

NOTES ON THE PHEIDOLE PILIFERA (ROGER)
COMPLEX AND A DESCRIPTION OF A NEW
SUBSPECIES (HYMENOPTERA: FORMICIDAE)¹

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The writer has examined numerous series of *Pheidole pilifera* (Roger) from a large number of localities. Although there is a considerable amount of normal variation in sculpture, development of the postpetiolar connules, size, and color of the major, the head in all of the specimens examined has prominent transverse rugae on the occiput and extending down upon the front face of the occipital lobes, and the longitudinal cephalic rugae extend entirely across the vertex. I can find no distinct characteristics of clinal significance. Specimens from Nebraska compare very favorably with those from Massachusetts, and series from Ohio and Indiana are apparently not significantly different from those of Tennessee and Mississippi. In all localities, normal variation as mentioned above is obvious.

Three subspecies of *pilifera* have thus far been recognized (Creighton, 1950, p. 165) namely, *coloradensis* Emery (Colorado and northern New Mexico), *artemisia* Cole (Provo, Utah), and *pacifica* Wheeler (southern California). I have in my collection a series of what I consider to represent *artemisia*. These specimens were taken from a colony beneath a small stone at Shoshone Canyon of the Snake River near Twin Falls, Idaho. The nest was on a dry slope covered with bromegrass. If I am correct in my determination, the range of *artemisia* is extended northward to a considerable distance from the type locality.

From Magdalena, New Mexico, I collected a series of major and minor workers of what I believe to represent, on the basis of morphologic and geographic data, a new subspecies of *pilifera*. A description follows.

Pheidole pilifera subsp. **anfracta** n. subsp.

Holotype. Worker major (Cole Coll. No. N-307). Length, 5.0 mm. Differs from that of *pilifera* and its known subspecies in the following combination of characteristics: cephalic longitudinal rugae do not cover entire vertex, but are interrupted below the front face of each occipital lobe by a distinct, shining area which bears a few coarse, piligerous punctures and foveae as well as a few, short, scattered, irregular, longitudinal rugules; the longitudinal rugae then continue irregularly in a broad transverse arc across the front faces of the occipital lobes and to the posterior corners of the head; coarse, irregular, occipital rugae are present and extend well down on the front of the occipital lobes; there is a tendency to form distinct reticulations on the occipital lobes; surface between cephalic rugae rather shining; humeri of alitrunk with coarse, widely spaced, longitudinal rugae; anterior declivity of pronotum smooth and very shining; mesonotum with coarse, transverse rugae; base of epinotum

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rugulose; top of postpetiolar node with transverse rugulae; postpetiolar connules very well developed; body long and robust, its color a piceous brown.

Paratype. Worker minor (Cole Coll. No. N-307). Apparently indistinguishable from that of *pilifera* Roger.

Type locality. Seven mi. W. Magdalena, New Mexico, Sept. 10, 1951, A. C. Cole, collector. The holotype and a series of 9 paratype workers major and 35 paratype workers minor was taken from a nest beneath a stone in a semi-desert grassland with scattered juniper at an elevation of 6,850 feet.

Disposition of Types. The holotype and a series of paratypes are in the writer's collection. Paratypes have been deposited in the U. S. National Museum and in the Museum of Comparative Zoology (Harvard).

Affinities. The new form is closely related to the typical *pilifera* from which it can be separated readily by the cephalic rugosity of the major. The longitudinal rugae do not extend across the vertex in the new form. From the subspecies *coloradensis* the new ant differs noticeably in its coarse occipital rugae which extend well down over the anterior faces of the lobes. From the subspecies *artemisia* the major of the new form differs notably in sculpturing and size. The coarse, longitudinal rugae on the humeri of the alitrunk; the coarse transverse rugae on the mesonotum; the downwardly curved inner ends of the rugae of the occipital lobes; and the transversely rugulose crest of postpetiolar node are not applicable to *artemisia*. The body of the new form is considerably longer and more robust, and the postpetiolar connules are much better developed.

Variation in the paratype series. A few of the majors have the occipital rugae less reticulate than do others. The length of the major varies from 4.5 mm. to 5.1 mm.

Discussion. The geographic location of the new form is, in my opinion, distinctive enough to allocate the ant subspecifically. I have taken *pilifera coloradensis* only from northern New Mexico. The typical *pilifera*, from which the new form can be readily separated morphologically, is not known from the state and has been recorded only as far west as Nebraska, which, in my estimation, precludes the likelihood that the series from New Mexico represents a southwestern extension of the range of *pilifera*. The workers major seem certainly not referable morphologically to either the subspecies *coloradensis* or *artemisia*. I have considered the possibility that the new form might represent an intergrading population but have ruled this out on the basis of the data available. If the new form represents a geographic race, as I suspect, then it is to be expected that intergrades of the new form and *coloradensis* will be collected in the future, and possibly also those of the new subspecies and *artemisia* may turn up. I have in my collection a series of what may represent intergrades of the new form and *artemisia*. This was taken at Navajo Springs, Arizona. More such collections will have to be made, however, before this possibility can be substantiated. The Arizona major workers do not bear the coarse (and frequently reticulate) occipital sculpturing of *artemisia* and the new form, they are intermediate in size, and they vary in other respects from both forms.

There follows a key, adapted from that of Creighton (1950, p. 163), to the major workers of the known forms of *Pheidole pilifera*.

1. Transverse rugae on the occiput prominent and usually extending well onto the front face of the lobes..... 3
 Transverse rugae on the occiput feeble, sometimes replaced by transverse rows of small granules, the transverse sculpture in either case largely confined to the top of the occiput..... 2
2. The portion of the head in front of the occipital lobes with numerous coarse foveae and granulations, the surface at most feebly shining..... *P. pilifera coloradensis* Emery
- The portion of the head in front of the occipital lobes with only small, piligerous punctures, the surface strong shining..... *P. pilifera pacifica* Whlr.

3. Head with longitudinal rugae extending entirely across the vertex; interrugal spaces on the vertex finely punctured and scarcely shining
P. pilifera (Roger)
- Head with longitudinal rugae not extending entirely across the vertex; the latter area distinctly shining and with coarse punctures or foveae..... 4
4. Humeri of alitrunk with coarse, longitudinal rugae, mesonotum with coarse, transverse rugae, inner portions of rugae of occipital lobes downwardly curved *P. pilifera anfracta* n. subsp.
- Humeri of alitrunk without coarse, longitudinal rugae, mesonotum without coarse, transverse rugae, inner portions of rugae of occipital lobes not downwardly curved *P. pilifera artemisia* Cole

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LITERATURE CITED

- Creighton, W. S. 1950. The ants of North America. *Bull. Mus. Comp. Zool.*, 104.

NEWS OF TENNESSEE SCIENCE

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American Gynecological Association.

Dr. John L. Wood, professor of chemistry at the University of Tennessee Medical Units, became head of the Department of Biochemistry on July 1.

RECENT PUBLICATIONS BY TENNESSEE AUTHORS

- Anderson, Elda E. (ORNL). 1952. Units of radiation and radioactivity. *Public Health Reports*, 67; No. 3.
- Anderson, E. H. (ORNL). 1952. The effect of oxygen on mutation induction by X-rays. *Proc. Natl. Acad. Sci. U. S.*, 37: 340-349.
- Anderson, Norman G., and Karl M. Wilbut (ORNL). 1952. Studies on isolated cell components. IV. The effect of various solutions on the isolated rat liver nucleus. *Jour. Gen. Physiol.*, 35: 781.
- Arfken, G. B., E. D. Klema, and F. K. McGowan (ORNL). 1952. Gamma-gamma angular correlation in Pd^{106} . *Phys. Rev.*, 86: 413.
- Arnold, W. A., E. W. Burdette, and J. B. Davidson (ORNL). 1951. A recording Warburg apparatus. *Science*, 114: 364-367.
- Bernard, Louis J., William C. Jefferson, and Paul F. Hahn (Meharry). 1952. Failure to demonstrate in vitro lysis of sensitized guinea pig leucocytes by dog hemoglobin antigen. *Proc. Soc. Exper. Biol. & Med.*, 80: 58-60.
- Billen, Daniel, and Herman C. Lichstein (U. T., Knoxville). 1952. The effect of x radiation on the adaptive formation of formic hydrogenase in *Escherichia coli*. *Jour. Bact.*, 63: 533.
- Bizzell, O. M., W. T. Burnett, Jr., P. C. Tompkins, and L. Wish (ORNL). 1951. Phosphorus-bakelite beta-ray sources. *Nucleonics*, 17: 27.
- Boyd, G. E. (ORNL). 1952. Gamma-radiations from 36.5-hr $Rh^{106}g$. *Phys. Rev.*, 86: 578.
- Burnett, William T., Jr., Robert H. Bigelow, Allyn W. Kimball, and Charles W. Sheppard (ORNL). 1952. Radiomanganese studies on the mouse, rat and pancreatic fistula dog. *Amer. Jour. Physiol.*, 168: 620.
- Burnett, W. T., Jr., M. L. Morse, A. W. Burke, and A. Hollaender (ORNL). 1952. Reduction of the x-ray sensitivity of *Escherichia coli* by sodium hydrosulfite and certain other inorganic sulfur compounds. *Jour. Bact.*

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