

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 (Endiodioctes) 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

on frontal lobes, vertex and center of occiput. Pubescence more abundant on thorax, especially on side and propodeum, but only partially obscuring surface. First three terga closely pubescent, fourth tergum sparsely pubescent in large workers, often apubescent in small workers.

Malar area with 12+ erect, short hairs; longest occipital hairs 0.57 (small workers) to 0.70 (large workers) \times MOD; a few short, erect hairs near inner eye margin; some hairs of vertex, occiput and malar area arising from coarse poriform punctures. Longest pronotal hairs no more than 0.50, usually 0.43–0.46 \times MOD, hairs straight, often blunt or abruptly tapering at tip; mesonotal hairs usually about half as long as longest pronotal hairs; base and side of propodeum with numerous erect hairs which are shorter than longest pronotal hairs; side and crest of petiole with abundant erect hairs about equal to those of propodeum. Gaster with abundant erect hairs arising from coarse poriform punctures, those on disc of second tergum no more than 0.5 \times MOD; hairs longer on apical segments and on sterna. Scape with numerous subdecumbent to erect, short hairs, except on inner face; all femora and tibiae with abundant short subdecumbent to erect hairs, longest on hind tibia about equal to minimum tibial thickness.

Integument: Head moderately shiny; lightly shagreened, more sharply so on clypeus, frontal lobes and malar area near base of mandible; shinier and less distinctly shagreened on occiput, frontal lobes densely micropunctate and with scattered coarse punctures, punctures somewhat obscured by dense shagreening; face between eye and frontal lobe without evident micropunctures at 125 \times , or with a few near eye margin; malar area with scattered weak, fine punctures and setigerous poriform punctures; vertex with abundant obscure micropunctures in ocellar area which extend onto occiput; occipital micropunctures usually limited to area immediately posterior to ocelli, rarely extended somewhat laterad; occiput with scattered setigerous poriform punctures. Thorax slightly shiny, densely shagreened, closely micropunctate, propodeum duller. First three terga moderately shiny, closely micropunctate and with sparse setigerous poriform punctures, minor workers less closely micropunctate on third tergum; fourth tergum shinier, with scattered micropunctures and coarse punctures.

Color: Head and thorax light to medium ferruginous, gaster blackish; thorax and legs often extensively infuscated, especially in small workers.

FEMALE. Measurements. HL 2.20; HW 2.33; SL 2.13; WL 5.1; PW 3.0.

Head: Slightly broader than long, CI 106; in frontal view, sides nearly straight, distinctly convergent below; a little longer than scape, SI 97. Occiput, in frontal view, slightly convex, broadly and evenly rounded onto gena. Eye small, 0.88 \times first flagellomere; OMD 1.73 \times EL; OOD 4.7 \times OD; IOD 3.0 \times OD. Mandible with

seven teeth. Penultimate segment of maxillary palp slender, broadest at basal third, evenly tapering to apex.

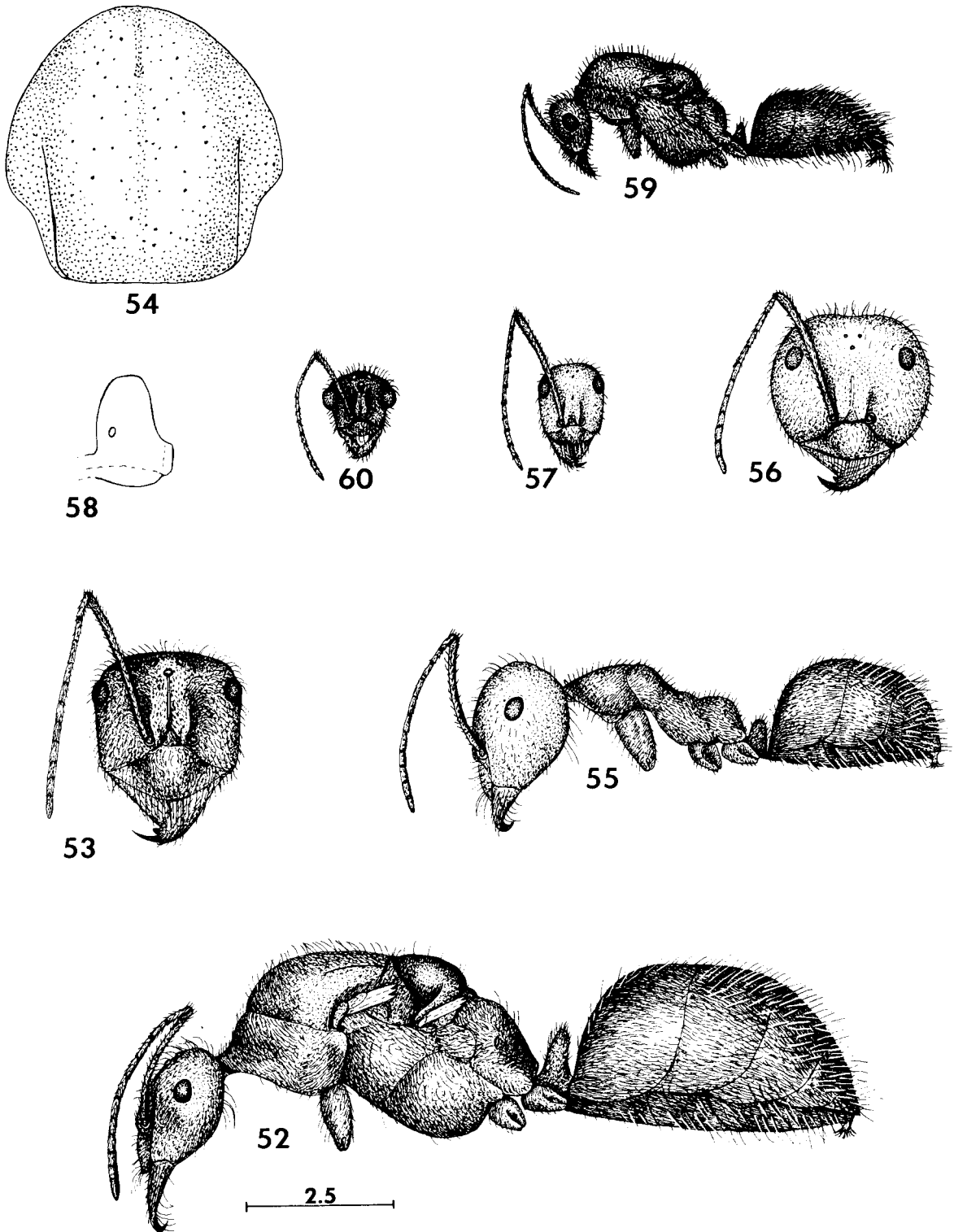
Thorax: Robust, PW 0.59 \times WL. Scutum flattened behind; scutellum convex in profile, slightly flattened anteriorly. Basal face of propodeum strongly sloping and broadly rounded onto posterior face.

Petiole: In profile, moderately thick, cuneate, summit slightly convex; crest, in frontal view, broadly, angularly incised.

Vestiture: Cephalic pubescence general but sparse, densest on occiput and near base of mandible. Mesoscutum with pubescence very sparse, a little more abundant across anterior margin, conspicuous only on parapsis; general but sparse on scutellum. Pubescence longer, more abundant on pronotum, pleurae and propodeum, but partially obscuring surface only on latter. First four terga uniformly and densely pubescent.

Malar area with 15+ erect hairs, longest less than 0.5 \times MOD; a few short hairs along inner eye margin, but area between eye and frontal lobe otherwise without erect hairs; longest occipital hairs about 0.6 \times MOD. Mesoscutum with numerous erect hairs of nearly uniform length, longest about 0.5 \times MOD. Scutellar hairs sparser than on scutum, longest about 0.8 \times MOD. Longest anepisternal hairs about 0.8 \times MOD, hairs sparse; katapisternum similar. Propodeum with hairs sparse on side, more abundant across base, longest about 0.6 \times MOD. Petiole with numerous erect hairs on side and across crest. Gastric terga with numerous subdecumbent to suberect (a few fully erect, especially on first tergum) hairs, most of which, on first three terga, arise from poriform punctures; longest hairs on disc of second segment about 0.4 \times MOD. Scape, all femoral and tibial surfaces with abundant short, suberect to erect hairs, longest on hind tibia about equal to minimum tibial thickness. Fore and hind wing without fringe hairs on apical or posterior margins.

Integument: Head slightly shiny, more densely shagreened than that of worker, clypeus dull; malar area dull, minutely roughened and with scattered fine punctures which become dense near mandibular base; face between eye and frontal lobe with numerous fine punctures which are largely obscured by dense shagreening; frontal lobes densely, finely punctate, some punctures ovoid; micropunctures of vertex, laterad of ocelli, separated by about a puncture diameter, denser between and behind ocelli; micropunctures sparser on occiput, especially laterad. Mesoscutum shiny, with micropunctures abundant only along anterior margin, disc with very scattered micropunctures and scattered coarse punctures, but with a median line of sparse micropunctures in otherwise impunctate median area; parapsis uniformly, densely micropunctate. Anepisternum closely micropunctate, interspaces slightly shiny and lightly shagreened; katapisternum similar but



FIGURES 52–60. *M. placodops*. 52, female, lateral view; 53, head of female, frontal view; 54, mesoscutum of female, distribution of punctures; 55, major worker, lateral view; 56, head of major worker, frontal view; 57, head of minor worker, frontal view; 58, petiole of major worker, lateral view; 59, male, lateral view; 60, head of male, frontal view.

more closely punctate. Propodeum slightly shiny, densely shagreened and closely micropunctate, with scattered coarse punctures on side and across base; lower half of posterior face smooth and shiny. First four gastric terga slightly shiny, uniformly, densely micropunctate, with scattered poriform punctures on first three, fourth with scattered coarse punctures; no impunctate median areas.

Color: Head ferruginous; thorax and appendages mostly brownish ferruginous; gaster medium brownish. Wings slightly brownish, veins and stigma light brown.

MALE. Measurements. HL 0.92–1.00; HW 0.90–0.97; SL 1.00–1.27; WL 2.2–2.3; PW 1.2–1.4.

Head: Slightly longer than broad, CI 97–98; distinctly shorter than scape, SI 109–127; in frontal view, sides straight, slightly convergent toward mandibular insertion. Occiput, in frontal view, evenly convex from side to side. Eye large, OMD 0.75–0.84 × EL; OOD 2.27–2.40 × OD; IOD 2.33–2.95 × OD. Apical margin of mandible without preapical tooth.

Thorax: Robust to very robust, PW 0.54–0.62 × WL. Propodeum, in profile, without evident basal face.

Petiole: In profile, thick, weakly cuneate, summit broadly rounded to sharply angular; in frontal view, crest with distinct angular incision.

Vestiture: Cephalic pubescence dilute, most conspicuous on frontal lobes. Pubescence general but thin on thorax, more abundant on pleura and propodeum. First three terga conspicuously, but thinly, pubescent; fourth tergum less pubescent, remaining terga with only scattered pubescence.

Malar area with about 10 erect hairs, longest about 0.6–0.7 × MOD. Longest occipital hairs about 0.6 × MOD. A few short, fine, erect hairs between eye and frontal lobe. Longest scutal hairs about 0.9 × MOD; scutellar hairs sparser, longest about 1.0 × MOD. Pleural hairs sparse, longest (on katapisternum) about 0.7 × MOD. Longest hairs across base of propodeum about 0.8 × MOD. Sides and crest of petiole with numerous short, erect hairs, longest about 0.3–0.4 × MOD. First three terga with broad median area free of erect hairs; erect hairs on side of second tergum about 0.3 × MOD; longest hairs on apical segment about equal to MOD. Scape, femora and tibiae with numerous short, fine, suberect to erect hairs, longest on hind tibia about equal to minimum thickness of tibia. Fore and hind wings without fringe hairs on apical or posterior margins.

Integument: Head moderately shiny, lightly shagreened, with sparse micropunctures and scattered coarse punctures. Mesoscutum slightly shiny, uniformly densely shagreened, with scattered micropunctures (obscured by shagreening) and coarse punctures; median area shinier and less sharply shagreened. Scutellum shiny, lightly shagreened, with sparse micropunctures and scattered coarse punctures. Mesopleura slightly shiny; anepisternum with sparse micropunctures and scattered coarse punctures which are obscured by dense shagreening; katapisternum shinier, less

sharply shagreened. Propodeum about as shiny as katapisternum, sparsely micropunctate and with scattered, obscure, coarse punctures; discal area smooth and shiny. First three terga slightly shiny, distinctly tessellate, with abundant, but well separated, micropunctures and sparse coarse punctures (except in broad median area); remaining terga more sparsely micropunctate.

Color: Blackish brown, antennae and legs medium brown; mandible and labrum yellowish. Wings very faintly brownish, veins and stigma light yellowish brown.

Type Material. Described from a unique worker major from an unknown locality in Mexico; type in MNHG.

Distribution. Rio Grande Valley and adjacent lowlands of Texas and Mexico, west to Sonora and Arizona (Fig. 362).

Localities. UNITED STATES. Texas: Hall Co.: 6 mi SE Turkey, 18 June 1970 (C. W. O'Brien; LACM). *Hale Co.:* Hale, 19 Oct. 1968 (B. W. Robertson; LACM). *Tom Green Co.:* San Angelo (AMNH). *Concho Co.:* 15 mi N Eden, 29 May 1969 (LACM). *Culberson Co.:* 14 mi E Kent, 22 Aug. 1958 (A. C. Cole, No. Tx-74; LACM). *El Paso Co.:* El Paso, 28 July 1914 (J. C. Bradley; CU, USNM); same locality, 14 Aug. 1908 (R. C. Pratt; USNM). *Menard Co.:* Menard, 22 May 1946, 24 May 1939 (R. Melvin; USNM). *Pecos Co.:* 12 mi S Ft. Stockton, 9 Dec. 1901 (W. M. Wheeler; AMNH). *Burnet Co.:* Marble Falls, 3 May 1902 (W. M. Wheeler; AMNH). *Bexar Co.:* San Antonio, various dates and collectors (AMNH, GCW, LACM, MCZ, USNM). *Medina Co.:* Hondo (J. D. Mitchell; AMNH, MCZ, USNM). *Val Verde Co.:* Juno, 3 July 1917 (CU); Del Rio, 1–2 June 1902 (W. M. Wheeler; AMNH, GCW); 10 mi E Del Rio, 2 July 1917 (USNM); Langtry, 3 June 1902 (W. M. Wheeler; AMNH, LACM, USNM). *Brewster Co.:* 21 mi E. Marathon, 13 Apr. 1949 (UK). *Uvalde Co.:* Uvalde, 14 Apr. 1952 (C. D. Michener, et al.; UK); same locality, 19 May 1918 (J. C. Bradley; CU). *Karnes Co.:* Kenedy, 27 Oct. 1904 (G. P. Goll; LACM). *Maverick Co.:* 16 mi E Eagle Pass, 500', 13 Apr. 1973 (R. R. Snelling, No. 73–5; LACM). *Victoria Co.:* Victoria, 8 July 1907 (J. D. Mitchell; LACM). *Refugio Co.:* Refugio, 29 Apr. 1909 (J. D. Mitchell, USNM). *Live Oak Co.:* Lake Corpus Christi State Park, 29 Nov. 1951 (W. S. Creighton; LACM). *La Salle Co.:* Cotulla, 8 Apr. 1908 (J. D. Mitchell; MCZ, USNM). *Dimmit Co.:* Catarina, 22 July 1955 (A. C. Cole, No. Tx-77; ACC). *Webb Co.:* Laredo, various dates and collectors (AMNH, LACM, USNM). *Zapata Co.:* San Ygnacio, 400', 10 Oct. 1951 (W. S. Creighton; LACM); Falcon State Park, 2 Apr. 1968 (W. S. Creighton; LACM). *Starr Co.:* nr. Roma, May, 1965 (A. E. Lewis; LACM); 10 mi S Sullivan City, 25 Oct. 1951 (W. S. Creighton; LACM). *Willacy Co.:* Raymondville, 20 Oct. 1943 (W. D. Buchanan; USNM). *Cameron Co.:* Boca Chica, 25', 14 Apr. 1973 (R. R. Snelling, No. 73–8; LACM). *Co. unknown:* Jones, 12 Oct. 1968 (A. B. Barbes; LACM). *New Mexico: Dona Ana Co.:* Hatch, 4100', 10 June 1951 (W. S. Creighton; LACM). *Arizona: Cochise Co.:* Portal, 30 Apr. 1973 (R. Duffield, Nos. 153, 175; LACM). *Maricopa Co.:* Phoenix, 1100', 24 Feb. 1933 (R. H. Crandall; USNM); Gila Bend Mts., 8 Aug. 1917 (W. M. Wheeler, GCW, MCZ). *Pinal Co.:* 30 mi W Casa Grande, 2 Dec. 1943 (E. S. Ross, CAS). *Pima Co.:* Tucson and vicinity, numerous dates and collectors (AMNH, LACM, MCZ, USNM); Sells, 2360', 11 Aug. 1959 (R. A. Alexander; USNM); 25 mi S Ajo, 21 Mar. 1932 (USNM); Hqrs., 1600', Organ Pipe Cactus Natl. Mon., 15 Mar. 1952 (W. S. Creigh-

ton; LACM); Abra Wash, 1300', Organ Pipe Cactus Natl. Mon., 22 Mar. 1952 (W. S. Creighton; LACM). *Yuma Co.*: 22 mi SSE Quartzsite, 5 May 1963 (R. R. Snelling; LACM); Palm Canyon, Kofa Mts., 4 May 1963 (R. R. Snelling; LACM). *MEXICO. Nuevo León*: Chinà, 600', 12 Mar. 1953 (W. S. Creighton; LACM). *Tamaulipas*. 15 N. Ciudad Victoria, 6 June 1951 (Univ. Kans. Mex. Exped.; UK); Guemez, 7 June 1961 (L. B. Carney, No. 10; UK). *Chihuahua*: Camargo (LACM). *Sonora*: 35 mi W Sonoita, 26 Nov. 1959 (V. Roth; USNM); 2 mi S Sonoita, 1300', 31 Oct. 1952 (W. S. Creighton; LACM); 4 mi S Santa Ana, 18 Aug. 1966 (R. J. Hamton; LACM, RJH); nr. Punta Chueca, 19 mi NW Bahía Kino, 3 Feb. 1972 (E. M. Fisher; LACM). *State unknown*: El Morál, Ciudad Porfirio Diaz, 7 June 1901 (S. F. Rangel; AMNH). *No specific data*: (type of *melliger* var. *placodops*; MNHG).

Ecology. This ant is most abundant in the Rio Grande Valley and plains of western Texas and has been taken in habitats ranging from Southern Cordgrass Prairie to Mesquite Savannah; the majority of records from this area are from Ceniza Shrub Grassland and Mesquite-Acacia Savannah. In the Panhandle region of Texas it occurs in Grama-Buffalo grass Grassland; in New Mexico records are from Creosote bush-Tarbrush Grassland and in Arizona primarily in Creosote bush-Bur sage Grassland.

The first report on this species was made by Wheeler (1908). The nest was stated to be "... always in stony soil, has the form of an obscure crater, with an irregular or arcuate and sometimes very large entrance (2-3.5 cm. in diameter) leading down obliquely into the soil. The main gallery thus formed breaks up at a depth of 20-30 cm. into short passages and flat, irregular chambers. The colonies are rather small, comprising hardly more than 300-500 individuals..." He

concluded that this is a "... highly predaceous and carnivorous ant..." which does not form repletes.

Parks (1929) observed *placodops* near San Antonio, Texas. A colony was exposed in a gravel pit near San Antonio. The nest was in excess of twelve feet deep; the first twelve feet were through a layer of coarse gravel and there were few galleries. At twelve feet it entered a layer of soft yellow sand; here chambers about 4" diameter \times $\frac{3}{8}$ " high contained numerous repletes. He found that foragers obtain nectar from *Condalia obovata* Hook, *Colubrina texensis* Gray and *Zizyphus obtusifolia* Gray, all Rhamnaceae. Chambers containing grass seeds were stated to have been found; this requires confirmation, even though Parks further stated that workers were often seen carrying seeds. It was found that coyotes dig into the nests, presumably to get at the repletes.

A much more ambitious excavation is reported by Creighton and Crandall (1954). Working near Tucson, Arizona, Crandall excavated a nest to a depth of over sixteen feet and secured over 1500 repletes and many hundreds of workers, including numerous individuals with orbiculate heads. These two observations of excavated nests thoroughly dispel Wheeler's thesis that the form with orbiculate heads does not produce repletes and that the colonies are small and shallow.

This is a very active diurnal species. In the field it is a conspicuous ant as it runs across open areas. In bright sunlight it appears silvery or glittering white. Although it is actively predaceous on other small arthropods, the workers of *placodops* also visit flowers for nectar. In addition to the records cited by Parks (1929), I have seen foragers on *Baccharis* and *Helianthus* (Asteraceae).

The available data on the reproductives are given in Table 2.

TABLE 2
Activity of Reproductives of:

| Locality | Date | Activity |
|-------------------------------|--------------|----------------|
| <i>M. placodops</i> Forel | | |
| TEX., Kenedy | 27 Oct. 1904 | ♂♂, ♀♀ in nest |
| ARIZ., Tucson | 2 Oct. 1953 | ♂♂ in nest |
| ARIZ., Tucson | 14 Oct. 1953 | ♂♂ in nest |
| <i>M. semirufus</i> Emery | | |
| CALIF., 2 mi S Pearblossom | 12 Feb. 1967 | ♂♂ in nest |
| CALIF., Deep Cyn. | 17 Mar. 1968 | ♂♂ in nest |
| CALIF., 4 mi W Lone Pine | 18 Mar. 1968 | ♂♂ in nest |
| CALIF., Llano | 11 Apr. 1952 | ♀♀ in nest |
| CALIF., Palmdale | 20 Apr. 1965 | ♂♂ in nest |
| <i>M. depilis</i> Forel | | |
| TEX., 37 mi SW Alpine | 19 Aug. 1967 | ♂♂ in nest |
| N.MEX., Truth or Consequences | 31 Mar. 1962 | ♂♂, ♀♀ in nest |
| N.MEX., Jornada Exp. Range | 24 Apr. 1973 | ♂♂ in nest |
| N.MEX., Jornada Exp. Range | 7 June 1972 | ♂♂, ♀♀ in nest |
| ARIZ., 5.3 mi NE Portal | 9 Mar. 1962 | ♂♂, ♀♀ in nest |
| ARIZ., 2.5 mi NE Portal | 4 Aug. 1959 | ♂♂, ♀♀ in nest |
| SLP., 6 mi W Cd. del Maiz | 11 July 1973 | ♂♂ in nest |

Discussion. The oldest name for this ant, *placodops*, is based on a single worker major from an unknown Mexican locality. Although Wheeler (1908) clearly intended his name *orbiceps* to apply to this form, that name, due to an unfortunate type series selection, must become a synonym of *mendax*.

Large workers with the characteristic orbiculate head are easily separated from those of the related species *melliger* and *mendax*. Workers of all sizes are further separated from those of *melliger* by the much shorter pilosity. Large workers differ from those of short-haired *mendax* populations by the shorter hairs on the pronotum and second tergum, which are less than $0.5 \times \text{MOD}$. In sympatric or adjacent populations of *mendax* these hairs are 0.75, or more, $\times \text{MOD}$. This usually applies to media and minor workers as well.

The wholly allopatric populations of *mendax* are much more similar to *placodops* but seem never to produce large workers with orbiculate heads. The erect hairs on the dorsum of the pronotum and on the second tergum, although short, are still longer than in *placodops*. The punctures of the frontal lobes are usually more regularly distributed and are sharper in *mendax* than in *placodops*. The latter species is somewhat variable and no great reliance may be placed in this character. Minor workers of these allopatric populations are essentially indistinguishable. There are no reliable features by which the sexual forms may be separated, based on the presently available, limited material.

Myrmecocystus (Endiodioctes) semirufus Emery

Figures 61–69, 157, 169, 181, 189

Myrmecocystus melliger var. *semirufa* Emery 1893. Zool. Jahrb. Syst. 7:667. ♀.

Myrmecocystus melliger subsp. *semirufus*, Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:355 (in part); Mallis 1941. Bull. So. Calif. Acad. Sci. 40:80 (in part).

Myrmecocystus semirufa, Creighton 1950. Bull. Mus. Comp. Zool. 104:449–450 (in part).

Myrmecocystus semirufus, Cook 1953. The ants of Calif.:345 (in part); Snelling 1969. Contr. Sci., L.A. Co. Mus. 170:5–6, 8.

Myrmecocystus placodops, Wheeler and Wheeler 1973. The ants of Deep Canyon:125–126 (misident.).

Diagnosis. Worker: Malar area with more than 10 erect hairs visible in frontal view; thorax abundantly hairy, erect hairs of promesonotum uniform in length, none more than $0.5 \times \text{MOD}$; head, thorax and appendages clear ferruginous. *Female:* Malar area, in frontal view with 10+ erect hairs; thorax exceptionally robust, PW $0.71 \times \text{WL}$; parapsis sparsely, coarsely punctate; median area of first two terga sparsely punctate in contrast to remainder of disc; penultimate segment of maxillary palp broader basally than apically. *Male:* Scutum and scutellum uniformly densely tessellate; first three terga uniformly densely pubescent and micropunctate; longest occipital hairs stiff, less than $0.50 \times \text{MOD}$.

WORKER: Measurements. HL 1.13–1.73 (1.20); HW 1.00–1.72 (1.12); SL 1.40–2.00 (1.53); WL 1.9–2.9 (2.1); PW 0.7–1.3 (0.85).

Head: Usually distinctly longer than broad, rarely slightly broader than long, CI 86–103 (93), distinctly shorter than scape, SI 110–131 (128); in frontal view, sides straight and only slightly convergent toward mandibular insertions to gently convex in large workers. Occiput, in frontal view, flat or very slightly convex, abruptly rounded onto sides. Eye small, $0.90\text{--}0.96$ (0.90) \times first flagellomere; OMD 1.60–2.10 (1.88) \times EL. Mandible with seven teeth.

Thorax: Slender to moderately robust, PW $0.37\text{--}0.46$ (0.40) \times WL. Propodeum, in profile, evenly curved from base to apex, without well defined basal and posterior faces.

Petiole: Thick in profile, not at all cuneate, summit broadly and evenly rounded; crest, from front, flat or slightly concave, without median notch; from above about 1.5 wider than long.

Vestiture: Pubescence moderately dense on vertex and occiput, sparse elsewhere on head; general on thorax, moderately dense, nowhere obscuring surface; dense on first three terga; fourth tergum sparsely pubescent in small workers, moderately pubescent in larger workers.

Malar area with more than 10 short, fully erect hairs; occiput with numerous short, straight, stiff, fully erect hairs, longest $0.59\text{--}0.64 \times \text{MOD}$; short, stiff erect hairs general elsewhere on head. Promesonotum with numerous uniformly short, stiff erect hairs, longest 0.5 or less $\times \text{MOD}$; propodeum with numerous similar hairs on all except posteriorly sloping face. Petiole with numerous short, erect hairs across summit and along sides. First four terga with abundant short, fine hairs, mostly arising from poriform punctures, longest on disc of second about 0.1 mm. Scape, all femoral and tibial surfaces with abundant short, stiff, suberect to erect hairs.

Integument: Head moderately shiny, lightly shagreened; vertex and occiput closely micropunctate and with sparse coarser punctures; frontal lobes with coarse, close punctures; front of head with scattered coarse punctures, sparser on malar area. Thorax dull, densely shagreened and micropunctate. First three terga closely micropunctate and with scattered coarse punctures; fourth tergum similar to third in large workers, shinier, finely shagreened and with scattered coarse punctures in small workers.

Color: Head, thorax and appendages clear ferruginous, gaster medium to dark brownish; legs sometimes slightly brownish.

FEMALE. Measurements. HL 1.90; HW 2.00; SL 1.97; WL 4.1; PW 2.9.

Head: A little broader than long, CI 105, sides straight, slightly convergent below; slightly shorter than scape, SI 103. Occiput, in frontal view, gently