Suggestions Concerning Taxonomic Nomenclature of the Hymenopterous Family Formicidae, and Description of three New Ants

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Suggestions Concerning Taxonomic Nomenclature of the Hymenopterous Family Formicidae, and Descriptions of three New Ants

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The writer is convinced that authors of descriptions of new ants who deal with categories less than species have very often violated our accepted rules of nomenclature. The status of a great many described kinds of ants is definitely insecure at present because of these inaccuracies. The purpose of this paper is an attempt to clarify these inconsistancies and to describe three new ants on the basis of a more scientific method.

From the standpoint of taxonomy, "if a group of closely similar individuals, or an individual which may represent such a group, is distinguished from another by one or more nonintergrading structural characters, it may be regarded as a species, unless and until it can be shown not to merit that distinction." [1] It happens that such species are seldom relegated to lower categories unless, of course, they are found to be synonymous with certain subspecies. More often, however, they lose their distinction by becoming merely synonyms of previously indicated species. This usually occurs because of the failure of the describer properly to examine, through neglect or carelessness, authentic representatives of the already described members of the genus.

If a group of closely similar individuals, or a representative of that group, is geographically or ecologically isolated from a species and possesses characters which separate it from the species, but with which it intergrades, it may be considered as a subspecies. Thus it becomes necessary to recognize both geographic and ecologic subspecies. Ecologic subspecies are probably more numerous in the Formicidae than one might suppose. Some botanists have used the term "ecotype" [2] to indicate a habitat type for plants. Turesson proposed the term "ecospecies" [3] to define Linnaean species or genotype compounds as they are found in Nature. The ecotypes are the ecologic units of Turesson's ecospecies. Naturally, a great range of combinations of characters is possible within an ecospecies. Thus an ecologic subspecies of an ant, for example, is comparable to an ecotype, in that it is an ecologically isolated unit. McAtee [4] indicates that it may become necessary to recognize both geographic and ecologic subspecies.

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1 Ferris, G. F., *The Principles of Systematic Entomology*, Stanford Univ. Press, 1928; p. 57.
2 Barton-Wright, E. C., *Recent Advances in Botany*, J. & A. Churchill, London, 1932; p. 86.
3 *Hereditas*, IX, (1927).
4 McAtee, W. L., *Ent. News*, XXXI, (1920), p. 53.

The term "variety" has been subjected to considerable abuse in myrmecological literature. Many workers have classed as varieties those forms which vary from the typical one in size, in color or in a combination of these. Ant literature is replete with descriptions of varieties of both species and subspecies. The advisability of assigning varietal rank to any kind of ant is very questionable, especially when we consider our loose interpretation of the term. The only excuse, as I see it, of a varietal status for ants is that it affords us a category in which to put color variants. As McAtee [5] contends, we shall sooner be able to determine what color varieties are if named rather than unnamed. I can see no desirability whatever of recognizing varieties of subspecies of ants, in spite of the fact that this has been done extensively. Since a subspecies is an ecologically or geographically isolated unit which intergrades with the typical species, its variants as such would have to intergrade with the species and would furthermore be isolated within the ecologic or geographic boundaries of it. Since this so-called variety would necessarily intergrade also with the species *sensu stricto*, and since it would, of course, be ecologically or geographically isolated from it, it should, I believe, be actually relegated to subspecies rank.

Too often the varietal status is given to a clearly recognizable form which should undoubtedly belong in a higher category. For example, a recently described ant, *Pogonomyrmex occidentalis* var. *utahensis* Olsen [6] was given varietal rank as shown here. Four distinct characteristics separate the worker from the typical species; all pertain to structure. In other respects it is apparently identical to the typical species. Yet these different structural characters could actually place it in the species category. Furthermore, the type locality for *utahensis* is Zion National Park, Utah. While the elevation of the habitat or any information concerning the habitat is entirely omitted in the published paper, it is possible that *utahensis* may actually be a subspecies because of ecological isolation. I made collections of ants in the Park during the summer of 1931, and among these I have series of workers from four nests of what is now *utahensis*. The ants were taken from small pebble-mound nests in a deep ravine. Elsewhere in the Park I found nests of the typical *occidentalis*. Although evidence in this case is far from conclusive, there is a distinct possibility that factors of ecologic isolation reacted to produce by selection what may actually be a true subspecies. Hence, there is a possible choice in the case of *utahensis* of elevating it to the rank of subspecies or of species. Obviously, it remains in too low a category.

It is refreshing to see a recently published paper on new species of ants which exemplifies thoroughness in description and accuracy in nomenclature.[7] In this article the ants—all of the genus *Formica*—are given specific rank in each case because they possess the required one or more nonintergrading structural characters. There is little doubt that some myrmecologists would quite erroneously have given these ants only subspecific rank.

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5 McAtee, *ibid.*

6 Olsen, O. W., *Bull. Mus. Comp. Zool.*, LXXVII, (1934), p. 509.

7 Kennedy, C. H. & C. A. Dennis, *Ann. Ent. Soc. Amer.*, XXX, (1937), pp. 531-544.

It is apparent that in order to prevent the classification of Formicidae from attaining a more chaotic condition, the rules of nomenclature must be followed more conscientiously. The rather vague and unsatisfactory methods of the past need to be discarded and replaced by thoroughly scientific procedure.

Leptothorax tennesseensis sp. nov.

Holotype, worker (Cole collection No. C-T-2068). (Fig. 1).

Total length, 2.8 mm. (Paratypes, 2.8-3.0 mm.).

Head subrectangular, excluding mandibles slightly longer than broad; posterior border slightly concave; posterior angles rounded; sides subparallel. Eyes ovoid and convex. Mandibles rather broad, curved, overlapping, 4-toothed; apical tooth long, rather sharp; second tooth half as long as apical tooth, more blunt; third tooth short, blunt; fourth tooth longer than third, about half as long as second, sharper, more slender; basal teeth minute. Clypeus moderately convex, broadly rounded in front, anterior margin deeply and broadly excised; without a median longitudinal carina. Frontal area present. Antennae 12-segmented; scape extending one-fourth its length beyond posterior angles of head; first funicular joint shorter than the three succeeding joints taken together; club 3-jointed, apical joint longer than the two basal joints which are subequal.

Fig. 1. Lateral view of the thorax of *Leptothorax tennesseensis* n. sp., showing contours.

Thorax robust; pro- and mesonotum convex; mesoepinotal constriction deep and broad; neck rather long; cervical declivity of pronotum not sharp. Epinotal spines moderately short, less than the distance between their bases which is exactly equal to the width of the petiolar node; rather sharp; directed upward and only slightly backward. Legs robust with incrassated femora. Petiole, viewed in lateral profile, with rather low convex node, its apical border truncate; anterior slope long, posterior slope shorter and more abrupt; somewhat flattened; ventral surface of peduncle without a tooth. Postpetiole much larger than petiole, broader but not higher; dorsal surface in profile very convex; broader than long. Gaster oval, much narrower than head, subtruncate at base.

Mandibles finely and longitudinally striated. Clypeus shining, very finely and sparsely punctate. Head smooth and shining; very finely and sparsely punctate, especially on vertex. Antennal fovea with curved parallel rugae; frons and genae with straight rugae. Frontal area of head subopaque and delicately rugose. Pronotum and dorsum of mesonotum smooth and shining; anterior declivous surface of pronotum with a very few parallel transverse rugulae; pleurae of meso- and epinotum coarsely reticulate-rugose, very

coarsely and deeply punctate; mesoepinotal constriction, and dorsum of epinotum, coarsely and longitudinally rugose. Declivous surface and epinotum smooth and shining. Petiole and postpetiole shining and reticulate above, more opaque and reticulate-rugose on the sides. Gaster smooth and shining.

Hairs long, slender, pointed and very abundant; suberect on antennae and legs; erect elsewhere.

Thorax rich light tan; antennae, dorsum of head except mandibles, postpetiole and gaster much darker; mandibular teeth and tips of epinotal spines dark tan (color of head); apex of antennal club yellow.

The holotype was selected from a series of eight workers collected by the author where they were attending aphids on stems of *Senecio smalli* in an area of *Andropogon virginicus,* near Greenbriar Cove, Great Smoky Mountains National Park, Tennessee (Elev., 2000 ft.), May 15, 1937. Several hours of careful observation of *S. smalli,* which was in full bloom, netted only these eight specimens. They were found intermingled with numerous workers of *Monomorium minimum* Buckley. *L. tennesseensis* is a beautiful little ant whose pilosity, as revealed by a lens, makes it even more striking.

L. tennesseensis differs from *pergandei,* its closest relative, in the following respects: (1) It has only four prominent mandibular teeth; (2) the first funicular joint of the antennae is shorter than the three succeeding joints taken together; (3) the apical joint of the antennal club is longer than the two basal joints taken together; (4) the epinotal spines are longer; (5) the apical border of the petiolar node is truncate; (6) the ventral surface of the peduncle of the petiole does not bear a tooth; (7) the anterior declivous surface of the pronotum has a few delicate parallel rugae; and (8) the color of the body is lighter and the tips of the antennal club are yellow.

Aphaenogaster texana punctithorax subsp. nov.

Holotype, worker. (Cole collection No. C-T-2186). (Fig. 2).

Total length, 3.8 mm. (Paratypes, 3.5-4.0 mm.).

Head very slender, including mandibles twice as long as broad, narrowed behind the eyes. Eyes large. Antennae long, their scapes extending one-third of their length beyond the posterior border of the head; without prominent lobe at base; joints of funiculi long and slender. Basal teeth of mandibles large and nearly the size of apical teeth. Epinotum long, its spines rather short, acute, directed upward and backward. Postpetiole large compared with petiole, its node rounded.

Fig. 2. Lateral view of the thorax of *Aphaenogaster texana* supsp. *punctithorax* n. subsp., showing contours and position of hairs.

Head and thorax subopaque and very densely and rather coarsely punctate; petiole and postpetiole sparsely and more finely punctate. Lateral surface of epinotum with several coarse parallel rugae. Clypeus subopaque, rough, somewhat rugose. Posterior corners of head, legs, declivous surface of epinotum and gaster smooth and shining.

Hairs sparse, erect, rather short, blunt, of almost uniform size; most dense on vertex of head, and on postpetiole and gaster; sparse on pronotum and especially on mesonotum; almost absent on epinotum except for a single pair on dorsum; absent on venter of thorax; longer, more pointed and slender on coxae and on gula and frons of head; very blunt on vertex of head; appressed on antennae.

Color, a rather uniform dark grayish brown under magnification, grayish black without magnification; legs and antennae dusky yellow; antennal scapes somewhat infuscated; hairs yellow.

The holotype was selected from a series of five workers taken by the writer from a minute surface nest beneath a rock on a wet, deciduous forested slope of Gregory's Bald (Elev., 3500 ft.), Great Smoky Mountains National Park, Tennessee, October 19, 1937. The queen could not be located. There were four small larvae in the single nest chamber. The habitat suggests distinct geographic isolation.

A. texana punctithorax differs from typical *texana* and from its described subspecies and varieties in the following respects: (1) Smaller size; (2) head and especially the thorax more coarsely punctate; (3) clypeus very rough and subopaque; (4) hairs much more sparse; and (5) color rather uniform dark grayish brown.

Pogonomyrmex occidentalis owyheei subsp. nov.

Holotype, worker. (Cole collection No. 1004).

Total length, 5 mm. (Paratypes, 5.0-5.5 mm.).

Differs from the worker of *P. occidentalis* Cresson, which is a very common mound-building ant in the western United States, in its much smaller size (*occidentalis* varies between 7 and 10 mm.) and its paler color. Its color is a light yellowish tan, while the worker of the typical *occidentalis* is a claret brown.

Paratype, nest queen. (Cole collection No. 1004).

Total length, 8 mm.

Differs from the queen of the typical *occidentalis* as follows: Entire body, except pronotum, densely beset with robust, yellowish, erect and suberect straight hairs; blunt on thoracic dorsum, pointed elsewhere; longest and most numerous on petiole, postpetiole and gaster; shorter on head and thorax; sparse on prothorax. Epinotal spines shorter and more blunt. Head, antennae, legs and thorax tan; petiole, postpetiole and basal segment of gaster light brown; other segments of gaster deep brown.

The holotype was selected from a series of more than one hundred workers taken by the author from mound nests in pure sand in a sand dune area at Indian Cove, near Hammett, Idaho, September 30, 1931.

This ant is treated as a subspecies for the following reasons. The habitat of *owyheei* is far different from that of the typical species. *Owyheei* constructs its nests only in pure sand, where it makes small mounds with single central entrances. These nests were abundant at the type locality. Although large pebble mounds of the typical *occidentalis* were plentiful in the large *Artemisia tridentata* (sagebrush) area surrounding the dunes, none was found in sand. Like other members of the genus, *owyheei* is primarily a harvester. Border of chaff were found near the nest openings. Such circles of chaff are very seldom found on or around mounds of the typical species.

Series of specimens were taken from dozens of nests of *owyheei* in the dune area. All workers varied in length only within the limits ascribed above, and this consistency was maintained throughout specimens from all nests sampled in the dune area. This ant has also been collected from sand hills in Clear Lakes Canyon, near Buhl, Idaho. It is apparently restricted in distribution to hot, dry, sandy habitats. It has never been found on the sagebrush plains with *occidentalis*.

This probably represents a distinct case of ecologic (habitat) isolation. There is evidence that there has been a selection of characters favorable to the development and maintenance of *owyheei*. This would tend to explain the small size of *owyheei*, its pale color, its habitat and type of nest.

Type material of the ants described in this paper is in the author's collection.

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