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NEW AGRICULTURAL ANTS FROM TEXAS.*

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POGONOMYRMEX DESERTORUM, sp. nov.

Worker. Length 5.5-6.5 mm.

Head rectangular, exclusive of the 7-toothed mandibles slightly broader than long; posterior margin slightly concave. Anterior border of clypeus broadly but faintly excised. Frontal area triangular, as broad as long, with a distant median carinula. Eyes in the middle of the lateral surfaces of the head. Antennal scape reaching to midway between the eye and the posterior corner of the head. Thorax of the usual shape, with two rather slender epinotal spines about as long as their distance apart at the base, directed obliquely upward, backwards and outwards. Petiole compressed at the base, its peduncle shorter than its node, which is pointed in front so that the ascending dorsal surface forms an obtuse angle in profile; posterior descending dorsal surface gently convex; lower surface of petiole with a very distinct downwardly directed tooth. Postpetiole campanulate, slightly broader than long, its ventral protuberance very small but distinct. Gaster and legs of the usual configuration.

Mandibles with coarse, parallel striae. Frontal area smooth and shining. Clypeus, sides and upper surface of head traversed by very delicate parallel rugae, which are very close together and scarcely divergent posteriorly. Interrugal punctures indistinct and in a single row between each pair of

rugae. Posterior angles of head smooth and shining. Thoracic and coxal rugae mostly transverse, even on the meso- and metapleurae. Infraspinal facet of epinotum smooth and shining. Petiole, postpetiole and legs covered only with delicate microscopic reticulation.

Trunk and legs beset with bristly pale yellow hairs which are erect on the dorsal surface of the head and thorax and suberect on other portions of the body and appendages; the erect hairs on the head are only about half as long as those on the thorax. Lower surface of head and mandibles with the usual beard of long recurved hairs. Pubescence none.

Whole ant yellowish red with the exception of the eyes and dentate mandibular edges, which are black.

This species was taken (Dec. 19, 1901) in several localities in Presidio County, Trans-Pecos Texas, from the southern end of Fresno Cañon northward through Alamito to San Esteban, which is located a few miles south of Marfa. These localities have an elevation of 4000-5000 ft. The species occurs also in New Mexico, whence I have received a worker taken by Prof. T. D. A. Cockerell at Mesilla Park ("in the *Pluchea* zone.")

At first sight *P. desertorum* resembles *P. californicus* Buckley on account of its yellowish red color. It differs, how-

*Contributions from the Zoological Laboratory of the University of Texas, No. 34.

ever, from this species in possessing epinotal spines and smooth posterior corners to the head and from this and all other described North American species in the very dense and delicate cephalic rugae.

P. desertorum inhabits the dry stony soil above the flood marks of the streams on the cañon sides where there are only a few xerophytic shrubs like *Fouquieria splendens*, *Jatropha spathulata*, *Condalia mexicana*, *Larrea mexicana*, and *Flourensia cernua*. In the open sun-lit spaces among these shrubs the ants make solitary mounds 4-6 inches across and perforated in the centre with an entrance about $\frac{1}{4}$ inch in diameter. They feed on the seeds of a coarse, tufted grass (*Munroa* sp.) which is found growing sparsely near the nests. After the diminutive seeds are removed from the relatively voluminous chaff, the latter is deposited by the ants on the mound immediately around the entrance of the nest. Occasionally the new species builds its nests under single or clustered stones like *P. imberbiculus* Wheeler.* None of the nests contained more than a dozen workers, but the weather was very cold and dry and the bulk of the colony may have been hibernating at some inaccessible depth in the stony soil. There can be no doubt, however, that the colonies of this species are very much smaller than those of *P. barbatus* and *P. occidentalis*.

*This habit is perhaps only exceptional with *imberbiculus*, for I have recently seen these ants building neat little mound nests 3-4 inches in diameter in the dry stony bluffs along the Concho River at San Angelo, Texas.

POGONOMYRMEX SANCTI-HYACINTHI, sp. nov.

Worker. Length 7.5-9. mm.

Head rectangular, exclusive of the 7-toothed mandibles as broad as long; posterior margin straight. Anterior border of clypeus with a deep, broad, almost semicircular excision. Frontal area triangular, distinctly longer than broad, convex but scarcely carinate in the middle. Eye in the middle of the lateral surface of the head. Tip of antennal scape reaching to midway between the eye and the posterior angle of the head. Thorax shaped like that of *P. barbatus* but without epinotal spines, their position being indicated in some specimens by a pair of rather short indistinct ridges or projections. Petiole short, the node longer than the peduncle and much lower and blunter than in *barbatus*, the anterior ascending and posterior descending dorsal surfaces of about equal length, the former slightly concave in profile but not distinctly angular as in *barbatus*, the latter depressed in front and slightly concave behind. Tooth on the ventral surface of petiole obsolescent. Postpetiole campanulate, slightly longer than broad, evenly convex above, its ventral protuberance very slightly developed as compared with *barbatus*. Gaster and legs of the usual appearance.

Mandibles shining, coarsely and deeply striated. Frontal area opaque. Front and sides of head covered with numerous, parallel, clean-cut rugae and with small piligerous punctures. The rugae are somewhat finer than those of *barbatus* and scarcely diverging except on the extreme posterior portion of the head. Interrugal sculpture indistinct, consisting of very shallow, confluent foveolae. On the posterior angles the rugae are replaced by a delicate reticulation and this disappears to leave the corners of the head smooth and shining. Thoracic sculpture like that of the typical *barbatus* but somewhat finer, the prevailing directions of the rugae being transverse on the pro- and epinotum and longitudinal on the mesonotum

and meso- and metapleurae. Petiole, post-petiole and gaster shining, covered with delicate, even, microscopic reticulation. Upper surface of petiolar node with a few faint longitudinal rugae. Coxae faintly rugose and, like the remainder of the legs, covered with delicate microscopic reticulation.

Body and appendages beset with bristly, pale yellow hairs, very long and projecting forward on the clypeus, shorter and erect on the upper surface of the head and thorax, suberect on the remainder of the body. Beard of long, recurved hairs on the lower surface of the head and mandibles well developed. Pubescence none.

Whole ant deep ferruginous red, excepting the following portions which are black: dentate edges of mandibles, anterior border of clypeus, eyes, ventral edges of the pleurae and sutures between the petiole and post-petiole and between the latter and the gaster.

Described from numerous specimens collected in the open spaces among the dry chapparal and mesquite thickets near San Pedro Springs, San Antonio, Texas, on the anniversary of the battle of San Jacinto (April 21, 1902).

P. sancti-hyacinthi superficially resembles *P. barbatus* var. *molefaciens* Buckley but besides its somewhat smaller size the new species may be very readily distinguished by its very deeply excised clypeus, the straight occipital border, the smooth and shining posterior angles of the head,* the absence of the epinotal spines, the smooth petiole and post-petiole, the much more depressed and rounded petiolar node and obsolescent

ventral tooth, and the conspicuously smaller ventral protuberance of the post-petiole. It differs from *P. californicus* in its larger size, deeper coloring, the extent of the clypeal excision, smooth posterior angles of the head and blunter petiolar node.

Although it is very easy at first sight to confound *P. sancti-hyacinthi* with *P. molefaciens*, which occurs in the same locality, this is not the case with the nests of the two species. Instead of huge gravel cones or extensive discs, the former species builds only small, flat, dirt-cones, sometimes in close clusters of two, three or four, and each measuring not more than 4-8 inches across, with a central perforation about $\frac{1}{4}$ inch in diameter. The periphery of each mound is often covered with a thick layer of chaff and other vegetable debris which has been cast away by the ants and may become the abode of colonies of termites. The nests are much less populous than those of *P. molefaciens*.

POGONOMYRMEX BARBATUS F. Smith
var. NIGRESCENS, var. nov.

The worker of this striking variety differs from the typical *barbatus* of Mexico in its smaller size and the deep reddish black coloration, not only of the head and thorax as in the Mexican form, but also of the antennal scape, petiole, postpetiole, gaster and femora. The tip of the gaster is very nearly as dark as the base. Mandibles, funiculus, tibiae, tarsi and peduncle of petiole deep ferruginous red. Sculpture like that of the

*The last character is sometimes, though rarely, found in *barbatus*.

typical *barbatus*, the rugae being often very coarse and irregular on the pronotum. Coarse hair covering the body grayish white; beard rather scanty and almost absent in several of the specimens.

Described from 14 workers kindly given me by Mr. A. M. Ferguson. They were collected at Eagle Pass, Tex. by a lady who found them carrying away the buds of the singular gnetaceous *Ephedra antisyphilitica*. Two other specimens which evidently represent a transition to *P. barbatus* var. *marfensis* Wheeler were collected at Mesa Negra, San Ildefonso, New Mexico by Mr. E. L. Hewitt and Miss Ruth Reynolds. In these specimens the petiole and postpetiole are red, the former being distinctly grooved longitudinally. The beard is well developed.

The addition of the preceding variety and two species to our fauna leads me to revise my recently published table of the North American *Pogonomyrmex*.* A third species, *P. schmitti* from Hayti has also been recently described by Forel.† As this West Indian species, the Texan *imberbiculus* Wheeler and the Brazilian *nägeltii* Forel form a compact group of forms more closely related to one another (in size, sculpture, absence of beard, etc.) than to any other species of the genus, they may be included in a distinct subgenus for which I would propose the name *Ephobomyrmex*.

Pogonomyrmex sensu lato would then comprise the species of the genus proper, the subgenus *Janetia* Forel (with the single species *J. mayri* Forel from Colombia) and the subgenus here proposed. The workers of the nine known North American species of *Pogonomyrmex* may be distributed as follows:

*Small species, less than 5 mm. long; under surface of head without a beard of long recurved hairs; epinotum with four spines; head, thorax and petiole reticulate-rugose. (*Ephobomyrmex*, subgen. nov.)

1. Color. red — *imberbiculus* Wheeler.

2. Color black — *schmitti* Forel.

*Large species, more than 5 mm. long; under surface of head with beard of long recurved hairs; epinotum unarmed or with only two spines; head and thorax finely rugose, the rugae parallel and not distinctly reticulate. (*Pogonomyrmex* s. str.)

†Epinotum with a pair of spines.

§ Posterior angles of head smooth and shining. Sculpture of head and thorax very fine. *desertorum*, sp. nov.

§§ Posterior angles of head not smooth and shining. Sculpture coarser.

A. Head evenly and finely rugose, rugae but little divergent posteriorly, without distinct inter-rugal sculpture. *barbatus* Smith.

1. Head, thorax and legs black; petiole, postpetiole and gaster red.

barbatus Sm (*typical*).

* Am. Natur. Vol. XXXVI No. 422, 1902, pp. 97-99.

† Ann. Soc. Entomol. Belg. Tome XLV, 1901, pp. 339-

2. Cephalic rugae finer and denser, body ferruginous throughout.

var. *molefaciens* Buckley.

3. Head and thorax brownish red, gaster in part or entirely brown, rugosity as in No. 2 or somewhat coarser.

var. *fuscatulus* Emery.

4. Rugosity a little coarser than in No. 1; head, thorax and legs black, petiole and postpetiole brown, abdomen red, node of petiole longitudinally rugose.

var. *marfensis* Wheeler.

5. Color reddish black, peduncle of petiole, tibiae, tarsi and funiculus red; sculpture as in no. 1; beard scanty.

var. *nigrescens*, var. nov.

6. Head and thorax much more coarsely rugose than in Nos. 1-4. Rugae irregular in direction on the pro- and mesonotum, transverse elsewhere on the thorax. Petiole rather coarsely and irregularly rugose; its peduncle shorter than in No. 1; postpetiole rugose-punctate.

subsp. *rugosus* Emery.

B. Head less densely rugose; the rugae distinctly divergent posteriorly; interrugal spaces densely and distinctly foveolate-punctate.

a. Ventral surface of petiole without a distinct tooth; in-

fraspinal facet of epinotum rugose, scarcely shining.

occidentalis Cresson.

1. Head opaque, interrugal punctures very distinct.

occidentalis Cr. (typical).

2. Head more shining, interrugal punctures less pronounced; petiole less opaque than in No. 1.

var. *subnitidus* Emery.

b. Petiole with a distinct tooth below; infraspinal facet of epinotum shining, without rugae. *subdentatus* Mayr.

† † Epinotum without spines.

§ Posterior angles of head smooth and shining; clypeus deeply excised. *sancti-hyacinthi*, sp. nov.

§ § Posterior angles of head not smooth and shining; clypeus not deeply excised.

a. Interrugal spaces of head indistinctly and confluent punctate; workers monomorphic. *californicus* Buckley.

1. Color yellowish red, peduncle of petiole about the same length as the node; postpetiole as high as long. *californicus* Buckley (typical).

2. Darker red: apical third or more of gaster black; petiole and postpetiole often brown, the former slender, its node longer and less erect with rounder or but slightly pointed apex.

var. *estebanius* Pergande.

3. Yellowish red, gaster brown except at the base; peduncle shorter than the very long node, which is pointed above; postpetiole not as high as long. Sculpture fainter than in No. 1, petiole and postpetiole punctate, without rugae.

subsp. *longinodis* Emery.

b. Interrugal spaces of head regularly foveolate-punctate. Color ferruginous red. Workers polymorphic, *i. e.* with size of head greatly varying.

badius Latr.

AUSTIN, TEXAS, May 10, 1902.

POSTSCRIPT.

As the result of recent collecting trips in Central and Trans-Pecos, Texas, I am able to add the following brief notes on some of the species of *Pogonomyrmex* of the above table and on a new species and subspecies which came to light too late to be included.

1. *Pogonomyrmex apache*, sp. nov. This is a fine orange-yellow species, nearly as large as *barbatus*, with smooth posterior angles to the head and without epinotal spines. It is decidedly larger and more robust than *californicus*, which it resembles in sculpturing, and the cone of the petiole is blunter and more depressed. It differs from *sancti-hyacinthi* in coloration and in having a less deeply excised clypeus. Only four isolated nests of *apache* were seen. These were excavated in the dry, stony,

adobe soil about Fort Davis in Jeff Davis County. They were in the form of small chaff-strewn mounds, 3-5 inches across, perforated with an entrance about $\frac{1}{2}$ inch in diameter, and containing hardly more than 25-50 workers. Nearly all the workers were busily engaged carrying home grass-seeds. When running they carried the abdomen in a peculiar elevated position.

2. *P. occidentalis* subsp. *comanche*, subsp. nov. This form differs from the typical *occidentalis* and resembles *subnitidus* Emery in the less opaque surface of the head and thorax. It is mainly distinguished, however, by the very short epinotal spines, which are hardly half as long as those of the typical form. It was discovered near Milano, Millan County, in the sandy soil of the open post-oak woods. Here it constructs small mound-nests not more than 4-6 inches across and very unlike the great gravel cones constructed by the typical form in Wyoming and Colorado. There were not more than 50 ants in a nest. At Langtry, in Valverde County, small colonies of the typical *occidentalis* were seen inhabiting similar nests on a sandy spot in the Cañon of the Rio Grande.

3. *P. sancti-hyacinthi*. This species is common at Fort Davis, where it builds small obscure nests among the disintegrating volcanic rocks on the summit of the "Crouching Lion" (altitude about 5400 ft.). While running this species does not carry the abdomen conspicuously erect.

4. *P. desertorum*. Several fine nests

of this species were seen at Langtry, both in the sandy soil of the Rio Grande Cañon and in the stony adobe on the desert hills. These nests were more populous than those observed in Presidio County during the winter of 1901. They sometimes contained upwards of a hundred workers. While running the ants carry the abdomen in a peculiar erect position.

5. *P. californicus*. This species, not before recorded from Texas, is common on the sandy soil of the desert near the cemetery at Marfa, Presidio County. The colonies are smaller than those of *P. desertorum*. It is impossible to find the entrance to the obscure nest, a small hole in the ground, without tracing foraging ants on their return journey. The insects run with conspicuously elevated abdomen. They sting severely.

6. *P. barbatus* var. *nigrescens*. This variety is not uncommon at Del Rio, Langtry, Toronto, near Alpine, and at Fort Davis. It sometimes builds a gravel disc like other varieties of *barbatus*, but at Del Rio and Langtry it was found inhabiting small obscure nests in the stony adobe soil, without making any effort to clear away the vegetation about the entrance. Some of the nests were even excavated about the roots of the small desert acacias, a most unusual habit for *barbatus*. The males and females, which were abundant during early June at Fort Davis, are deep ferruginous red throughout.

7. *P. barbatus* var. *marfensis*. In this form the males and females are col-

ored like the workers, i. e. the head and thorax are black, the gaster bright red. The microergates of incipient nests have the same coloration as the large workers of old nests. *P. marfensis* is the dominant Pogonomyrmex in Brewster and Presidio Counties at or below an altitude of 5000 ft., where it makes huge gravel discs. So far as my observations extend, the variety *molefaciens* does not occur in these counties. The variety *nigrescens* lives at a higher altitude (above 5000 ft.) except further east (at Del Rio and Langtry) where it shares the lower open country with *molefaciens*.

ROCKFORD, ILLINOIS, July 12th, 1902.

NOTES.—Mr. Walter Deane observed a worn specimen of *Basilarchia arthemis* in Cambridge, Mass., July 14.

Cryptorhynchus lapathi Linné is to be recorded from N. H. and Maine; in Maine Mr. J. G. Jack has found it very abundant on willows and poplars at York.

In a Revision of the Cicindelidae of Boreal America (Trans. Amer. ent. soc., 1902, vol. 28, p. 93-186, pl. 1-4) Leng recognizes four genera, *Amblychila* with three species, *Omus*, ten species and four varieties, *Tetracha* two species, *Dromochorus* two species, and *Cicindela* seventy-three species and fifty-five varieties, a total of ninety species and fifty-nine varieties. Five new species and ten new varieties are described. Plate 1 plots the distribution of the species and varieties of *Omus*, with the exception of *O. montanus*, in California; plate 2 shows the variation of the labrum, the form of the mandible, the apex of the elytra, and types of elytral maculation, and on plates 3 and 4 the elytral markings of 53 species and 20 varieties of *Cicindela* are figured.