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with kind regards of
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ON A COLLECTION OF
FORMICIDÆ FROM LOWER CALIFORNIA
AND SONORA, MEXICO.
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ON A COLLECTION OF FORMICIDÆ FROM LOWER
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The determination and description of Formicidæ can only be accomplished in a satisfactory way if large series of specimens, taken from the colonies, are available for examination and comparison. It was with some reluctance, therefore, that I have undertaken the task of determining the small collection of ants which was brought together by Mr. Gustav Eisen and Mr. Chas. D. Haines of San Francisco, Cal. If I have ventured to describe some of the species as new, it has been done after a thorough study of the literature on the subject and after a careful comparison with the material at my command.

FORMICIDÆ.

1. CAMPONOTUS MACULATUS Fab., race OCREATUS Em.

One ♂ major, one ♀ minor. San Luis and San Esteban.

This race is found as far north as the Panamint Mountains, Cal.

The description of this new race by Prof. C. Emery will shortly be published in the *Zoologische Jahrbücher*.

2. CAMPONOTUS FRAGILIS n. sp.

♂ major: Length, 7-9 mm. Honey-yellow; posterior angles of the head, the femora and scale somewhat paler; the face between the eyes, the clypeus, disk of prothorax and the abdomen above, except a broad anterior margin of the second and third segments, brownish. Scape blackish beyond the middle. Eyes black. Mandibles reddish. Pubescence yellowish, long and slender, densest on the head, thorax and abdomen, sparse along external edge of anterior femora, with a few hairs only at the basal third or fourth of the external edge of the

median and posterior femora. A few shorter and stiffer hairs may also be observed at the apex of the femora. Appressed pubescence minute, intermixed on the scape with fine, erect hairs. Head about one-third broader than the thorax, broadest at posterior angles and gently decreasing in width towards the mandibles, emarginate behind, with the posterior angles rounded. Clypeus truncate in front, its median carina distinct. Surface of head and thorax densely and finely granulated and sparsely punctured. Abdomen with a still finer sculpture and somewhat transversely striated. Mandibles smooth, with scattered piliferous punctures; their apical edge with six black teeth. Antennæ slender, the scape reaching a little beyond the posterior angles of the head. Scale ovoid, broadest beyond the middle, stoutest at base, slightly arcuate in front, almost straight behind. Legs long and slender.

♂ minor: Length, 5-7 mm. General color somewhat paler than in the ♂ major, the head and thorax without darker shadings, the abdomen either faintly brownish or only the sutures somewhat darker. Median and posterior femora almost white. Head about twice as long as broad, scarcely broader than the thorax; its sides parallel, rounded beyond the eyes. Antennæ longer and more slender, the scape reaching nearly to the mesothorax.

It is a very delicate looking species.

The ♂ minor resembles very much that of *Camp. melleus* Say, though it is smaller, more delicate, with the head not emarginate. *Camp. melleus* differs from it also in the absence of erect hairs on the scape and in the stouter scale.

This species resembles also somewhat *Camp. atlantis* Forel, differing from it however in the form of the cly-

peus, which, in that species, is narrower and considerably extended beyond the insertion of the mandibles.

Many specimens. Taken at San José del Cabo and at San Fernando.

3. CAMPONOTUS FUMIDUS Rog.

Camp. fumidus Rog., Berl. Ent. Zeitsch., vii, p. 151.

One ♀. San Julio.

4. CAMPONOTUS MARGINATUS Ltr., var.

Formica marginata Ltr., Hist. Fourm., p. 103.

Camponotus marginatus Rog., Berl. Ent. Zts., 1862, p. 292.

Formica fallax Nyl., Form. Fr., p. 57.

Camponotus fallax Mayr, Europ. Form., p. 56.

Formica discolor Buckley, Pr. Ent. Soc. Phil., 1866, p. 166.

Formica San Sabana, Buckley, *ibid.*, p. 167.

One ♀. San Julio.

This variety is black and polished, with the scape of the antennæ and the legs dark brownish.

Similar forms are found at Washington, D. C., and in Florida. This form differs from them, however, in having a distinct constriction or suture between the meso- and metanotum and in the shape of the scale. It may possibly represent a new species, though I am not prepared to describe it as new from a single specimen.

5. CAMPONOTUS ERYTHROPUS n. sp.

♀ major, 5-7 mm; ♀ minor, 4-5 mm. Opaque black, the abdomen slightly polished. Mandibles and anterior margin of head dark cherry-brown. Antennæ, tibiæ and tarsi reddish, the tarsi somewhat darker; rest of legs black. In the smaller specimens the middle and posterior tibiæ are sometimes blackish beyond the middle. Eyes brown. Pubescence white, glistening, rather long and quite profuse. Hairs on the head above insertion of antennæ as well as those on the thorax and base of first abdominal segment finer and more slender than those on the abdomen. Hairs in front of the insertion of the an-

tennæ and those on the mandibles, short and stiff. Pubescence of the legs still shorter and more or less appressed, excepting a few longer and erect hairs at the knees; a few longer hairs may also be observed on the scape of the antennæ.

Head of ♂ major about one-half broader than the thorax, though but slightly broader in the ♀ minor; slightly longer than wide, somewhat broadest behind; its sides above insertion of the antennæ almost parallel, gently curving towards the mandibles, distinctly emarginate behind in the ♀ major, but almost straight in the ♀ minor. Clypeus straight or but faintly emarginate in front; its median carina rather indistinct. Frontal area minute, triangular. Eyes ovoid and considerably above the middle of the face, their upper edge almost in a line with the upper angles of the frontal carinæ; those of the ♀ minor almost lateral. Antennæ of the ♂ major rather stout, the scape scarcely reaching beyond posterior angles of the head, more slender and longer in the ♀ minor. Mandibles with five or six teeth, their basal half or more finely striated, the rest smooth and with scattered piliferous punctures. Head and thorax finely and densely granulated, with coarse punctures between the frontal carinæ and short, radiating, linear depressions on the vertex of the ♂ major. Prothorax somewhat flattened above.

Scale stout, broadest and truncate at apex, with the hind angles rounded; of equal thickness from base to about two-thirds its length; apical third inclining backward; the posterior face perpendicular. Abdomen with dense and fine transverse striæ and scattered piliferous punctures.

This species appears to be related to *Camp. novogranadensis* Mayr, from which it differs, however, in its

flattened and more angular prothorax, the stouter scale, finer pubescence and in the coloration of antennæ and legs.

Described from many specimens, taken at San Esteban, San Jorge, El Paraiso, San Julio, San José de Gracias and San José del Cabo.

6. *MYRMECOCYSTUS MEXICANUS* Wesm.

Myrmecocystus mexicanus Wesm., Bull. Ac. r. sc. et bell. lett. Brux., v, 1838, p. 770.

One ♂. Santa Maria.

7. *DORYMYRMEX PYRAMICUS* Rog.

Prenolepis pyramicus Rog., Berl. Ent. Zts., 1863, p. 160.

Formica insana Buckley, Proc. Ent. Soc. Phila., 1866, p. 165.

Dorymyrmex insanus McCook and var. *flavus* McCook, Cotton Ins., 1879, pp. 185 and 186.

Two ♀♀. Magdalena Island.

Differs from the typical form only in the entirely black antennæ and legs.

8. *TAPINOMA SESSILE* Say, var.

Formica sessile Say, Boston Journ. N. H. S., I, p. 287.

Tapinoma boreale Rog., Berl. Ent. Zts., 1863, p. 165.

Tapinoma boreale Mayr, Myrm. Beitr., Sitzb. d. k. Acad. d. Wissensch., liii, 1866.

Formica parva Buckl., Proc. Ent. Soc. Phila., 1866, p. 159.

Fifteen ♀♀. Margarita Island and San Jorge.

The genus *Tapinoma*, as far as known at present, is represented in North America by but one species with numerous varieties, varying in size and coloration, all of which pass so gradually from one to the other that it is almost hopeless to separate them satisfactorily. The present form is smaller and paler than most of those found in the United States, and comes nearest to var. *T. boreale* Rog.; I hesitate, therefore, without having a knowledge of the sexes, to describe this form as new.

MYRMICIDÆ.

9. PSEUDOMYRMA sp.

One ♂. Calmali mines.

This may be but a variety of *Pseudomyrma thoracica* Nort., though the specimen is only about half the size. The principal difference appears to be its coloration. Sufficient additional material would be needed to settle the question of identity.

10. ATTA VERSICOLOR n. sp.

♂. Length, about 6 mm. Color reddish-brown. Eyes and apical edge of mandibles, black. All depressions and all prominences appear to be black in a certain light, while the nodes and the abdomen, if viewed from above or in certain directions from the side, have a bright coppery reflection.

Head wider than long, deep and angularly emarginate behind; a rather broad, shallow frontal channel and laterally carinated area beyond insertion of antennæ. Posterior angles of head rounded and with a row of six or more short denticles, the last one somewhat longest; three or more teeth may also be observed along the posterior ventral edge each side, the anterior one of which being longest. Frontal laminæ broad, somewhat longer than wide, bifid at upper angle; interno-ocular carinæ distinct, curved inwards. Clypeus broadly triangular, slightly arcuate in front, with a slight median emargination. Mandibles large, triangular, their apical edge almost straight and furnished with four to six blunt, rudimentary teeth. Scape of antennæ rather short, reaching but little beyond posterior angles of the head. Thorax of the usual shape in this genus.

Prothorax with two stout spines each side, the anterior pair farthest apart, longest, inclining forward, the other two stouter, directed backward and outward; two short,

stout, backward directed median tubercles or spines in front of the middle of the mesothorax and a still shorter one each side of them at the anterior margin. Metathorax with a deep median depression, the upper edges quite acute, terminating anteriorly in a small tooth-like projection. Metathoracic spines rather long and slender, curved backward and outward.

First node of petiole triangular from a lateral view, its two dorsal and the lateral faces quite flat, the edges acute; the upper edges are provided anteriorly with two short, stout teeth, and laterally with two to three smaller denticles each side; there is also a forward directed, acute ventral tooth at base. Second node wider than long, rounded in front and at sides, truncate behind, concave above, the edges acute and beset with four or five short, acute teeth; there is also a prominent lateral carina, furnished with four or five teeth, and two ventral teeth.

Abdomen of the normal shape, the first segment with a depressed median line, and each lateral half with about twenty-five teeth, some of them bifid, arranged in irregular rows. The other segments without teeth or tubercles.

Head, pro- and mesothorax rugoso-granulate; the metathorax, legs, nodes and abdomen densely and finely granulate. Erect pubescence stiff and blackish, the appressed pubescence yellowish.

Two ♂. Taken at Calamujuet.

This appears to be related to *A. coronata* Fab., which differs from this species in the comparatively smoother surface of every part of the body, the longer mandibles and antennæ, more numerous and longer denticles of the head, much longer spines of the thorax, lower anterior node and larger and more flattened posterior node of the petiole.

11. POGONOMYRMEX BADIUS Ltr.

Formica badia Ltr., Hist. Fourm., p. 238.

Myrmica californica Buckley, Proc. Ent. Soc. Phila., 1867, p. 336.

Pogonomyrmex badius Mayr, Verh. d. k. k. zool.-bot. Gesellsch., 1870, p. 971.

One ♂. San Fernando.

12. POGONOMYRMEX BADIUS Ltr., var. ESTEBANIUS n. var.

♀. Length, about 9 mm. Color yellowish-red, the abdomen darker; the first segment with broad, blackish apical and lateral margins. Eyes black. General sculpture nearly identical with that of the typical form, but slightly stronger on the declivity of the metanotum and nodes. The first node is also somewhat larger, its sides more parallel, and the apex of the hump not so acute; while the stigma is black instead of being yellow.

♂. Length, 6-7 mm. Color darker red than in the typical form; the apical third, or more, of the abdomen more or less blackish, and the nodes often brown; the petiole is more slender and the first node longer and less erect; the apex rounded or sometimes but slightly pointed.

Two ♀♀ and many ♂♂. Calmalli Mines, San Esteban.

A few specimens from Margarita Island and San Borgia have the entire abdomen and the first node black, or very dark brown, while the second node is generally either brown or reddish and only occasionally black.

13. APHÆNOGASTER PERGANDEI Mayr.

Aphænogaster Pergandei Mayr, Verh. d. k. k. zool.-bot. Gesellsch., 1886, p. 448.

Twenty ♂♂. San Borgia and Calamujuet.

This species has been found as far north as San Bernardino Co., Cal.

14. APHÆNOGASTER SONORÆ n. sp.

♂. Length, 7-9 mm. Reddish-brown; declivity of metathorax, inner face of its thorns and more or less of base of first abdominal segment reddish. Eyes blackish-brown. The whole insect is highly polished and rather sparsely beset with medium sized, erect, pale and glistening, stiff hairs, which are densest on the head and ventral side of the abdomen, longest and finer on the under side of the head, the coxæ and ventral side of abdomen; those on under side of head are longest and gently curved forward, similar to those of *Pogonomyrmex*. Pubescence of antennæ shortest and somewhat appressed.

Head almost twice as long as broad, slightly broadest at insertion of mandibles, gently rounded beyond the eyes, with the posterior emargination almost semicircular, and about as broad as the prothorax. Its surface is densely and finely striated, the striæ extending but little beyond the eyes, except those along the middle of the face, which extend a little farther back, their ends curving inward and becoming confluent. Spaces between the striæ dense but finely granulated. Lower portions of cheeks and the vertex beyond the striæ polished and faintly shragreened. Clypeus broadly triangular, slightly arcuate in front; the spaces between the striæ smooth. Frontal area small, triangular, smooth or faintly granulated posteriorly. Mandibles large, densely striated, with a few coarse, scattered punctures; their apical edge provided with two large teeth at the apex and two or three rudimentary teeth along the edge. Antennæ long and slender, the scape reaching beyond the posterior margin of the head; the first joint of the flagellum is about five times as long as wide, the others gradually decreasing in length, the last somewhat longer than the penultimate joint.

Thorax much elongated, almost twice as long as the head, the divisions but feebly indicated. Prothorax and dorsum of mesothorax polished and delicately shagreened; the metathorax and sides of the mesothorax with dense, transverse striæ; the posterior declivity and thorns of the metathorax smooth and polished, the thorns with longitudinal striæ at base. Thorns large, gently curved, inclining backward. Nodes of the petiole polished, faintly shagreened, each with two longitudinal, impressed lines above; the highest point of the first node slightly inclining forward; second node pyriform, stoutest posteriorly. Abdomen highly polished, with scattered piliferous punctures, those of the first segment prolonged posteriorly in a depressed line of the length of the hairs. Legs long, slender and highly polished, the hairs denser and shorter than on the rest of the body.

Four ♂♂. Hermosillo, Sonora.

This may possibly be but a variety of *Aph. albisetosa* Mayr, from the description of which it appears to differ in the shape and sculpture of the thorax.

15. SOLENOPSIS GEMINATA Fab.

Atta geminates Fab., Syst. Piez., p. 423.

Myrmica paleata Lund, Ann. Sc. Nat., 1831, p. 116.

Solenopsis mandibularis Westw., Ann. Mag. N. H., vi, 1841, p. 87.

Myrmica Gayi Spin., Hist. Chile, vi, 1851.

Myrmica virulens Sm., Cat. Brit. Mus., 1858, p. 132.

Atta clypeata Sm., Cat. Brit. Mus., 1858, p. 169.

Myrmica savissima Sm., Tr. Ent. Soc. Lond., n. s., iii, 1855, p. 166.

Solenopsis cephalotes Sm., J. Proc. Linn. Soc., iii, 1859, p. 149.

Cremastogaster laboriosus Sm., J. Proc. Linn. Soc., v, suppl., 1861, p. 109.

Diplorhoptrum Drewseni Mayr, Europ. Form., 1861, p. 73.

Myrmica glaber and *polita* Sm., Trans. Ent. Soc., 3d Ser., 1862, p. 34.

Atta coloradensis Buckley, Proc. Ent. Soc. Phila., vi, 1866, p. 346.

Solenopsis xyloni McCook, Rep. on Cotton Ins., 1879., p. 188.

Four ♂♂ major, three ♂♂ minor. Comondu and Patrocinio.

The varieties of this species are almost as numerous as its synonyms. Very common in the West Indies, Florida, Alabama, Louisiana, Texas, California, Mexico, Central and South America.

16. CREMASTOGASTER LINEOLATA Say.

- Myrmica lineolata* Say., Boston Jour. Nat. Hist., i, 1837, p. 290.
Cremastogaster lineolata Mayr, Verh. d. k. k. zool.-bot. Gesellsch., 1866, p. 901.
Myrmica novæboracensis Buckley, Proc. Ent. Soc. Phila., 1866, p. 337.
Myrmica (Monomorium) marylandica Buckley, *ibid.*, p. 339.
Myrmica (Monomorium) columbiana Buckley, *ibid.*, p. 340.
Ecodoma (Atta) arborea Buckley, *ibid.*, p. 349.
Cremastogaster coarctata Mayr, Neue Formiciden, 1870, p. 992.
Cremastogaster lineolata McCook, Cotton Ins., 1879, p. 187.
Cremastogaster lineolata Mayr, Verh. d. k. k. zool.-bot. Gesellsch., 1886, p. 462.

Five ♂ ♀. San Jorge, San José de Gracias, San Ignacio.

This species is represented in North America by numerous forms, some of which, after careful study of long series of colonies from different parts of the country, may at least be entitled to variety names.