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**DESCRIPTIONS OF SEXUAL CASTES OF SOME ANTS
IN THE GENERA MYRMICA, MANICA AND
XIPHOMYRMEX FROM THE WESTERN UNITED
STATES. (HYMENOPTERA: FORMICIDAE).¹**

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Myrmica striolagaster Cole

Male (Cole Coll. No. AZ-372).

Head length, 0.92 mm.; head width, 0.85 mm.; scape length, 0.63 mm.; thoracic length, 1.70 mm.; petiolar length, 0.46 mm.; petiolar node width, 0.31 mm.; postpetiolar length, 0.39 mm.; postpetiolar node width, 0.44 mm.; overall length, 5.15 mm.

Head considerably narrowed in front, occipital corners and border broadly rounded. Eyes large, prominent, very convex. Ocelli prominent, milky white with black centers. Frontal carinae extending back nearly to level of posterior corners of eyes; frontal lobes reduced; frontal area large, impressed, broad, subtriangular. Median lobe of clypeus moderately and evenly convex, its anterior margin straight and unimpressed, its apex broadly concave. Antennal scapes, in repose, extending nearly to posterior margin of head, broadly curved at base, as long as the five following segments taken together. Mandibles large, triangular; with a prominent, sharp, apical tooth, a moderately long, sharp, subapical tooth, and four, distinct, short, blunt, basal teeth.

Thorax with strong, deeply and rather broadly impressed Mayrian furrows and distinct parapsidal furrows. Base of epinotum very broadly convex and meeting epinotal declivity at a rather pronounced, rounded angle; epinotal armature absent. Petiolar node, in profile, rather sharply and evenly convex, its anterior declivity slightly concave at a point about half-way to the peduncle, its anterior portion a little higher than the posterior one; postpetiole, in profile, higher behind than in front, less convex than petiolar node; venter of petiole with a short, broad, acute, antero-ventrally directed spine; venter of postpetiole very broadly convex, unarmed. Petiole, viewed from above, narrower in front than behind, longer than broad, obovate, broadest through the center, about equal in length to but narrower than the postpetiole which is only slightly longer than broad, a little narrower in front than behind, and subglobular in outline. Gaster elliptical, not truncate at base.

Head prominently reticulo-rugose and finely and densely granulate on nearly all surfaces. Non-reticulate, longitudinal rugae occur on median clypeal lobe and on the frontal triangle and above it where they converge toward the median ocellus. Mandibles with a few longitudinal rugulae, the surface very finely granulate. Antennal scapes finely and very densely granulate; funiculi finely and less densely granulate. Sides of thorax longitudinally rugose, with a tendency toward weak reticulations. Scutum longitudinally rugulose, the rugulae of the anterior portion converging mesally; scutellum and base of epinotum longitudinally rugose, with a few rugae extending part-way down on epinotal declivity. Entire thorax, except lower part of epinotal declivity densely and finely granulate, the lower part of epinotal declivity smooth and shining. Petiolar node, viewed from above,

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faintly granulose, with a few longitudinal striae mesad, bordered by longitudinal rugae; viewed in profile, densely and finely granulose and longitudinally rugulose. Postpetiole finely coriaceous and somewhat shining dorsally, less shining laterally and ventrally. Legs densely and finely coriaceous, rather shining. Gaster lightly shagreened and moderately shining.

Hairs yellow, numerous, scattered, long, slender, pointed, erect and suberect; absent from venter of petiole, frontal triangle, and declivous face of epinotum; longest on postpetiole, dorsum of petiole, and anterior border of median lobe of clypeus. Pubescence absent except on club of funiculus where it is long, dense, and silvery.

Body a very dark reddish brown, with petiole and postpetiole a little lighter; mandibles, antennal scapes, and tarsi a dusky yellow.
Female (alate). Cole Coll. No. AR-456).

Head length, 1.26 mm.; head width, 1.14 mm.; Scape, length, 0.99 mm.; thoracic length, 1.90 mm.; petiolar node length, 0.37 mm.; petiolar node width, 0.36 mm.; postpetiolar node length, 0.39 mm.; postpetiolar node width, 0.60 mm.; overall length, 5.86 mm.

Very much like the worker except for the larger size, lighter-colored head, thorax, and appendages and the strongly infuscated cephalic dorsum, scutum, scutellum, paraptera, meso- and metathoracic epimera, and mesothoracic sternites and episternites.

Readily distinguishable from the females of other *Myrmica* by the large, saucer-like antennal lamellae, the thin and strongly elevated frontal lobes, the very rough integument, and the punctatostriolate dorsum of the first gastric segment.

This species, which was first described in 1953, from a series of workers collected in 1952 at Bandelier National Monument, New Mexico, is now known to have a rather extensive range in the western United States. The male described above was taken from a colony near Prescott, Arizona and the female from a nest near Portal, Chiricahua Mts., Arizona.

This species is now known from the following localities, at elevations of 5,000-6,000 feet.

New Mexico—Bandelier Natl. Monument. (*Type locality*).

Arizona—Cochise Stronghold, Dragoon Mts.; Prescott Natl. Forest, 6 mi. S. of Prescott; Oak Creek Canyon, 18 mi. S. of Flagstaff; Chiricahua Mts.

Texas—Limpia Canyon, Davis Mts.

Xiphomyrmex spinosus near *insons* Wheeler

Male.² (Cole Coll. No. TX-86).

Head length, 0.70 mm.; head width, 0.65 mm.; scape length, 0.36 mm.; thoracic length, 1.53 mm.; petiolar length, 0.46 mm.; postpetiolar length, 0.29 mm.; width of petiolar node, 0.34 mm.; width of postpetiolar node, 0.46 mm.; overall length, 4.32 mm.

Head a little longer than broad, broadest just behind eyes, much narrowed in front, sides weakly convex, posterior corners very broadly rounded, posterior border short and straight. Antennae 10-segmented; scape as long as following two segments combined, nearly straight but with a faint, broad curvature. Median lobe of clypeus a little longer than wide, subrectangular, moderately and evenly convex, the anterior border straight and unimpressed; lateral clypeal lobes much reduced. Frontal lobes narrow, slightly deflected downward, the border broadly rounded. Eyes large, very convex. Ocelli prominent. Mandibles broad, convex, triangular; with a long, acute apical tooth, a shorter, broad, sharp, subapical tooth, and a series of four basal teeth of irregular position and length.

² For a description of *insons* see Wheeler, *Bull. Amer. Mus. Nat. Hist.* XXXIV (1915) 416-417. The workers of *insons* appear not to differ significantly from those associated with the male described below.

Thorax with distinct, broad, but rather shallow Mayrian furrows. Basal surface of epinotum twice as long as the very steep declivous surface, the two meeting at an unrounded angle. Epinotal armature absent. Petiole, in profile, subtriangular, with the node descending gradually to its prominent anterior peduncle, the declivity being only slightly convex; posterior declivity of node a little less steep and shorter than anterior one, the surface being slightly concave. Postpetiole, in profile, with a broadly convex anterior surface, a much rounded apex, and a very short, gently-sloping posterior surface. Petiole and postpetiole unarmed ventrally. Viewed from above, the petiole is fusiform, its node broadly transverse, with prominent, protuberant, slightly rounded, lateral margins; narrowing strongly to its long anterior peduncle, and less strongly to the shorter, broad, posterior peduncle; petiole together with its peduncles, shaped like a lamp chimney. Viewed from above, postpetiole broader than long, transversely elliptical. Wings with radial, discoidal, and cubital cells; veins light brown; membrane suffused with very pale brown. Gaster elliptical, not truncate basally.

Head subopaque, finely punctate and mostly reticulo-rugose; irregular, widely spaced, longitudinal, non-reticulate rugae extend from anterior border of median lobe of clypeus to median ocellus, those on clypeal lobe being limited to mesal region. Mandibles smooth and shining. Thorax largely subopaque and finely punctate, except scutum which is somewhat shining; scutum and scutellum longitudinally rugulose and finely punctate, except for mesothoracic sternites and anterior portion of scutum which are largely free of sculpture and rather strongly shining. Epinotal base and declivity densely and finely punctate and irregularly rugulose, the surface opaque. Petiole finely and densely punctate, and reticulo-rugulose; nearly opaque. Postpetiole finely and sparsely punctate the surface shining. Legs smooth and shining. Gaster smooth and highly shining.

Hairs numerous, scattered, long, slender, pointed, golden; erect and suberect on body and legs, suberect and short on antennal scapes and funiculi. Eyes with a number of short hairs. Pubescence moderately abundant, yellow, short, and not fully appressed on funiculi; absent elsewhere.

Head, thorax, and petiole a dark reddish brown; postpetiole, legs, and first gastric segment lighter; pronotal collar and antennae a dusky yellow; mandibles (except teeth), lateral lobes of clypeus, and distal portion of gaster a light tan; mandibular teeth a deep rich tan.

Described from one of a series of nine males collected with associated workers from a nest at Ozona, Texas, on August 22, 1956. Variation among the males is not sufficient for comment.

Manica bradleyi (Wheeler)

Male. (Cole Coll. No. Nev-59).

Head length, 1.12 mm.; head width, 1.11 mm.; scape length, 0.36 mm.; thoracic length, 2.60 mm.; petiolar length, 0.87 mm.; petiolar width, 0.41 mm.; postpetiolar length, 0.63 mm.; postpetiolar width, 0.60 mm.; overall length, 9.37 mm.

Head with length and width subequal, broader behind than in front, the sides subparallel, posterior corners and occipital margin broadly convex; median lobe of clypeus broader than long, anterior border straight and entire; frontal triangle large, well impressed basally, faint apically; eyes large, very convex; ocelli prominent; antennal scape short, only slightly and broadly curved, its length approximately that of second funicular segment.

Thorax a little wider than the head through the eyes; epinotum unarmed, its base and declivity forming an even, broad convexity, the base considerably longer than the declivity; petiole, in profile, much thicker posteriorly than anteriorly, the anterior declivity of the node long and gradual and meeting the very short and somewhat steeper posterior declivity

in a much rounded angle; petiole, viewed from above, slightly broader through the node, the sides subparallel; postpetiole, from above, obovate, notably broader than the petiole.

Head subopaque, rugulose, and rather densely punctulate; rugulae with a longitudinal trend on frontal region and vertex, transverse on median lobe of clypeus and between lateral ocelli; mandibles longitudinally striate. Thorax largely subopaque and longitudinally rugulose with the interstices smooth and shining; rugulae especially dense and prominent on posterior portion of scutum; basal face of epinotum transversely rugulose, declivious face smooth and shining. Legs and antennae finely coriaceous. Petiole, postpetiole, and gaster smooth and strongly shining.

Hairs numerous, long, slender, sharp, scattered, yellow, erect, suberect, and reclinate; absent from declivious surface of epinotum; very sparse on

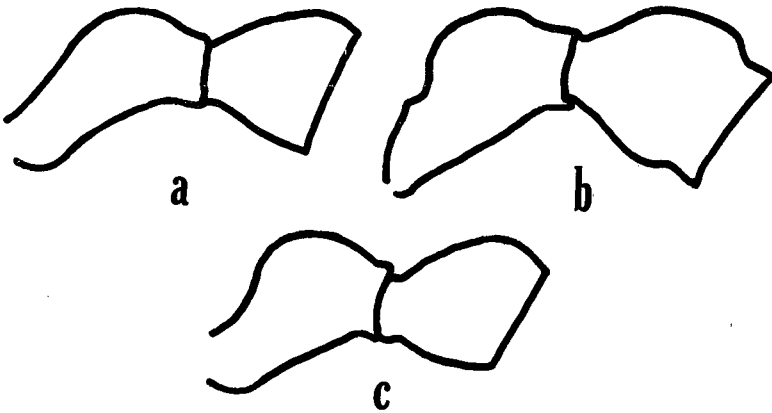


Fig. 1. Petiolar and postpetiolar contours in profile. a, *M. bradleyi* (Wheeler); b, *M. hunteri* (Wheeler); and c, *M. mutica* (Emery.) Male caste.

venter of petiole; very short, numerous, and blunt on eyes. Antennal funiculi with dense, subappressed and suberect, yellow pubescence.

Entire body jet black, except for apex of mandibles and the mandibular teeth which are a dark to light brown.

All nine of my males were reared from pupae collected from three nests during the period of August 5 to 8, 1956, near Spooners Summit (7,300 ft.) near Lake Tahoe, Nevada. Variation among them is negligible. Body color is constant.

The male of *bradleyi* can readily be distinguished from that of *mutica* (Emery) by the former's uniform black body. In spite of a considerable amount of color variation in males of *mutica*, there is always apparently a bicolored condition. The males may be separated further by the smooth and shining petiole and postpetiole of *bradleyi* which contrasts sharply with the consistently sculptured and shining to subopaque petiole and the frequently similar postpetiole of *mutica*.

Female, alate. (Cole Coll. No. Cal-219).

Head length, 1.72 mm.; head width, 1.90 mm.; scape length, 1.36 mm.; thoracic length, 3.32 mm.; petiolar length, 0.90 mm.; petiolar node length,

0.65 mm.; petiolar node width, 0.61 mm.; postpetiolar length, 0.71 mm.; postpetiolar node width, 0.90 mm.; overall length, 10.90 mm.

Very much like the worker except for its larger size, different color, and the broadly and rather deeply sinuate anterior border of the median clypeal lobe. Head, except mandibles and antennae, black; antennal scapes dark brown, funiculi lighter; mandibles rather light brown, infuscated, the teeth dark reddish brown. Thorax, except epinotum, black; epinotum, petiole (except venter), and postpetiole a clear orange, ventral keel and posterior peduncle of petiole darker. Legs dark brown except for trochanters, proximal portion of femora, and the tibiae which are reddish brown.

The specimen described was collected with associated workers from a crater nest near the Tioga Road, Yosemite National Park, Calif., at an elevation of 8,000 feet, on July 30, 1956. The other (two) females were reared from pupae taken from nests of *bradleyi* near Spooners Summit (7,300 ft.), near Lake Tahoe, Nevada, during the period of August 5 to 8, 1956. The chief variation among these females is in color. One specimen differs from the female described in being a rather concolorous black, the other one in having the petiole and postpetiole brown and the epinotum black like the rest of the body. One of the specimens bears a pair of tuberculate epinotal spines, and one has a pair of well-developed, lateral, postpetiolar spines, the latter apparently representing an anomaly. The female of *bradleyi* can easily be distinguished from that of *mutica* (Emery) by color differences.

In an unsuccessful effort to find the parasitic species, *Manica parasitica* Creighton, associated the nests of *bradleyi*, I examined more than 300 nests in California and Nevada. From my field experience, I must conclude that *bradleyi* with considerably more frequency constructs its nest marked by a soil crater or series of craters than it does beneath a stone. At least this behavior was obvious at the stations where I made my observations and where all manageable stones were removed.

Manica hunteri (Wheeler)

Male.

Head length, 1.19 mm.; head width behind eyes, 1.29 mm.; scape length, 0.44 mm.; thoracic length, 2.92 mm.; petiolar length, 1.16 mm.; petiolar width at node, 0.53 mm.; postpetiolar length, 0.73 mm.; postpetiolar width at node, 0.67 mm.; gastric length, 2.67 mm.; overall body length, 8.67 mm.

Head irregularly rugulose, the interspaces finely punctate; median lobe of clypeus unevenly longitudinally rugulose. Thoracic scutum mostly smooth and highly shining; scutellum finely striolapunctate; base of epinotum punctate and longitudinally rugulose; declivity of epinotum finely punctate; sides of thorax finely punctate to striolapunctate. Base of epinotum much shorter than declivity, the two meeting in a slightly rounded very obtuse angle. Petiole and postpetiole in profile as in Fig. 1b, the nodes smooth and shining. Body a concolorous black; legs and mandibles brown.

The males which I studied were collected from Warren Park (6,700 ft.) at Sundance, Wyoming, on July 8, 1952, by M. Classick and they were made available to me through the courtesy of Dr. M. R. Smith, of the U. S. National Museum.

The male of *hunteri* resembles that of *bradleyi* (Wheeler) in color, in the lack of sculpture on the petiolar and postpetiolar nodes, and in the greater length of the base than of the declivity of the epinotum. It is similar to that of *mutica* (Emery) in cephalic sculpture and in the size and shape of the petiolar and postpetiolar nodes when viewed from above. The petiolar node of *bradleyi*, when viewed dorsally, is much more slender than the postpetiolar node and hence differs considerably from that of both *hunteri* and *mutica*.

The following key will serve to separate the known males of *Manica*:

1. Concolorous black; node of petiole smooth and shining -----2
 Bicolored (black head and thorax; orange petiole, post-
 petiole, and gaster); petiole weakly to moderately
 transversely striate. (Petiolar and postpetiolar contours
 in profile as in Fig. 1c) ----- *mutica* (Emery)
2. Median lobe of clypeus densely transversely rugose; base
 of epinotum notably longer than declivity; petiolar and
 postpetiolar contours in profile as in Fig. 1a-- *bradleyi* (Wheeler)
 Median lobe of clypeus irregularly longitudinally rugose;
 base of epinotum notably shorter than declivity; petio-
 lar and postpetiolar contours in profile as in Fig. 1b
 ----- *hunteri* (Wheeler)

LITERATURE

- Cole, A. C. 1953. Studies of New Mexico ants. (Hymenoptera: Formicidae).
 I. A new species of *Myrmica*. *Jour. Tenn. Acad. Sci.*, 28:81-82.
 -----1956. New synonymy in the genus *Manica* Jurine (Hymenop-
 tera: Formicidae). *Jour. Tenn. Acad. Sci.*, 31:260-262.