mesoscutal hairs of *kennedyi* males are half, or more, as long as the MOD; the frons, the center of the mesoscutum and the parapsis are polished and shiny. Males of allopatric *mimicus* populations also have long pleural hairs, but those of sympatric populations are more difficult to separate. The pleural hairs appear to average longer in such *mimicus*, about 0.12 mm, while in *romainei* they are shorter, about 0.08 mm.

The color of the head and thorax of *romainei* workers varies from light to medium ferruginous in the samples from Oklahoma, Texas, New Mexico, Arizona and Utah. The samples from Selden, Kansas, and Las Lunas, New Mexico, are unusually dark. These approach the brownish ferruginous color of *mimicus* from the same area but may be recognized by the closely micropunctate frons, densely pubescent frons, occiput, promesonotum and third tergum and more pilose malar area.

The Selden series consists of 21 workers from a single nest. In this series, 16 (76%) have a CI or 90 or more. In a similar series from the type locality and a single nest, selected as randomly as possible, 14 (67%) possess CI of 89 or less. The sample from Kenton, Oklahoma, consists of a dozen individuals of which 10 (83%) have a CI in excess of 90. These samples are very limited, but it appears there may be a tendency toward relatively broader heads in northeastern samples.

Another variation involves large workers in samples from New Mexico and Texas. More specimens with HW at or above 1.23 mm have the petiolar scale broadened at the level of the spiracle, with the spiracle itself prominently projecting. When the petiole is viewed from above, the scale, excluding the spiracle, is about twice wider than long. This contrasts sharply with the usual shape, the scale 1.5 or less wider than long. This feature, apparently unique in *Myrmecocystus*, is not consistent; one worker, HW 1.23 mm, has a normal appearing petiole.

Smith (1935) recorded "melliger subsp. or var." from Oklahoma: Wichita Natl. Forest; Comanche Co.; Washita Co. I have been unable to locate any specimens from these localities but suspect they may prove to be *romainei*. They could, however, be *mimicus* and so these records must remain questionable for the present.

Flaviceps Group

Myrmecocystus (Endiodioctes) flaviceps Wheeler

Figures 146–154, 166, 178, 201, 202

Myrmecocystus melliger mimicus var. *depilis*, Wheeler 1908. Bull. Amer. Mus. Nat. Hist. 24:354 *(in part)*; Cook 1953. Ants of California, pp. 342–343 *(in part)*.

Myrmecocystus yuma var. *flaviceps* Wheeler 1912. Psyche 19:177. ♀; Cook 1953. Ants of California, p. 353 *(in part)*.

Myrmecocystus flaviceps, Creighton 1950. Bull. Mus. Comp. Zool. 104:443; Wheeler and Wheeler 1974. Ants of Deep Canyon, p. 119, 121–122.

Myrmecocystus melliger subsp. *mimicus*, Cook 1953. Ants of California, p. 344 *(in part)*.

Diagnosis. Worker: Malar area with twelve or fewer erect hairs; pronotal hairs short, stiff; third tergum with abundant appressed pubescence; gaster uniformly brown, without mediobasal yellowish blotches on first and second terga; CI usually (over 80%) in excess of 90; mandible septemdentate. *Female:* penultimate segment of maxillary palp slender, approximately parallel-sided; punctures of parapsis variably spaced, of two sizes; discs of second and third terga very sparsely punctate and sparsely pubescent; fore femur with few or no erect hairs on inner and dorsal faces, the outer and ventral faces with abundant long hairs; malar area with numerous erect hairs. *Male:* ventral lobe of aedeagus convex in profile; posterior half of mesoscutum wholly or partly polished; first two terga with abundant appressed pubescence; occipital hairs always less than 0.75 × MOD; HW less than 0.8 mm.

WORKER. *Measurements.* HL 0.83–1.23 (0.95); HW 0.73–1.23 (0.87); SL 0.97–1.43 (1.07); WL 1.23–1.80 (1.27); PW 0.53–0.87 (0.57).

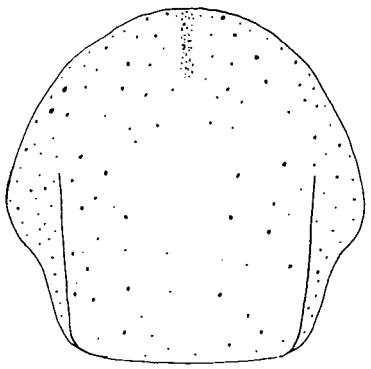
Head: Longer than broad in small workers to slightly broader than long in largest, CI 87–103 (91), over 90 in more than 80% of samples; HL less than SL, SI 108–129 (123); in frontal view broadest at or below lower eye margin, sides straight or barely convex, little or not at all convergent toward mandibular insertion. Occiput, in frontal view, evenly rounded from side to side, without lateral corners. Eye small, 0.75–0.83 (0.75) × first flagellomere; OMD 1.38–1.88 (1.63) × EL. Mandible usually with seven teeth, range: 6–8.

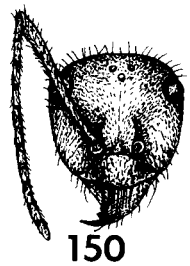
Thorax: Slender to moderately stout, PW 0.41–0.49 (0.45) × WL; mesonotum evenly sloping to metanotum. Propodeum higher than long; in profile, juncture of basal and posterior faces broadly rounded.

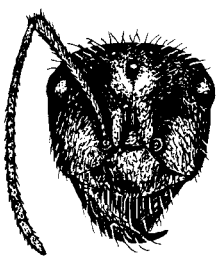
Petiole: In profile, bluntly cuneate, summit broadly rounded; crest, from behind, flat or slightly convex, without median notch.

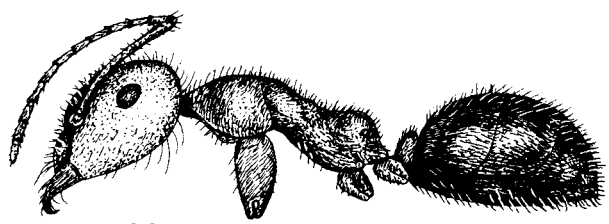
Vestiture: Cephalic pubescence dilute, producing weak sheen on malar area and frons, more pronounced on occiput; pubescence moderately dense on thorax; denser on first three terga.

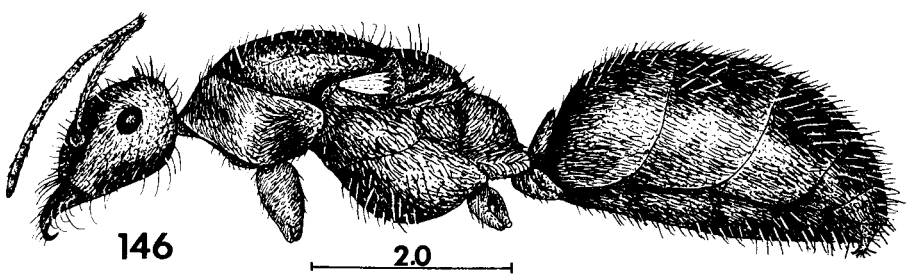
Malar area, in frontal view, with twelve or fewer fine, erect hairs; longest occipital hairs about 0.5 × MOD; pronotal disc with 10–14 short, erect hairs, longest 0.5, or less, × MOD; mesonotum with about 12 short, erect hairs dorsally, longest less than 0.5 × MOD; propodeum with about an equal number on basal face; crest and sides of petiole with a few very short, erect hairs. First three terga with sparse discal hairs which are shorter than apical width of hind tibia, hairs longer on apical margins, succeeding segments and on sterna. Short, erect to subdecumbent hairs numerous on anterior and lateral surfaces of scape, all femora (except inner face of fore femur) and extensor surface of tibiae.











FIGURES 146–154. *M. flaviceps*. 146, female, lateral view; 147, head of female, frontal view; 148, mesoscutum of female, distribution of punctures; 149, major worker, lateral view; 150, head of major worker, frontal view; 151, head of minor worker, frontal view; 152, major worker, vestiture of third tergum; 153, male, lateral view; 154, head of male, frontal view.

Integument: Head lightly shagreened and shiny, with close micropunctures on frons and frontal lobe; coarser and sparser on occiput. Thoracic dorsum moderately shiny, slightly and closely shagreened, sides and propodeum duller. First three terga slightly shiny, closely shagreened and micropunctate.

Color: Normal: Head, thorax and appendages yellowish-ferruginous, head a little darker on frons and occiput; gaster light to medium brownish. Baja California: Frons, occiput, thorax and gaster dark brownish; clypeus, mandible and malar area yellowish; legs medium brownish.

FEMALE. *Measurements.* HL 1.47–1.63; HW 1.57–1.73; SL 1.37–1.53; WL 3.4–3.8; PW 1.9–2.5.

Head: Slightly to distinctly broader than long, CI 102–111, longer than to as long as scape, SI 90–100; malar area, in frontal view, barely convex, not notably convergent toward mandibular insertion. Occiput, in frontal view, gently convex, lateral corners broadly rounded. Eye small, 1.00–1.45 × first flagellomere; OMD 1.46–1.73 × EL. OOD 4.00–4.34 × OD; IOD 2.66–3.33 × OD. Mandible with seven to nine, usually eight, teeth. Penultimate segment of maxillary palp approximately parallel-sided, not notably narrowed at base or apex.

Thorax: Robust, PW 0.53–0.69 × WL. Posterior half of mesoscutum, scutellum and metanotum flattened, in profile, forming a continuous slope to base of propodeum. Propodeum, in profile, usually evenly, gently convex, without defined basal and posterior faces; rarely with basal and posterior faces distinct.

Petiole: Sharply cuneate in profile, summit narrow; in frontal view, crest weakly to strongly angularly incised.

Vestiture: Cephalic pubescence moderately dense on occiput, lighter on frontal lobes and malar area, sparse elsewhere. Thoracic pubescence sparse on mesoscutum and scutellum, dense elsewhere. Gastric pubescence moderately dense basally and on sides of terga, but with broad median areas of first four segments very sparsely pubescent.

Side of head, in frontal view, with six or more long, slender flexuous hairs; occipital hairs erect, slender, longest less than MOD. Mesoscutum with sparse erect hairs, longest less than MOD; scutellum with sparse erect hairs, some of which are about equal to EL; pleura with scattered erect hairs similar to those of scutum. Propodeum with scattered erect hairs on all surfaces, longest less than MOD. Petiole with short erect hairs on sides and crest. Terga with sparse, short erect hairs, those of margins not conspicuously longer than those of discs; hairs of fifth tergum longer than those of first four segments. Scape with scattered short, suberect hairs on all except inner face and abundant shorter subdecumbent hairs. Fore femur with abundant long, erect hairs on ventral and outer faces, none on inner and dorsal faces; mid and hind femora and all tibiae with abundant short subdecumbent to erect hairs. Hind wing with fringe hairs along posterior margin.

Integument: Cephalic surfaces shiny; sides of clypeus irregularly, lightly shagreened and with scattered coarse punctures; malar area with abundant, fine, often elongate, punctures of variable size; frontal lobes with punctures irregularly spaced, often with impunctate areas, punctures of two sizes; frons with extensive impunctate areas on either side of midline, otherwise with sparse, fine punctures; occiput closely, finely micropunctate and with scattered coarser punctures. Scutum shiny, with scattered coarse punctures, sparser in middle; parapsis with punctures irregularly spaced and of two sizes. Median area of scutellum sparsely punctate, marginal areas more finely and closely punctate. Pleura slightly shiny, anepisternum a little more coarsely and less closely punctate than katepisternum. Propodeum dull, closely shagreened. Four basal terga moderately shiny on discs, lightly shagreened and with only sparse setigerous punctures.

Color: Head dark ferruginous with infuscated occipital and frontal areas; thorax dark brownish; gaster dark brown to blackish, with margins of segments yellowish; appendages medium brownish. Wings whitish, veins and stigma yellowish to brownish yellow.

MALE. *Measurements.* HL 0.68–0.80; HW 0.70–0.80; SL 0.77–0.93; PW 0.77–1.10; WL 1.50–1.90.

Head: Longer than broad to slightly broader than long, CI 96–102; distinctly shorter than scape, SI 108–123; in frontal view, malar margins straight, distinctly convergent toward mandibular insertions; occipital margin evenly convex, without defined lateral angles. OMD 0.67–1.00 × EL; OOD 2.50–3.50 × OD; IOD 3.00–3.50 × OD. Mandible without preapical notch, cutting margin edentate.

Thorax: Moderately robust to robust, PW 0.51–0.64 × WL. Propodeum without clearly defined basal face.

Petiole: Thick in profile, bluntly cuneate; crest, in frontal view, narrowly, shallowly, angularly incised.

Vestiture: Pubescence sparse on head and thorax, denser on propodeum; very scattered on first tergum, more conspicuous, but still sparse, on next three segments.

Cephalic pilosity fairly abundant, usually with about six hairs in malar area in frontal view; occipital hairs fine, longest less than half MOD. Mesoscutal hairs sparse, longest less than 0.5 × MOD; scutellar hairs sparse, longest a little less than MOD; pleural hairs sparse, none longer than 0.5 × MOD; propodeum with scattered hairs on side and across base, longest about 0.5 × MOD. Petiole with sparse short hairs on side and crest. Gaster with sparse, long, slender hairs, longest not exceeding MOD. Scape with abundant suberect to erect hairs, much sparser, or absent, from posterior face. Femora with suberect to erect hairs on all surfaces; tibiae with short, sparse, suberect hairs on extensor surface, finer, shorter, subdecumbent hairs

elsewhere. Posterior margin of hind wing with fringe hairs.

Integument: Head moderately shiny, lightly shagreened, nearly smooth on vertex; with scattered fine setigerous punctures. Discs of scutum and scutellum shiny, lightly shagreened, usually with polished median areas of irregular extent, and with scattered setigerous punctures; pleura slightly shiny, closely shagreened and with sparse setigerous punctures. Middle of propodeum smooth and shiny, segment otherwise closely shagreened and slightly shiny. Gastric segments moderately shiny, lightly shagreened, median areas of terga one to three often subpolished.

Color: Medium to dark brownish, gaster sometimes more yellowish (callows?); flagellum, mandibles and legs lighter. Wings whitish, veins and stigma yellowish to brownish yellow.

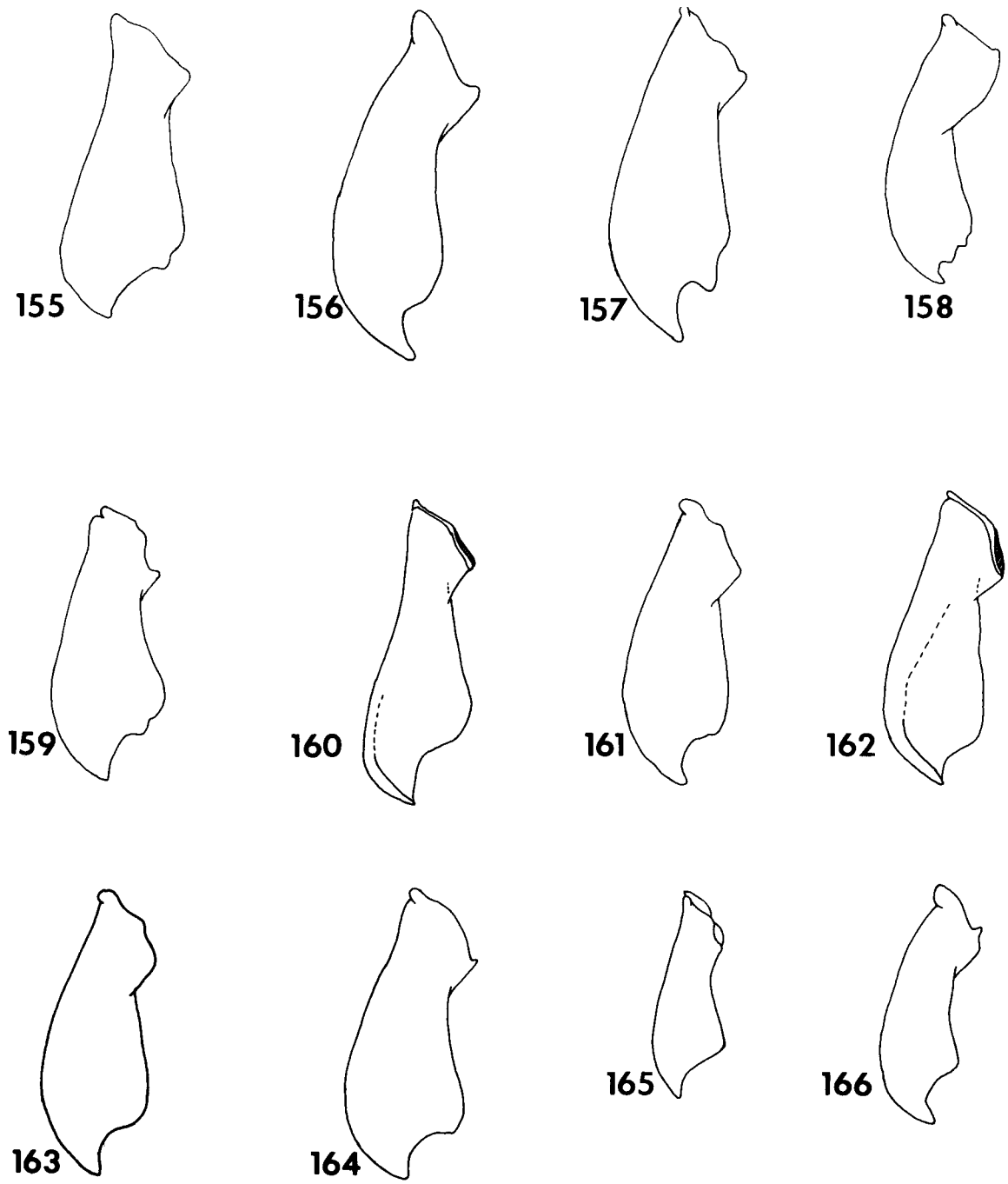
Terminalia: Figures 178, 201, 202.

Type Material. Wheeler 1913: "Described from numerous workers taken from several colonies at Yuma, Arizona . . ." Lectotype, by present designation, agreeing with the above worker description and parenthetical figures: Yuma, Ariz., 26 Nov. 1910, W. M. Wheeler, in AMNH. Lectoparatype workers with same data in AMNH, LACM, MCZ.

Distribution. Southwestern Utah and southern Nevada to northern Sonora and central Lower California (Fig. 366).

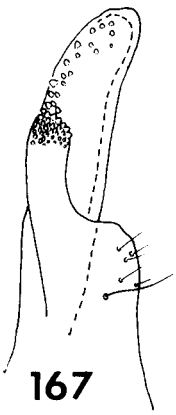
Localities. UNITED STATES. Utah. Millard Co.: 5 & 8 mi N Black Rock, 14 May 1970 (G. F. Knowlton & D. W. Davis; LACM, USU); 30 & 32 mi S Deseret, 14 May 1970 (G. F. Knowlton & D. W. Davis; LACM, USU). *Washington Co.:* Harrisburg, 13 May 1970 (G. F. Knowlton & D. W. Davis; LACM, USU). *Nevada: Esmeralda Co.:* Roosevelt Well, 4400′, 9 mi SW Gold Point, 7 Mar. 1968 (G. C. & J. Wheeler, No. Nev. 274; GCW); 11 mi E Lido, 5000′, 13 Apr. 1970 (G. C. & J. Wheeler, No. Nev. 767; GCW); Dyer, 5100′, 28 May 1970 (G. C. & J. Wheeler, No. Nev. 1027; GCW). *Nye Co.:* 7 mi N Tonopah, 7000′, 30 Oct. 1967 (G. C. & J. Wheeler, No. Nev. 269; GCW); 13 mi SW Beatty, 3800′, 15 Apr. 1970 (G. C. & J. Wheeler, No. Nev. 794; GCW); Beatty, 3400′, 17 Sept. 1952 (W. S. Creighton; LACM). *Clark Co.:* Red Rock Cyn., 3900′, 21 Mar. 1970 (G. C. & J. Wheeler, No. Nev. 652; GCW); 8 mi W Searchlight, 4100′, 13 Mar. 1970 (G. C. Wheeler, No. Nev. 610; GCW); 5 mi W Boulder City, 2000′, 18 Oct. 1952 (W. S. Creighton; LACM). *California: Inyo Co.:* 9-mile Cyn., 3400′, 7 mi S Little Lake, 17 June 1969 (R. R. Snelling, Nos. 69–230, 231; LACM); Grapevine R. Sta., 2100′, Death Valley Natl. Mon., 25 Jan. 1968 (G. C. & J. Wheeler, No. Calif. 300; GCW); Mesquite Spg., 1600′, D.V.N.M., 1 May 1952, (W. S. Creighton; LACM); Midway Well, 100′, D.V.N.M., 4 Mar. 1968 (G. C. & J. Wheeler, No. Calif. 313; GCW); same locality and collectors, 31 Oct. 1967 (No. Calif. 207; GCW); same locality, 12 Nov. 1968 (R. R. Snelling, No. 68–131; LACM); Tule Spg., −250′, D.V.N.M., 5 Mar. 1968 (G. C. & J. Wheeler, No. Calif. 323; GCW); Salt Well, −240′, D.V.N.M., 25 Jan. 1968 (G. C. & J. Wheeler, No. Calif. 299; GCW); Shorty's Well, −100′, D.V.N.M., 4 Nov. 1967 (R. R. Snelling, Nos. 67–278, 279; LACM); same locality and collector, 11 Nov. 1968 (No. 68–129; LACM); Ashford Mill, 0′, D.V.N.M., 28 Apr. 1952 (W. S. Creighton; LACM). *Kern Co.:* China Lake Naval Sta., 13–14 Nov. 1971 (D. E. Fortsch; LACM). *San Bernardino Co.:* Needles, 1–6 Apr. 1918 (J. C. Bradley; CU); 10 mi NE Mitchell Caverns, 4100′, 3 Apr. 1971 (R. J. Hamton; RJH); S end Marble Mts., 900′, 3 mi NE Cadiz, 30 Jan. 1967 (R. R. Snelling; LACM) Cottonwood Spg., 4400′, Granite Mts., 18 mi N Amboy, 6 Nov. 1967 (R. R. Snelling, No. 67–286; LACM); Pisgah Crater, 11 Feb., 11 Mar., 11 Nov. 1961, 17 Nov. 1962 (Norris & Heath; LACM); NW of Barstow, 2100′, May 1971 (W. R. Costa; LACM); Joshua Tree Natl. Mon., 7 mi SE Joshua Tree, 7 Oct. 1967 (R. J. Hamton; LACM, RJH); Lower Covington Flat, Joshua Tree Natl. Mon., 26 June 1966 (R. J. Hamton; RJH); Cajon Cyn., 4000′, 7.7 mi NW Cajon Jct., 13 Mar. 1972 (R. R. Snelling, No. 72–5; LACM). *Riverside Co.:* Coon Hollow, 525′, Mule Mts., 1 Feb. 1967 (R. R. Snelling; LACM); 3 mi NE Old Dale Jct., Joshua Tree Natl. Mon., 6 Apr. 1967 (R. J. Hamton; LACM, RJH); Fan Hill, Joshua Tree Natl. Mon., 26 Jan. 1967 (R. J. Hamton; RJH); Upper Covington Flat, 5325′, Joshua Tree Natl. Mon., 10 July 1966 (R. R. Snelling; LACM); Shaver's Well, 500′, 8 Mar. 1964 (R. R. Snelling; LACM); 3 mi W Shaver's Well, 1 Mar. 1964, 26 Mar. 1966 (R. R. Snelling; LACM); 12 mi ENE Mecca, 12 May 1968 (G. C. & J. Wheeler, No. Calif. 474; GCW); 7 mi E Mecca, 1 Nov. 1970 (R. J. Hamton; RJH); Pushawalla Palms, 6 Dec. 1967 (G. C. & J. Wheeler, No. Calif. 270; GCW); 7.1 mi N Indio, 1100′, 12 Oct. 1968 (R. R. Snelling, No. 68–125; LACM); 1.5 mi N Thousand Palms, 190′, 5 Feb. 1967 (R. R. Snelling; LACM); 3 mi E Thousand Palms, 100′, 16 Feb. 1963 (W. S. Creighton; LACM); same locality, 21 Feb. 1972 (R. R. Snelling, No. 72–1; LACM); Palm Desert, 1 Dec. 967 (G. C. & J. Wheeler, No. Calif. 221; GCW); Deep Cyn., numerous dates and collectors (LACM, GCW, CIS); Palm Springs, various dates (J. C. Bradley; CU, LACM). *Imperial Co.:* 10 mi W Winterhaven, 100′, 24 Oct. 1952 (W. S. Creighton; LACM). *San Diego Co.:* 5 mi N Descanso, 3000′, 12 July 1971 (J. H. Hunt, No. 409; LACM). *Arizona: Mohave Co.:* Yucca, May 1905 (W. M. Wheeler; AMNH). *Pinal Co.:* nr. Casa Grande, Dec. 1964 (W. A. Iselin; LACM); 8 mi N Casa Grande, 1300′, 29 Oct. 1952 (W. S. Creighton; LACM). *Pima Co.:* Abra Wash, 1300′, Organpipe Cactus Natl. Mon., 28 Mar. 1952 (W. S. Creighton; LACM); Quitobaquito, 900′, Organpipe Cactus Natl. Mon., 31 Mar. 1951 (W. S. Creighton; LACM). *Yuma Co.:* 45 mi S Quartzsite, 13 Apr. 1963 (G. I. Stage; LACM); 6 mi E Aztec, 200′, 28 Oct. 1952 (W. S. Creighton; LACM); Dateland, 150′, 27 Oct. 1952 (W. S. Creighton; LACM); Wellton, 150′, 27 Oct. 1952 (W. S. Creighton; LACM); Gila Mts., 700′, 21 Oct. 1952 (W. S. Creighton; LACM); Vintner, 150′, 26 Oct. 1952 (W. S. Creighton; LACM); Blaisdell, 200′, 26 Oct. 1952 (W. S. Creighton; LACM, Yuma, 26 Nov. 1910 (W. M. Wheeler, cotypes of *M. yuma flaviceps;* AMNH, LACM, MCZ). *MEXICO. Sonora:* 2 mi N Sonoyta, 31 Oct. 1952 (W. S. Creighton; LACM), 22 mi S Sonoyta, 800′, 1 Nov. 1952 (W. S. Creighton; LACM). *Baja Calif.:* 11 mi E Tecate, 3 May 1964 (R. R. Snelling; LACM); Bahía San Luis Gonzaga, 0′, 19 Feb. 1969 (R. R. Snelling, No. 69–4; LACM); Calamajué, 1100′, 19 Feb. 1969 (R. R. Snelling, No. 69–6; LACM); 5 mi W Calamajué, 850′, 20 Feb. 1969 (R. R. Snelling, No. 69–10; LACM); 35.3 mi S El Marmolito, 800′, 22, 23 Feb. 1969 (R. R. Snelling, Nos. 69–16, 17, 18); Calmalli, 1200′, 23 Feb. 1969 (R. R. Snelling, No. 69–19); 3 mi NW Camalu, 29 Mar. 1970 (E. M. Fisher; LACM); 2 mi S Rancho Mezquital, 10 Oct. 1972 (E. M. Fisher; LACM). *Baja Calif. Sur:* 8 mi SW El Arco, 23 Feb. 1969 (R. R. Snelling, No. 69–25; LACM); 26.9 mi S El Arco, 475′, 24 Feb. 1969 (R. R. Snelling, No. 69–30, 31; LACM); 3 mi W Las Parras, 1700′, 1 Mar. 1969 (R. R. Snelling, No. 69–57; LACM).

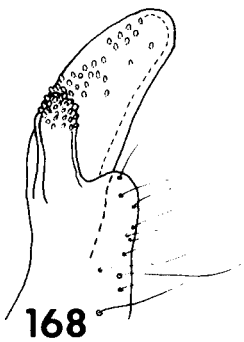
Ecology. Wheeler (1912) noted that craters of this ant were about 6–8 in. in diameter with entrances

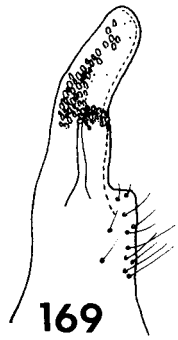


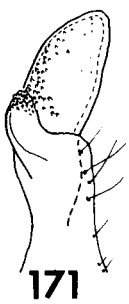
FIGURES 155–166. Male mandibles. 155, *M. mendax;* 156, *M. placodops;* 157, *M. semirufus;* 158, *M. depilis;* 159, *M. mimicus;* 160, *M. kathjuli;* 161, *M. kennedyi;* 162, *M. nequazcatl;* 163, *M. wheeleri;* 164, *M. koso;* 165, *M. romainei;* 166, *M. flaviceps.*

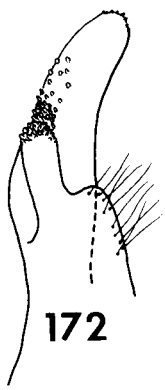
nearly 0.5 in. across. The nest crater figured by Wheeler (1908:367, Fig. 14) as that of *mimicus* from Needles, California, probably belongs to this species. Wheeler and Wheeler (1974), studying this ant at Deep Canyon, California, figured two nest craters. They reported 38 samples from the Desert Biome: Larrea-Palo Verde, 12; Cholla-Palo Verde, 25; Agave-Ocotillo, 1. The nests which they observed were larger than those noted by Wheeler, the craters 10–16 in. in diameter (but the one in figure 44 does not seem nearly so large) with

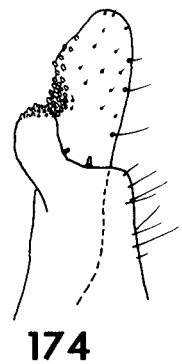


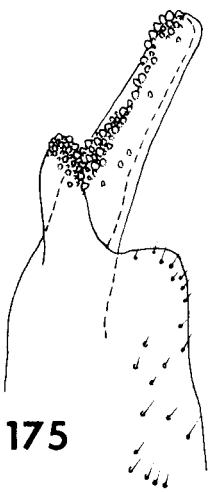


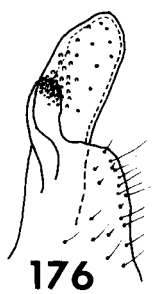


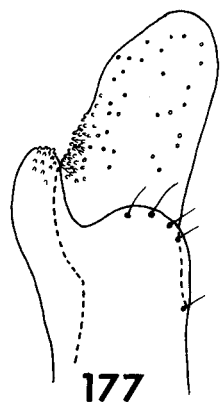




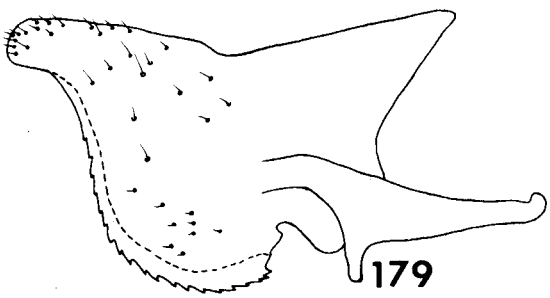


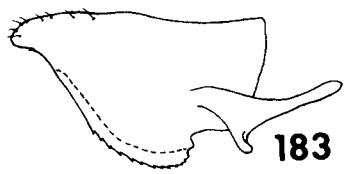


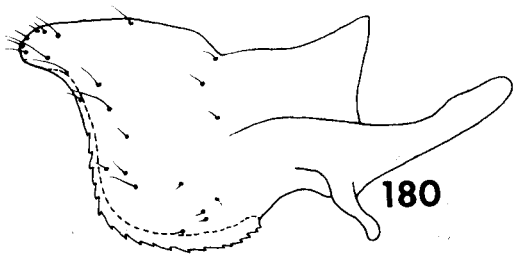


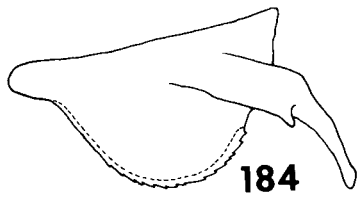


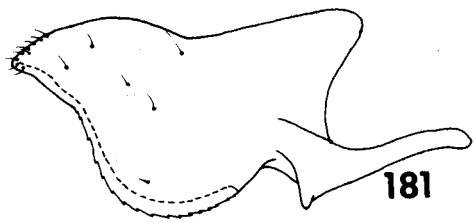
FIGURES 167–178. Male volsellae (inner view). 167, *M. mendax;* 168, *M. placodops;* 169, *M. semirufus;* 170, *M. depilis;* 171, *M. mimicus;* 172, *M. kathjuli;* 173, *M. kennedyi;* 174, *M. nequazcatl;* 175, *M. wheeleri;* 176, *M. koso;* 177, M. *romainei;* 178, *M. flaviceps.*

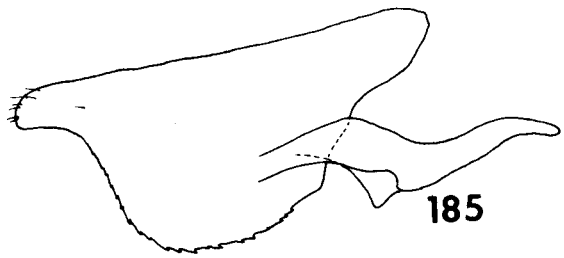


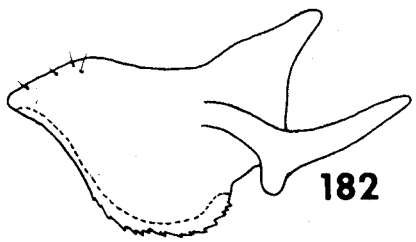


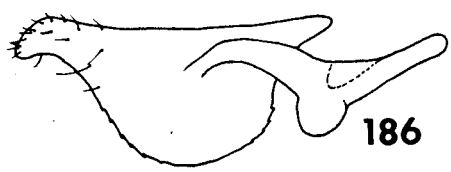




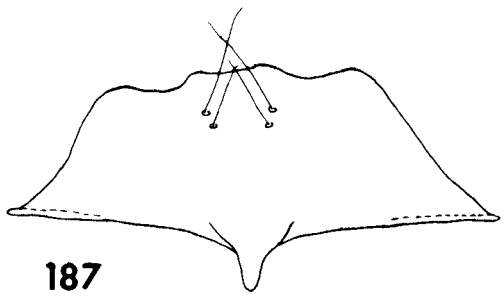


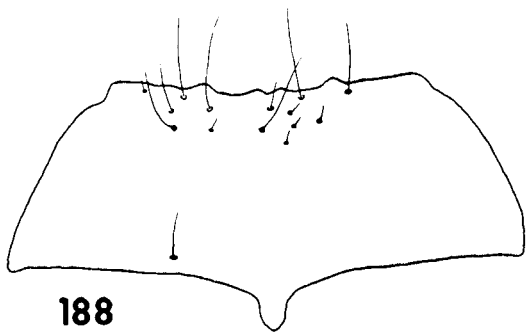


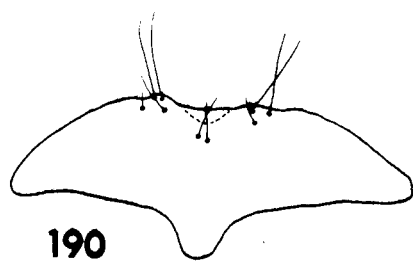


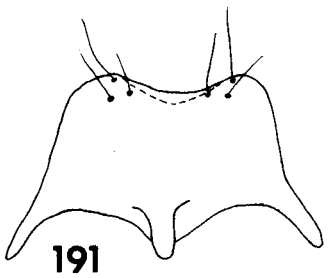


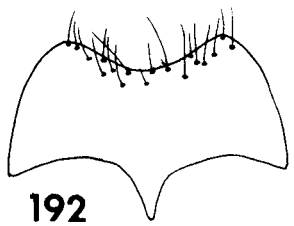
FIGURES 179–186. Male aedeagi, lateral view. 179, *M. mendax;* 180, *M. placodops;* 181, *M. semirufus;* 182, *M. depilis;* 183, *M. mimicus;* 184, *M. kennedyi;* 185, *M. kathjuli;* 186, *M. nequazcatl.*

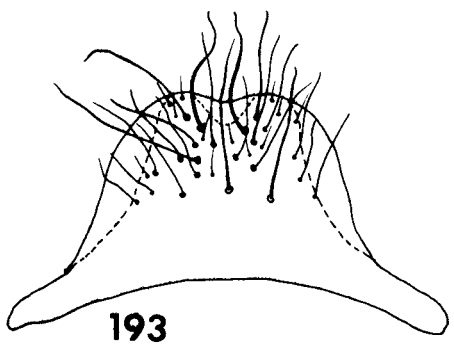


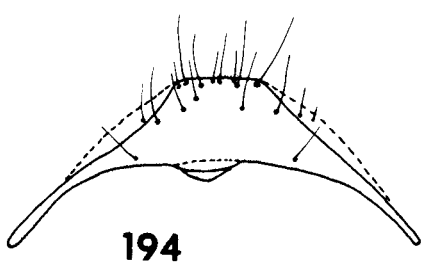




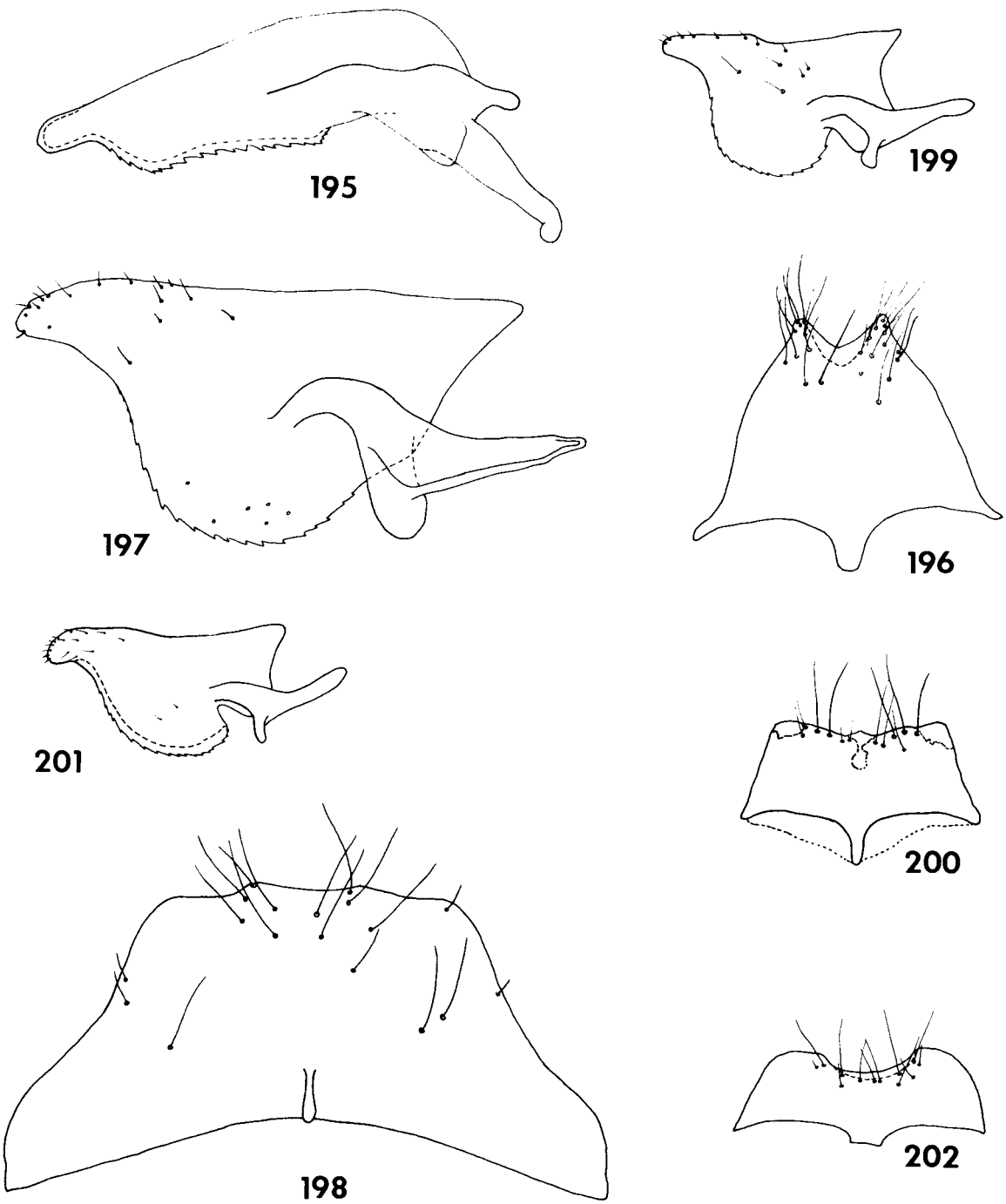








FIGURES 187–194. Male seventh sterna. 187, *M. mendax;* 188; *M. placodops;* 189, *M. semirufus;* 190, *M. depilis;* 191, *M. mimicus;* 192, *M. kennedyi;* 193, *M. kathjuli;* 194, *M. nequazcatl.*



FIGURES 195–202. Male aedeagi and seventh sterna, respectively. 195, 196, *M. wheeleri;* 197, 198. *M. romainei;* 199, 200, *M. koso;* 201, 202, *M. flaviceps.*

entrances 1.5–3.0 in. across. Alate females were found in the nests on 1 December.

Participation in a biocenose on *Opuntia echinocarpa* was observed by Wheeler and Wheeler. Other insects noted to be present were: ". . . mealybugs, aphids, other ants *(Solenopsis xyloni),* and braconids [*Lysiphlebus testaceus* (Cresson)] . . ." They further noted workers of this ant at extrafloral nectaries of *Euphorbia micromera.*

Habitats for this species include Juniper Steppe Woodland, Great Basin Sagebrush, Saltbush-Greasewood, Creosote bush, Creosote bush-Bur sage, and Palo

Verde-Cactus shrub communities. The ant is a diurnal forager, primarily as a scavenger-predator. Considerable quantities of nectar are taken from floral and extrafloral nectaries as well as indirectly through solicitation of mealybugs and aphids. Repletes were found in colonies near Shorty's Well, Death Valley.

Seasonal occurrence of reproductives is noted in Table 5. Creighton found the species flying after a light rain on 16 Feb. 1963 near Thousand Palms, California.

Discussion. Wheeler originally described this as a variety of *yuma,* but noted that it would perhaps ultimately rank as an independent species. The abundance of differences, which here place the two in different subgenera, more than justifies that assumption.

When Creighton (1950) elevated *flaviceps* to full species he apparently did so because it and *yuma* were known to be sympatric. There is no evidence that he knew either from other than their type series and in the case of *flaviceps* the types are in very poor condition. Creighton separated the two on the basis of head shape and color.

The type series consists wholly of minor and media workers, some of them callow, and is exceptionally poorly mounted. I have been able to examine about two dozen of these specimens and between them have accumulated the characters permitting the present interpretation. As now understood, this is a western form allied to *romainei* which replaces that species in low desert areas. It is a variable species, and possibly the present interpretation is too conservative.

There is some variation in the size of this species, other than the normal polymorphic variation. Workers from Calmalli and 26.9 mi S of El Arco, in Lower California, are the largest examples seen. The head length of the larger workers from these series is in excess of 1.4 mm. In these large individuals, the sides of the head are strongly convex, the head approaching the orbiculate condition of *placodops* and *intonsus*. Large workers from a sample collected 35 mi S of El Marmolito, Baja California, have the head length somewhat less (about 1.3 mm), but still retain the semiorbiculate shape.

By contrast, specimens from more northern stations tend to be distinctly smaller. Samples from California yield the following maximum head length: 1.25 mm (Midway Well, Death Valley; Shaver's Well, Riverside Co.), 1.18 mm (Granite Mts., San Bernardino Co.), 1.15 mm (Coon Hollow, Riverside Co.) and 1.05 mm (Marble Mts., San Bernardino Co.). In these more northern samples the sides of the head, even in the largest workers, are straight or but slightly convex. Rarely are individuals with suborbiculate heads encountered.

The pattern of erect hairs is subject to great variation. The samples from central Lower California generally have six, or fewer, hairs on the malar area in frontal view. The scape hairs are numerous and at right angles to the long axis of that segment. The fore femur has numerous short erect hairs on the anterior face. The seta count for the hind tibia is in excess of 30. The cotypes from Yuma, Arizona, are similar but the hairs of the scape are finer, and are mostly reclinate; the fore femur is without erect hairs on the anterior face. The hind tibia have far fewer erect hairs, the seta count ranging from 15–20. Specimens from the Granite Mts. have 10 or more erect hairs on the malar area, the fore femur with numerous hairs on the anterior face and a seta count of 30 or more for the hind tibia. The few specimens from Sonoyta, Sonora, have the scape setae exceptionally fine; many of these are subappressed and it is difficult to achieve a meaningful seta count. In this sample the fore femur lacks erect hairs on the anterior face and the setae of the hind tibia are from 12–18.

Although the third tergum typically is uniformly covered with fine appressed pubescence, producing the characteristic gastric sheen, this is by no means con-

TABLE 5

Activity of Reproductives of *M. flaviceps* Wheeler

Locality	Date	Activity
ARIZ., Dateland	27 Oct. 1952	♂♂ in nest
ARIZ., near Casa Grande	Dec. 1964	♂♂, ♀♀ in nest
CALIF., Fan Hill	26 Jan. 1967	♂♂, ♀♀ in nest
CALIF., 3 mi NE Cadiz	30 Jan. 1967	♂♂, ♀♀ in nest
CALIF., 1.5 mi N Thousand Palms	5 Feb. 1967	♂♂, ♀♀ in nest
CALIF., 3 mi E Thousand Palms	16 Feb. 1963	mating flight after rain
CALIF., Shaver's Well	8 Mar. 1964	♂♂, ♀♀ in nest
CALIF., 3 mi W Shaver's Well	26 Mar. 1966	♂♂, ♀♀ in nest
CALIF., 7.1 mi N Indio	12 Oct. 1968	♀♀ in nest
CALIF., Shorty's Well	4 Nov. 1967	♂♂, ♀♀ in nest
CALIF., Shorty's Well	11 Nov. 1969	♂♂, ♀♀ in nest
CALIF., Deep Canyon	1 Dec.	♀♀ in nest
CALIF., Palm Springs	17 Dec. 1917	♀♀ in nest
B. CALIF., Bahia San Luis Gonzaga	19 Feb. 1969	♂♂, ♀♀ in nest
B. CALIF., 11 mi E. Tecate	3 May 1964	♂♂ in nest

stant. A few of the smallest workers from El Arco and Calmalli have the pubescence greatly reduced and it is absent (save a few widely scattered hairs) in the majority of the sample from El Marmolito.

The color of this species is quite variable. Southernmost samples from Lower California have the head and thorax brownish-red, the propodeum, legs and petiole darker; the infuscation sometimes extends over the entire thoracic dorsum and the top of the head. Specimens from Bahia San Luis Gonzaga, Baja California, are very extensively infuscated. The head, thorax and legs are light reddish in specimens from Shaver's Well, with the propodeum and petiole slightly darker. Samples from Death Valley have the head, thorax and legs light reddish, brighter than those from Shaver's Well, with only the petiole a little darker.

Workers of *flaviceps* from the Mojave Desert are very similar to those of *romainei* from Utah and central Arizona. The characteristic punctation of the vertex of *romainei* become weaker and sparser than in the more eastern populations of that species. They may be confused with *flaviceps*. In general, *flaviceps* workers from the Mojave Desert have twelve or fewer erect hairs on the malar area. There is, however, sufficient variation to make this character uncertain.

The erect pronotal hairs of *flaviceps* seem consistently less than 0.5 × MOD. In *romainei* there is less constancy, but those populations in which the hairs are 0.5, or less × MOD are eastern. The specimens from Utah and central Arizona have longer hairs, 0.57–0.62 × MOD.

EREMNOCYSTUS New Subgenus

Diagnosis: Worker and female with septemdentate mandibles; eyes little, if any, longer than first flagellomere; wings of sexuals with numerous fine, erect white hairs on membrane; small concolorous blackish or dark brownish species.

Description: Worker: Mandible with seven teeth; ocelli distinct; eye small, maximum length hardly exceeding that of first flagellomere; clypeus about twice wider than long; fewer than six hairs on malar area in frontal view; pubescence reduced, not obscuring tergal surfaces (exception: *colei,* n. sp.) and very sparse on head; monochromatic blackish to brownish, lower third of head often yellowish. *Female:* Similar to worker, except for usual caste characters; wings with abundant fine, erect whitish hairs on membrane; wing fringe absent (exception: *creightoni* Snelling). *Male:* Wing membrane with abundant fine, erect, whitish hairs; aedeagus without setae; mandible usually without defined denticles basad of apical tooth.

Type Species: Myrmecocystus creightoni Snelling 1971.

Entymology: Eremnos (Gr., swarthy, dark) + *Kystis* (Gr., bladder), reflecting the uniformly dark color of these honey ants, their most important field recognition characteristic.

Included Species: M. colei, n. sp.; *M. creightoni* Snelling 1971; *M. hammettensis* Cole 1938; *M. lugubris* Wheeler 1909; *M. perimeces,* n. sp.; *M. tenuinodis,* n. sp.; *M. yuma* Wheeler 1912.

This subgenus includes all the small, uniformly dark species. Their small size (largest workers 6 mm or less in length) and distinctive coloration render them easily recognizable in the field. They superficially resemble the dolichoderine species, *Conomyrma insana* (Buckley).

Eremnocystus is the least widely distributed subgenus of *Myrmecocystus*. One species is found in southwestern Idaho and I have samples of what may prove to be another species from Washoe County, Nevada. The bulk of the species occur in southern California. Two species are found in the Mojave Desert, two are found in the Colorado Desert, one occurs in the valleys between the Transverse Ranges and one is known from the coastal sand dunes around Bahia San Quintin in Baja California.

The treatment afforded the group here is not wholly satisfactory. The small size, obscure habits and disjunct ranges of the component species have resulted in their rarity in collections, even though the species may be quite common where they occur. Most of the species are wholly allopatric with one another. The only area of known sympatry is that of Yuma, Arizona, where *tenuinodis* and *yuma* are found, often nesting within a few meters of one another. Adjacent, but apparently wholly allopatric species are *lugubris, creightoni* and *colei*. Both *hammettensis* and *perimeces* appear to be well outside the known ranges of other species.

The current distribution pattern suggests the possibility that these populations could be treated, for the most part, as subspecies. However, the lack of material of an intermediate nature and the constancy of characters within a population do not support such an interpretation. Too, characters used here to differentiate the species are of the same magnitude as those used elsewhere in this revision.

It appears that the subgenus may once have had a wider, and more continuous, distribution and probably consisted of a single species, such as *creightoni*. With increasing aridity in the southwestern United States populations may have become isolated and evolved along restricted lines which became increasingly exaggerated in the absence of disruptive gene flow from other populations. No doubt, too, some selective pressure has been exerted by the larger, and more aggressive, diurnal foragers of the subgenus *Endiodioctes*. The largest and hairiest member of *Eremnocystus* is *colei*. This species is found in the Los Angeles Basin and the Cajon Canyon area of San Bernardino County. In this area the only competing diurnal forager is *wheeleri* in the subgenus *Endiodioctes*. In southwestern Idaho *hammettensis* shares diurnal foraging with *kennedyi,* another species of *Endiodioctes*. Slightly