wrote up his description and then selected his best set of specimens as types and never realized that they were not conspecific. The subsequent identity of *orbiceps* has been based on the concept created by the description and figures, a concept which could not include the types. Because of the confused identity of *orbiceps* and because of the inappropriate nature of that name to the present species, I feel that continued use of *mendax* is fully justified.

This species is very closely related to both *melliger* and *placodops*. Erect body hairs are subject to much variation through the entire range of the species and have been a source for confusion in the past and for frustration to the present writer.

Samples from Colorado, northern New Mexico and Arizona, Nevada and California differ greatly from those of Texas and southern New Mexico and Arizona. In large workers of the northern, short-haired form, the longest hairs of the pronotum are $0.58-0.60 \times$ the MOD and the longest discal hairs of the second tergum are about $0.65-0.68 \times$ the MOD. From the Edwards Plateau of central Texas to the mountains of southern Arizona a distinctive, long-haired form predominates, but does not wholly replace "normal" *mendax*. In the large workers of this form, hairs are shortest in samples from the Edwards Plateau. The longest pronotal hairs are $0.70-0.75 \times$ the MOD and the long discal hairs of the second tergum $0.75-0.80 \times$ the MOD. Westward from the Edwards Plateau, hair length increases to an extreme condition present in samples from the mountains of southern Arizona. Here the pronotal hairs may be up to $1.30 \times$ the MOD and the discal hairs of the second tergum up to $1.15 \times$ the MOD.

Much the same situation applies in a north to south cline, for, distinctive as these extreme short-haired and long-haired forms are, they are perfectly intergradi-

ent to one another. There is no question, in my mind, of two species being represented, nor that the southern form can be set up as a subspecies: the cline is too fully developed. Furthermore, in the mountains of southern New Mexico and Arizona there are nests in which all, or most, of the larger workers are much more like the northern form. A single sample is available from Chihuahua (Nogales Ranch, Sierra de en Médio). In the large workers the long pronotal and discal hairs of the second tergum are $0.65 \times$ the MOD. The single specimen from Cananea, Sonora, is a medium-sized worker but appears to be of the short-haired form, as seems true of the small workers from Puerto Gonzalitos.

The closely related species *placodops*, which ranges from western and southern Texas to southern Arizona, is a short-haired ant. It is broadly sympatric with *mendax*. Workers differ most conspicuously from those of *mendax* in the shorter hairs; in large workers, the long pronotal hairs are about $0.46\text{--}0.48 \times$ the MOD, as are those of the second tergum. There appears to be little variation in this regard in *placodops*, western populations being very similar to those of Texas in hair length.

The great range of variation noted for *mendax* was very troublesome, especially since it closely approached the accentuated hair length of *melliger*. It became evident, finally, that those populations of *mendax* with long hair were those adjacent to, or sympatric with, the closely related *placodops*. I can only hypothesize that *mendax* is exhibiting character displacement against *placodops*.

As I interpret the situation, *mendax* and *placodops* may both be derived from a form very much like the present *melliger*. I also assume that *placodops* diverged at an earlier period and is now genetically more stable than *mendax*. The short-haired condition of *mendax* appears to be inhibited in those areas where it is adjacent to, if not actually sympatric with, *placodops*. Interestingly, the few specimens from northern Mexico, in areas where the range of *mendax* becomes sympatric with *melliger*, show an apparent reversal of the long-haired trend in *mendax*. In these, displacement against *melliger* produces short-haired *mendax*. Clearly, more field work must be done, particularly in northern Mexico. An effort should be made to delimit areas of *melliger-mendax* sympatry and to study the populations of these areas.

There has been some confusion in the past of the long-haired variant with *comatus*, a synonym of *melliger*. The New Mexico records cited by Cole (1954) and those from Colorado in Gregg (1963) as *comatus* are based on long-haired populations of *mendax*. Even more remarkable, perhaps, is the record of *mendax* from Hidden Springs Canyon, San Bernardino Co., Calif., recorded as *Formica subpolita camponoticeps* Wheeler by Cook (1953). This is merely another example of that author's complete lack of taxonomic ability.

Myrmecocystus (Endiodictes) placodops Forel

Figures 52–60, 156, 168, 180, 188

Myrmecocystus melliger var. *placodops* Forel 1908. Bull. Soc. Vaud. Sci. Nat. (5) 44:70. ♀.

Myrmecocystus melliger, Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:348 (in part); Wheeler 1912. Psyche 19:174–175 (in part); Smith 1936. Jour. N. Y. Entomol. Soc. 44:169 (misident); Creighton 1950. Bull. Mus. Comp. Zool. 104:442, 444–445 (in part); Creighton and Crandall 1954. Biol. Rev., C.C.N.Y. 16:2–6 (misident.).

Myrmecocystus melliger subsp. *orbiceps* Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:349, Fig. 3 (in part); Wheeler 1912. Psyche 19:173 (in part); Smith 1936. Jour. N. Y. Entomol. Soc. 44:170 (in part); Cole 1937. Entomol. News 48:139 (in part); Creighton 1950. Bull. Mus. Comp. Zool. 104:442, 445 (in part).

Myrmecocystus placodops, Snelling 1969. Contr. Sci., L.A. Co. Mus. Nat. Hist. 170:6, 7, 8 (in part).

Diagnosis. Worker: HW 0.8–2.3 mm; head distinctly orbiculate in large workers; longest hairs of pronotum and disc of second tergum no more than $0.50 \times$ MOD; long pronotal hairs abruptly tapering near tip; malar area with numerous erect hairs. *Female.* HW in excess of 2.00 mm; malar area with numerous fully erect hairs; hairs of occiput and mesoscutum less than $0.7 \times$ MOD; discal hairs of second tergum less than $0.5 \times$ MOD. *Male.* Apparently inseparable from those of *melliger* and *mendax*.

WORKER. Measurements. HL 1.10–2.37 (2.10); HW 0.80–2.30 (2.30); SL 1.40–2.15 (2.10); WL 1.7–3.1 (3.1); PW 0.7–1.4 (1.4).

Head: In small workers longer than broad to broader than long in largest worker, CI 81–109 (109); shorter than scape in small workers to longer than scape in large workers, SI 93–135 (100); sides straight and barely convergent toward mandibular insertions in smallest workers; in largest workers, margins slightly divergent down to about level of antennal sockets then abruptly convergent toward mandibular insertions through a slight, but distinct angle at the level of the antennal sockets. Occiput, in frontal view, gently and evenly convex from side to side in small workers, flat or slightly concave in largest workers and broadly rounded at sides. Eye small, $0.92\text{--}1.17 \times$ first flagellomere; OMD $1.50\text{--}2.29$ (2.22) \times EL. Mandible with seven teeth.

Thorax: Slender to robust, PW 0.35–0.46 (0.44) \times WL. Propodeum, in profile, a little longer than high, basal face flat or barely convex, broadly rounded into posterior face.

Petiole: In profile, thick-cuneate, slightly higher than long to distinctly higher than long, summit narrowly to broadly rounded; crest, in frontal view, flat or slightly convex, rarely weakly concave, never distinctly notched.

Vestiture: Cephalic pubescence very sparse, virtually absent from occipital sides, gena and malar area (except adjacent to mandibular base), most conspicuous