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A DECADE OF NORTH AMERICAN FORMICIDÆ.*

BY WILLIAM MORTON WHEELER,

BOSTON, MASS.

1. *Myrmica bradleyi*, new species.

Worker. — Length 4–7 mm.

Allied to *M. rubida* Latreille and *M. mutica* Emery. Head rectangular, as broad as long, with subparallel sides and straight posterior border. Mandibles moderately convex, pointed, with minutely denticulate blades. Clypeus somewhat

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convex in the middle, with nearly straight anterior border. Frontal area distinct. Antennal scapes simple, curved and feebly compressed at the base; funicular joints all longer than broad; club 5-jointed. Thorax rather slender, with pronounced mesoepinotal constriction; pro- and mesonotum evenly rounded in profile; epinotum unarmed, base slightly convex, passing through a distinct, but obtuse angle into the somewhat shorter, straight and sloping declivity. Petiole slender, fully three times as long as broad, in profile with a well-developed, cylindrical peduncle, armed with a small, acute, antero-ventral tooth, and surmounted by a low rounded node just behind the middle. Anterior slope of node concave, posterior more convex. Postpetiole fully $1\frac{1}{2}$ times as long as broad, subcampanulate; in profile with its upper surface rising in a gentle curve towards the posterior edge of the segment and then abruptly descending. Gaster elliptical, rather large.

Shining; head and thorax subopaque, petiole, postpetiole, gaster and legs glabrous. Mandibles densely striato-punctate. Clypeus, frontal area and head finely, longitudinally rugose, the rugæ somewhat curved and diverging on the front but straight on the posterior portion of the head. Cheeks and posterior corners also coarsely punctate. Thorax finely rugose like the head, the rugæ being transverse on the pronotum and base of epinotum, longitudinal on the pleuræ and mesonotum. On the epinotal declivity they are faint or obsolete, and the surface is densely and finely punctate.

Hairs golden yellow, long, abundant and pointed, suberect or reclinate, covering the body and appendages throughout.

Mandibles, thorax, petiole and postpetiole brownish-yellow; head, mandibular denticles, gaster, legs and antennal scapes black; trochanters, bases of femora, knees, tips of tibiae, tarsi and antennal funiculi, except their clubs, yellowish-brown. In some specimens the mandibles are more or less infuscated, with paler masticatory borders; in certain individuals, also, the coxæ are more or less yellowish like the thorax. Venter and sting brown or yellowish.

Described from fifteen specimens taken by Mr. J. Chester Bradley in Alta Meadow, Tulare County, California, at an altitude of 9,500 feet.

This beautiful species may be readily distinguished from the allied *M. rubida* of Europe and *mutica* of the western states by its color and its glabrous and much more slender petiole and postpetiole. In both the species mentioned the postpetiole is nearly as broad as long. The epinotum of *bradleyi* is more angular than in *mutica*, and therefore more like the epinotum of *rubida*. This form also resembles *bradleyi* in having the upper surface of the postpetiole smooth and shining. There is in my collection a pale yellow variety of *mutica* from Moscow, Idaho (J. M. Aldrich), with smooth and shining petiole and postpetiole, but these segments are much more robust than those of *bradleyi*.

2. Pogonomyrmex (Epebomyrmex) pima, new species.

Worker. — Length 3.5–4 mm.

Head rectangular, a little longer than broad, with straight, subparallel sides and feebly excised posterior border. Eyes somewhat flattened, just in front of the middle of the head. Clypeus short, slightly convex in the middle, with straight, entire anterior border and without a tooth in front of each antennal fovea. Frontal area distinct. Antennal scapes reaching nearly half way between the eyes and posterior corners of the head; funicular joints 3–7 as broad as long, remaining joints distinctly longer than broad. Thorax short, robust, broader in front than behind, with rounded humeri; dorsum in profile broadly rounded. Epinotal spines approximated, erect, compressed, rather blunt, a little longer than broad at their bases, further apart than long, connected by a prominent transverse ridge, separating the base from the declivity of the epinotum. A prominent ridge also runs down the side of the declivity from each spine and forward on each side of the base. Metasterna projecting upward as acute, compressed teeth, shorter and broader than the epinotal spines. Petiole with a narrow, laterally compressed peduncle, which is as long as the node; the former with a blunt anteroventral tooth, the node in profile conical, with straight, subequal anterior and posterior slopes and rather angular summit; seen from above the posterior slope is subelliptical, $1\frac{1}{2}$ times as long as broad. Postpetiole campanulate, as long as broad, in profile evenly rounded above, with its anteroventral surface convex and protruding. Gaster elliptical, rather small, formed very largely by the first segment. Legs stout, with incrassated femora.

Mandibles opaque, striated throughout. Head, thorax, petiole and postpetiole opaque. Head, including clypeus and frontal area, covered with coarse, longitudinal rugæ, which diverge somewhat behind towards the posterior corners of the head and converge on the clypeus towards the middle of its anterior border. Interrugal spaces densely and finely punctate. Thorax coarsely reticulate-rugose, the rugæ being vermiculate and sublongitudinal on the pleuræ and mesonotal region. Neck finely and transversely rugulose. Epinotal declivity with a single pair of coarse ridges or rugæ between the pair descending from the bases of the spines. Petiolar node and postpetiole coarsely shagreened, with a few shallow and scattered punctures. Legs and gaster somewhat shining, the latter more finely shagreened than the petiole and postpetiole, with rather coarse, scattered, piligerous punctures. Antennal scapes opaque.

Hairs blackish, short, erect and stubby on the body, scarcely more oblique on the legs and antennal scapes and not elongated to form ammochætæ on the gula.

Rich ferruginous red, posterior portions of thorax somewhat darker; antennæ and legs yellow; mandibular teeth black.

Described from a dozen specimens taken by myself at Tucson, Arizona, and a single specimen taken at Phoenix in the same state.

This species is closely related to *P. (E.) nageli* Forel from Brazil and *P. (E.) imberbicus* Wheeler from Texas, but differs from both in lacking the teeth on the clypeus in front of the antennal foveæ, and in the sculpture of the head, petiole and postpetiole. In both the species mentioned the head is coarsely reticulate-rugose and in *nageli*

this is true also of the petiole and postpetiole, in *imberbicus* of the petiole. From the latter species *pima* differs also in its much less shining gaster and somewhat smaller size.

3. **Pogonomyrmex (Epebomyrmex) townsendi, new species.**

Worker. — Length 4 mm.

Head rectangular, scarcely longer than broad, with straight subparallel sides and feebly excised posterior border. Eyes moderately convex, just in front of the middle of the head. Clypeus short, convex in the middle, with straight, entire anterior border, and a large, blunt, erect tooth in front of each antennal fovea. Frontal area distinct, carinulate in the middle. Antennal scapes reaching a little more than half way between the eyes and the posterior corners of the head; funicular joints 3-7 as broad as long, remaining joints longer than broad. Thorax short, robust, broader in front than behind, with rounded humeri; dorsum in profile broadly rounded, somewhat depressed in the middle. Epinotal spines erect, approximated, and rather blunt, somewhat further apart than long, longer than broad at their bases, which are connected by a strong, transverse ridge and continued forward as a pair of ridges bounding the base of the epinotum and backward as another pair bounding the declivity. Metasternal teeth acute, laterally compressed, shorter than the epinotal spines. Petiole with a slender, laterally compressed peduncle, which has a blunt, antero-ventral tooth and is distinctly shorter than the node. In profile this has a shorter, straight and abrupt anterior, and a longer, more sloping, convex posterior declivity; seen from above the latter is subelliptical, about $1\frac{1}{2}$ times as long as broad. Postpetiole campanulate, as broad as long, in profile evenly rounded above, with a strong antero-ventral protuberance. Gaster small, elliptical. Legs rather stout, with incrassated femora.

Subopaque; mandibles striated throughout; clypeus longitudinally rugose, the rugæ converging towards the middle of the anterior border. Head covered with coarse longitudinal rugæ, which are straight and parallel and do not diverge towards the posterior corners. These rugæ are connected with one another by transverse rugæ and the spaces between them are filled with minute, dense, shallow punctures. Thorax somewhat more coarsely reticulate-rugose than the head, the rugæ distinctly longitudinal on the dorsum and pleuræ. Neck and base of epinotum between the ridges punctate-rugulose; declivity with a few coarse and irregular rugæ. Petiolar node coarsely reticulate-rugose; postpetiole and basal half of first gastric segment densely and finely punctate, the former with indistinct longitudinal rugæ, the latter with sparse, piligerous foveolæ. Remainder of gaster and the legs more shining. Antennal scapes opaque, punctate and longitudinally rugulose.

Hairs rather short, abundant, pointed, yellowish in some lights, black in others, erect on the body, slightly oblique on the appendages, not elongated to form ammochætæ on the gula.

Rich ferruginous red, thorax somewhat darker behind; legs and antennæ yellowish; mandibular teeth black.

Described from a single specimen taken by Mr. C. H. Tyler Townsend at Ojo del Cerro Chilicote, Chihuahua, Mexico.

This species differs from *P. (E.) nageli* in the sculpture of the base

of the epinotum, postpetiole and base of the gaster. The Brazilian species has the epinotum coarsely rugose, the postpetiole reticulate-rugose and the base of the gaster longitudinally striated. From *P. (E.) imberbiculus*, *townsendi* differs in the sculpture of the postpetiole and gaster and the greater opacity of the whole body; from *pima* in having prominent teeth on the clypeus, in the reticulate rugosity of the petiolar node, the sculpture of the head, etc.

4. *Leptothorax melanderi*, new species.

Worker. — Length 2 mm.

Head rectangular, a little longer than broad, with straight, subparallel sides, straight posterior border and eyes in the middle of the sides. Mandibles apparently 6-toothed. Clypeus moderately convex, with broadly rounded, entire anterior border, not produced in the middle. Antennæ 12-jointed; scapes reaching to the posterior corners of the head; first funicular joint as long as joints 2-5 together; joints 2-8 small, subequal, decidedly broader than long; club 3-jointed, its two basal joints subequal, together shorter than the terminal joint. Thorax rather robust, with rounded humeri and without mesoepinotal suture or depression; in profile the dorsum is uniformly and feebly rounded. Epinotal spines stout, acute, longer than broad at their bases and nearly as long as their distance apart, directed backward and slightly outward and upward. Petiole about $1\frac{1}{2}$ times as long as broad, broader behind than in front, in profile conical, with rather acute apex, its anterior declivity concave and longer than the posterior declivity which is more abrupt and slightly convex; antero-ventral tooth of peduncle prominent and acute. Postpetiole from above subrectangular, about $1\frac{1}{3}$ times as broad as the petiole, and $1\frac{1}{2}$ times as broad as long, slightly broader in front than behind, with distinct anterior angles; in profile convex in front above, depressed behind. Gaster elliptical, rather convex, with rounded anterior corners. Legs of the usual shape.

Opaque; gaster glabrous and streak down the middle of the head and clypeus slightly shining. Mandibles coarsely striato-punctate. Clypeus and head finely, longitudinally rugose, the latter under a higher magnification also minutely reticulate. Thorax, petiole and postpetiole uniformly and densely punctate.

Hairs white; sparse, erect and clavate on the body; slender pointed and appressed on the mandibles and appendages; longer and more oblique on the femora than on the tibiæ.

Dark brown; gaster black; mandibles, clypeus, cheeks, gula, appendages, neck and articulations of pedicel brownish; femora infuscated in the middle. Mandibular teeth black.

Described from a single specimen taken by Mr. A. L. Melander on Moscow Mountain, Idaho.

This species is closely related to *L. nevadensis* Wheeler, but differs in being more opaque, of a darker color, in having joints 2-8 of the funiculus shorter, the clypeal margin entire, the thorax less narrowed behind and the nodes of the petiole and postpetiole of a different configuration.

5. *Leptothorax furunculus*, new species.

Worker. — Length 2–2.6 mm.

Head longer than broad, subrectangular, with very feebly emarginate posterior border and slightly convex sides, with the eyes slightly in front of their middle. Mandibles 6-toothed. Clypeus convex, with rounded, entire, rather projecting anterior border, its disc with a longer median and a pair of shorter lateral carinæ. Antennæ 12-jointed; scapes not reaching the posterior corners of the head; first funicular joint as long as joints 2–5 together; joints 2–7 narrow, subequal, broader than long, joint 8 as long as broad; club 3-jointed, its two basal joints subequal, together shorter than the terminal joint. Thorax somewhat narrower behind than in front, with rounded humeri; dorsum flattened, with a distinct mesoëpinotal suture and impression. Epinotal spines about as long as broad at their bases, rather acute, further apart than long, directed upward and slightly outward and backward. Petiole nearly twice as long as broad, slightly broader behind than in front, with straight sides; in profile with rather thick peduncle, armed with an acute antero-ventral tooth; node high and acute, its anterior declivity concave, the posterior shorter, more abrupt and feebly convex. Postpetiole subrectangular, a little broader than the petiole and somewhat broader than long, with subparallel sides and distinct anterior angles; in profile with low, rounded node. Gaster rather large, elliptical, with rounded anterior corners. Legs of usual shape.

Mandibles opaque, indistinctly striato-punctate. Clypeus and frontal area shining, sides of the former longitudinally rugulose. Head, thorax, petiole and postpetiole subopaque or glossy; gaster glabrous, legs somewhat less shining. Head very finely longitudinally rugulose and reticulate. Thorax, petiole and postpetiole covered with dense, shallow punctures, thoracic dorsum also very indistinctly and longitudinally rugulose.

Hairs yellow; on the body sparse, erect, obtuse but hardly clavate; on the legs and scapes replaced by delicate appressed pubescence.

Yellow; thorax, petiole and postpetiole pale brown; head, excluding the mandibles, clypeus, cheeks and gula, dark brown; gaster dark brown or blackish above, with the posterior edge and a broad band across the anterior portion of each segment, yellow. Antennal clubs slightly infuscated. Mandibular teeth black.

Described from a number of specimens which I took from a single colony under a stone in Williams Cañon, near Manitou, Colorado, at an altitude of about 7,500 feet.

This species differs from all our other North American species of *Leptothorax* with 12-jointed antennæ (except those of the subgenus *Dichothorax*) in having a distinct mesoëpinotal impression. It resembles *L. tricarinatus* Emery in the structure of its clypeus, but its petiole and postpetiole are very different, and the color of the body is much paler. The surface of the head, thorax and pedicel have a peculiar oily appearance which I have not observed in any of our other species of the genus.

6. *Lasius (Acanthomyops) occidentalis*, new species.

Worker. — Length 2.5–3 mm.

Head rectangular, a little longer than broad, with straight posterior border and very feebly convex, subparallel sides. Mandibles with 7 or 8 unequal teeth. Eyes small. Clypeus feebly carinate. Antennal scapes not extending beyond the posterior corners of the head. Funiculus gradually enlarging towards the tip, joints 2 and 8–10 as long as broad, joints 3–7 somewhat broader than long. Thorax of the usual shape in the subgenus. Petiole as high as the epinotum, about half as broad as high, compressed anteroposteriorly, with slightly convex anterior and flat posterior surface; seen from behind rectangular, with the sharp transverse upper border emarginate in the middle. Legs rather long, feebly compressed.

Surface of body shining, finely and rather sparsely punctate, head and clypeus more glabrous. Mandibles striatopunctate.

Pilosity and pubescence golden yellow; the former long, erect, obtuse, moderately abundant, confined to the body; the latter more abundant, covering the body and appendages, but little longer and denser on the gaster than elsewhere.

Yellow; head slightly reddish; borders of clypeus and mandibles dark red; teeth of latter black.

Female. — Length 4.5–5.5 mm.

Head more rectangular than in the worker, distinctly longer than broad, with very straight, parallel sides and feebly excised posterior border. Eyes flattened, just behind the middle of the head. Antennal scapes reaching half way between the eyes and the posterior corners of the head, incrassated at their distal ends; all the joints of the funiculus, except the first and last, somewhat broader than long. Thorax a little more than twice as long as broad, elliptical from above, through the wing insertions but little broader than the head; mesonotum and scutellum flat; epinotum with a short base rounding into the rather steep declivity. Petiole like that of the worker. Gaster longer than the thorax, narrow, with subparallel sides. Legs rather long, somewhat compressed laterally, but not dilated. Tarsi slender, hind metatarsus much shorter than the hind tibia. Wings long (5.5 mm.), discal cell rarely incomplete or absent.

Pilosity, pubescence and sculpture like those of the worker, but the pubescence is longer and on the gaster much denser and more conspicuous, so that the segments appear subopaque.

Color resembling that of the worker, but somewhat more brownish throughout. Wings yellowish hyaline, slightly infuscated towards their bases, with brown veins and stigma.

Male. — Length 2.6–3 mm.

Head, excluding the mandibles, somewhat broader than long, slightly broader behind than in front, with straight posterior border. Eyes hairless, convex, in the middle of the sides of the head. Mandibles edentate. Clypeus broadly rounded in front, convex and subcarinate in the middle. Frontal furrow distinct. Antennæ slender; scapes reaching somewhat beyond the posterior corners of the head; funiculi with cylindrical, subequal joints; first joint feebly swollen, longer than the second. Thorax rather robust, through the wing insertions broader than the head. Declivity of epinotum more sloping than in the female. Petiole like that of the worker but more compressed anteroposteriorly. Gaster elliptical, somewhat flattened dorsoventrally. Discal cell of wings often lacking.

Less shining than the worker, finely and indistinctly punctate.

Pilosity and pubescence grayish, much shorter and sparser than in the worker and female.

Piceous; head and in some specimens also the mandibles and clypeus black, gaster paler; funiculi, tarsi, articulations of legs, genitalia and mouth-parts sordid yellowish. Wings grayish hyaline, scarcely infuscated towards their bases; veins and stigma brown.

Described from numerous specimens of all three phases taken by myself early in July, 1903, from several colonies under stones in various localities about Colorado Springs, Colorado (Pospect Lake, Roswell, Broadmoor and Ute Pass). There is also in my collection a dealated female taken at Pecos, New Mexico, by Professor T. D. A. Cockerell "on a stone at edge of Pecos River, July 30."

This species is most closely related to *L. (A.) interjectus* Mayr, but is much smaller in all its phases. The worker and female are readily distinguished from those of Mayr's species by the much more rectangular and elongate head, shorter antennal scapes, less glabrous body and more abundant pile and pubescence. The male differs from that of *interjectus* in having edentate mandibles, a much less swollen first funicular joint, more finely punctate body, lighter color, less infuscated wings and especially in its smaller size (the male of *interjectus* measures nearly 4 mm.).

7. *Formica adamsi*, new species.

Worker. — Length 3.5–5 mm.

Allied to *F. rufa* L. Head, excluding the mandibles, nearly as broad as long even in the smallest individuals, with straight posterior border, rounded posterior corners and slightly but distinctly convex sides. Eyes large. Mandibles 7–8 toothed. Clypeus prominently carinate, with broadly rounded anterior border, not produced in the middle. Palpi of moderate length. Antennæ slender; scapes nearly straight at the base; funicular joints all distinctly longer than broad, the basal somewhat more slender and longer than the apical joints. Pro- and mesonotum moderately rounded, convex, the latter elliptical and nearly twice as long as broad, the former a little broader than long. Epinotum with subequal base and declivity; the former slightly convex, the latter flattened or even slightly concave; the two surfaces in profile passing into each other through a rounded angle. Petiole more than half as broad as the epinotum, in profile with convex anterior and flattened posterior surface and sharp upper border; seen from behind the border is rounded and feebly or not at all produced upward in the middle. Gaster and legs of the usual configuration.

Opaque throughout, only the mandibles, frontal area and sides of the clypeus faintly shining or glossy. Mandibles finely and densely striated. Surface of body densely and indistinctly shagreened.

Hairs and pubescence pale yellow; the latter covering the whole body and appendages, inconspicuous, except on the gaster, but even on this region not sufficiently

dense to conceal the surface sculpture. Hairs short, sparse and obtuse, in several rows on the gastric segments; on the thorax confined to the median portions of the pro- and mesonotum, on the head to the clypeus, front and vertex. The hairs on the mandibles are appressed and pointed, on the palpi short, but numerous and conspicuous. Legs naked, except for a series of pointed bristles on the flexor surfaces of the tibiæ and tarsi and a few blunt hairs on the anterior surfaces of the fore coxæ.

Sordid brownish-red; the smaller specimens somewhat more yellowish-red. Gaster dark brown, except a large spot at the base of the first segment and the anal region, which are reddish-yellow. A large spot on the pronotum, one on the mesonotum, much of the posterior surface of the head, the distal halves of the antennal funiculi, and in many specimens also the coxæ and femora, dark brown or blackish. These dark markings are present in the largest as well as in the smallest workers. Teeth of mandibles black.

Described from numerous specimens taken from a single colony on Isle Royale, Michigan, and received from Dr. C. C. Adams. A dozen workers taken by myself on Pikes Peak, Colorado, near timber line, at an altitude of 10,500 to 11,000 feet, differ from the Isle Royale specimens only in having the frontal area smooth and shining, the middle of the petiolar border produced upward as a distinct, blunt point, and in the less extensive infuscation of the head, pro- and mesonotum. These specimens may be regarded as representing a distinct variety, which may be called *alpina* var. nov. Both this and the typical *adamsi* may be distinguished from our other North American *Formicæ* of the *rufa* group by their small size, opaque surface and peculiar coloration and pilosity. The following collector's note accompanying the Isle Royale specimens adds some ethological characters which are not observed in any of the other small forms of the *rufa* group known to me: "The nests of this ant are one of the most conspicuous features of the drier tamarack swamps. They are rounded-conical in shape, 3-6 dcm. high or even larger and with a diameter at the base about equalling the height. They are composed within of *Sphagnum*, but as would be expected with such material, without any definite system of galleries. The outer surface is thickly covered with leaves of *Cassandra*, probably to prevent loss of moisture by evaporation from the interior. They are frequently placed under or near a bush of *Cassandra*, but the same covering is used even if no *Cassandra* is near." (H. A. Gleason.)

8. *Formica comata*, new species.

Worker. — Length 4.5-7 mm.

Allied to *F. ciliata* Mayr. Head, excluding the mandibles, as broad as long, broader behind than in front, with rounded posterior corners, feebly excavated posterior margin and slightly convex sides. Eyes large. Mandibles 7-toothed. Cly-

peus carinate, with broadly rounded, entire anterior border, not projecting in the middle. Frontal area subsemicircular, broader than long. Antennal scapes straight at the base, slightly enlarging distally; funicular joints 1-4 somewhat more slender than the remaining joints. Thorax as usual in the *rufa* group of *Formica*, epinotum angular in profile, with subequal base and declivity, the former horizontal and slightly convex, the latter sloping and slightly concave. Petiole as high as the epinotum, in profile attenuated above, with rather sharp border; seen from behind broadly rounded or sometimes produced upward in the middle in the form of a blunt point; anterior surface convex, posterior surface flat. Gaster rather large, legs of the usual configuration.

Subopaque, slightly glossy; corners of head somewhat shining; whole body finely and densely shagreened; frontal area, bases of mandibles and corners of clypeus glabrous; mandibles finely and densely striated.

Hairs yellow, short and suberect, sparse on the head, thorax and petiole, more abundant and obtuse on the gaster, absent on the antennal scapes, present in a single row on the flexor surfaces of the femora and tibiæ, scattered on the fore coxæ, long on the venter and tip of gaster. Pubescence long, grayish, sparse on the head, thorax and petiole, dense on the gaster, where it completely conceals the surface; somewhat conspicuous on the legs. Eyes hairless.

Red; gaster blackish-brown except a large spot at the base and the anal region, which are reddish or yellowish. Mandibles, corners of clypeus, antennæ and legs reddish-brown; bases of scapes often paler; pro- and mesonotum each with a fuscous spot, pale in the largest, somewhat larger and darker in the smallest workers; apical half of petiolar node more or less infuscated. Small workers also with brown or black spots on the clypeus, front, occiput and epinotum and with the coxæ more or less infuscated. Mandibular teeth black.

Female. — Length 7.5-8 mm.

Resembling the female *ciliata* in form. Whole body much more shining than that of the worker as the shagreening of its surface is much more delicate; scutellum and metanotum glabrous. Pubescence like that of the worker, but longer; pilosity grayish, resembling that of the female *ciliata* but less dense, and the very long hairs on the gaster are slender, less appressed, rather straight and not recurved at their tips. Color of the body dull brownish-yellow, gaster blackish-brown, except its base and anal region. Mandibles, funiculi, corners of clypeus, anterior borders of cheeks, posterior border of pronotum, a large anteromedian and two parapsidal blotches on the mesonotum, dull brown; scutellum and metanotum chestnut-brown. Wings long (9 mm.), uniformly smoky hyaline, with brown veins and darker stigma.

Male. — Length 8-8.5 mm.

Head decidedly broader than long, narrowed in the region of the cheeks, which are short and flat; posterior border of head straight, posterior corners broadly rounded. Eyes large, suboblong. Maxillary palpi 5-jointed. Mandibles 4-toothed. Clypeus convex, subcarinate, with entire, slightly reflected anterior border. Thorax and gaster of the usual shape, the former distinctly broader than the head. Petiole broad and low, with thick, rounded, transverse upper border.

Body subopaque; pleuræ, scutellum, metanotum and gaster more shining. Mandibles striatopunctate. Head and thorax very finely and densely punctate, gaster shagreened, with rather coarse, scattered, piligerous punctures on its upper surface.

Hairs and pubescence grayish, more abundant than in the worker; the hairs very

long on the epinotum, border of petiole, basal gastric segment and venter, somewhat shorter on the clypeus and pronotum and still shorter on the upper surface of the gaster. Eyes hairless.

Black; borders of mandibles, tibiæ, tarsi and articulations of legs brownish, or in some specimens yellowish. Genitalia sordid yellow. Wings like those of the female.

Described from a dozen workers, five females and six males taken from a single colony at Manitou, Colorado (July 26, 1906). I have taken this species (four females and several workers) also in Red Rock Cañon, near Colorado Springs in the same state (July 28, 1903). *F. comata* may represent a hybrid between *F. ciliata* and *F. rufa obscuripes* Forel or *F. rufa rubiginosa* Emery. The female, though it combines certain characters of all these forms, is very distinct on account of its peculiar coloration and pilosity. It is much more difficult to distinguish the workers. The legs are paler, the body more hairy and the abdomen darker than in the *ciliata* worker, and the larger workers of the latter species lack the dark spots on the thorax. In the worker *obscuripes* and *rubiginosa* the hairs on the head and thorax are much more abundant and more erect than in *ciliata* and *comata* and the infuscation of *obscuripes* workers of all sizes is much more pronounced and extensive. The male of *comata* differs from that of *ciliata* and *obscuripes* in having dentate mandibles and somewhat paler wings. The nest of *comata* is not a mound like that of *obscuripes*, but is excavated, like that of *ciliata*, under stones and these are rather heavily banked or even covered with vegetable detritus.

9. *Formica crinita*, new species.

Worker. — Length 4–6.5 mm.

Resembling the worker of the preceding species but averaging somewhat smaller. Head, excluding the mandibles, a little longer than broad, even in the largest workers; narrower in front than behind, with nearly straight posterior and lateral margins. Eyes rather large. Mandibles 7–8 toothed. Clypeus carinate, with entire anterior border, slightly projecting in the middle. Frontal furrow distinct. Antennæ, thorax and petiole as in *comata*. Palpi rather short. Gaster and legs of the usual shape.

Body subopaque, very finely shagreened; bases of mandibles, frontal area and corners of clypeus glabrous. Mandibles and clypeus finely, longitudinally striated.

Hairs yellow; absent on the head, thorax, petiole and appendages, blunt and scattered on the gaster, pointed on the clypeus, mandibles and venter. Pubescence yellowish and very short, inconspicuous on the head, thorax and petiole, somewhat longer on the legs and gaster; on the latter rather dense and nearly concealing the surface. Eyes hairless.

Yellowish-red; gaster dark reddish-brown, except the anal region and a spot at the base of the first segment, which are yellowish; tips of antennal funiculi, middle

portions of femora and tibiae brownish or reddish. The smallest workers have the upper surface of the thorax, especially the pro- and mesonotum, somewhat infuscated. Mandibular teeth black.

Female. — Length 6.5–7 mm.

Resembling the female of *ciliata*. Body shining throughout, very finely shagreened, without pubescence. Hairs very long, yellow, curled or hooked at their tips, confined to the clypeus, gaster and ventral surface of the petiole; on the gaster appressed and arranged in two rows near the posterior border of each segment. Body and appendages yellow; teeth of mandibles and anterior edge of clypeus black; scutellum, metanotum, an antero-median and two parapsidal blotches on the mesonotum, anterior borders of cheeks and a narrow band parallel with the posterior edge of each gastric segment, brown. Antennal funiculi infuscated towards their tips. Wings grayish hyaline, with pale brown veins and darker brown stigma.

Described from six mature and five callow females and eighteen workers taken by myself from a single nest near Boulder, Colorado (July 29, 1906). This species is, perhaps, a hybrid between *F. oreas* Wheeler and *F. ciliata* Mayr, but the worker differs from those of both these species in the absence of hairs on the head, thorax and petiole, and the female has much fewer hairs and these are confined to the clypeus and abdomen. The hairs are very easily rubbed off in both workers and females, but the long series of the former and the callows of the latter show that they cannot be more abundant than described above. The colony from which the specimens were taken was very populous. Its nest resembled very closely those of *ciliata*, *comata* and *oreas* which I have examined in Colorado. It was under several contiguous stones, banked with vegetable detritus and in the immediate neighborhood of flourishing colonies of *F. ciliata* and *rufa obscuripes*.

10. **Camponotus schaefferi, new species.**

Worker major. — Length 9–10 mm.

Head convex above, flat below, as broad as long, narrower in front than behind, with broadly and feebly excised posterior border and very convex sides. Cheeks with a transverse impression. Mandibles rather small, very convex, 5–6-toothed. Clypeus subrectangular, ecarinate, flat, longer than broad, a little broader in front than behind, its anterior border with a small blunt tooth on each side and distinctly excised in the middle. Antennal scapes reaching to the posterior corners of the head, not compressed. Eyes rather large, flat, elliptical. Frontal area indistinct. Vertex with a small pit in the position occupied by the anterior ocellus in the female, and two smaller pits on each side further back. Thorax narrowed behind and laterally compressed, its dorsum in profile rather evenly arcuate, with a distinct metanotal sclerite. Epinotum subrectangular in profile, with subequal base and declivity separated by a rounded angle, the base being straight, the declivity slightly concave. Petiole narrower than the epinotum, with well-developed node, which is erect, very

convex in front, flat behind and has a sharp border; seen from behind the border is rounded or slightly and bluntly acuminate in the middle. Gaster as usual. Legs rather long, femora somewhat enlarged.

Shining throughout and very finely and indistinctly shagreened; whole upper surface of head with scattered punctures, which may be slightly elongated on the occiput. Mandibles coarsely and densely punctate, scapes with coarse but scattered punctures. Mesonotum with a few piligerous foveolæ.

Hairs golden yellow, moderately long, suberect, sparse on all parts of the body, as long on the gula as on the upper surface of the head; present also on the fore coxæ, flexor surfaces of the fore femora and knees. Tibiæ with a row of short, stiff hairs on their flexor surfaces. Scapes with a few scattered suberect hairs on their anterior surfaces and tips; funicular joints tipped with short hairs. Pubescence sparse, absent, except on the funiculi, coxæ and tibiæ.

Rich yellowish-red; mandibles, clypeus and anterior portions of head, antennal scapes and sometimes also the middle and hind tibiæ, darker red. Mandibular teeth, edges of clypeus and frontal carinæ black.

Worker media. — Length 8-9.5 mm.

Resembling the worker major except that the head is smaller and the cheeks less swollen and lacking the transverse impressions. The antennal scapes are longer and the petiolar node is inclined forward and more convex on its anterior surface. Punctures absent or very faint on the head.

Worker minima. — Length, 6-7.5 mm.

Head longer than broad, with parallel sides and rounded posterior border. Mandibles 5-toothed. Clypeus broader than long, feebly carinate, without teeth and with a very faint excision in the middle of its anterior border. Antennal scapes extending about half their length beyond the posterior corners of the head. Frontal area obsolete. Petiole low and thick, with rather blunt upper border. Mandibles less coarsely punctate than in the worker major; head impunctate, glabrous. Pilosity like that of the major and media; body and appendages of a paler color and more yellow throughout. Mandibles, antennæ and tibiæ reddish.

Female. — Length, 11-11.5 mm.

Resembling the worker major, but head more elongate, with longer, straight cheeks and clypeus about as broad as long, subhexagonal. Scapes reaching about $\frac{1}{4}$ their length beyond the posterior corners of the head. Mesonotum flattened, scarcely broader than the head. Petiole high, antero-posteriorly compressed, with feebly convex anterior surface and acute upper border. In sculpture, pilosity and color much like the worker major. Head scarcely punctate on its upper surface. Wings long (12 mm.), yellowish hyaline, more grayish towards their tips, with yellow veins and stigma.

Described from a media and minima taken by Mr. C. Schaeffer at Palmerlee, Cochise County, Arizona, a winged female taken by Mr. E. J. Osler in the Huachuca Mountains, Arizona (Aug. 28, 1903), and a long series of females and workers of all sizes collected by Mr. C. R. Biederman in Carr Cañon, in the same mountain range (March 27, 1907).

This handsome species belongs to the *fallax* (*marginatus*) group of *Camponoti* and is closely related to *C. texanus* Wheeler and *C. sayi* Emery. It differs from both of these species in its uniform yellowish-red color, somewhat smoother surface, narrower and less prominently dentate clypeus in the worker major, and from *sayi* also in its larger size. It might, perhaps, be regarded as a subspecies of *texanus*. The specimens received from Mr. Biederman were found in a "nest partly in the ground and partly in rotten wood, six inches deep, at an altitude of 5,000 feet."