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The Status of Two Common North American Carpenter Ants

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In his recent book, "Ants of North America," Dr. W. S. Creighton has made a very important advance in the taxonomy of the familiar carpenter ants belonging to the *Camponotus* (s. str.) *herculeanus* group. Among the chief points of interest in this treatment is the recognition of the synonymy of *herculeanus* var. *whymperi* with the "typical" *herculeanus*. This synonymy will no doubt be applauded by sensible myrmecologists, for no one has ever been able to show any morphological differences between the Eurasian and North American populations.

Dr. Creighton has also raised the common eastern *pennsylvanicus* to separate specific status, and I think his evidence for this move is strong enough to deserve the support of all workers. Furthermore, a number of variants that have managed to persist in the literature are exposed as synonyms, mostly based on insufficient or poorly preserved material. In this one publication, Dr. Creighton has presented ant taxonomy, in *Camponotus* and other groups, with the most prodigious act of unscrambling that has yet been performed on this or any other continent. His work will undoubtedly form the bedrock systematics for all future work on Nearctic ants, and changes to be made during the "morphological" period of our labors will be largely in the nature of retouches of this single contribution.

To the present author, two of the most important, yet still relatively minor, corrections that should be made lie with the forms Creighton has called *Camponotus pennsylvanicus modoc*

Wheeler and *C. pennsylvanicus ferrugineus* (Fabricius). I am convinced that neither form can be placed as a subspecies of *pennsylvanicus*.

Camponotus herculeanus modoc Wheeler

In my opinion, *modoc* is much more logically treated as a southern race of *herculeanus* than as a western race of *pennsylvanicus*. *Modoc* ranges widely in the mountains of the western United States and in subboreal regions of the Pacific Northwest, and its northern limits roughly meet the southern low altitude limits of *herculeanus herculeanus* in a broad belt near the Canadian Border. Specimens stemming from this broad region seem to intergrade between the two subspecies, although the material I have seen could certainly stand supplementation through further collections. *Modoc* can be distinguished from the northern and alpine form in that the reddish color of the propodeum and petiole has been replaced by black, so that *modoc* is concolorous black except for the legs. Also, the gastric pubescence of *modoc* tends to be a little longer, often surpassing the posterior borders of the gastric segments in the middle. These relatively pubescent specimens were thought by Wheeler to represent intergrades between *modoc* and *pennsylvanicus*, and it is possible that Dr. Creighton is following this line of thought. A reexamination of *modoc*, *pennsylvanicus*, and *h. herculeanus* specimens, common in most collections in this country, should convince most workers that the interpretation given here has the better chance of being correct.

Camponotus ferrugineus (Fabricius)

This form is completely blanketed distributionally by the range of *pennsylvanicus*. Morphologically, it differs from *pennsylvanicus* (so far as anyone has been able to tell) only in color. This color difference, however, is quite striking, and there are no recorded instances of difficulty in distinguishing *ferrugineus* in the field. Dr. Creighton's treatment of this ant is extraordinary in that he has allowed it to remain as a subspecies of *pennsylvanicus* in spite of the complete and exceed-

ingly detailed sympatry shown by the two forms. His aberrant procedure has, I believe, been forced by the conflict of his belief in sympatry and lack of intergrades as reliable specific criteria on the one hand, and his profound distrust of color as the same sort of criterion on the other.

By his own taxonomic principles, Dr. Creighton will eventually have to resolve this dilemma for himself. Meanwhile, I feel confident in proposing that *ferrugineus* be raised to separate specific rank. The prospect of considering the striking color difference as the sole morphological point of differentiation so far discovered does not disturb me in the least, even though I realize that other species of the same group (in Europe and Asia) are extremely variable in coloration. The major taxonomic fact supporting this view, and one recognized by Dr. Creighton, is the lack of known intergradient color forms connecting the two species. This fact has been noted by several authors, and it appears to hold true even in areas where nests of the two forms may be only a few feet apart. The flight time of the sexual phases frequently coincides to the day, at least in Pennsylvania and eastern Massachusetts, so that ample opportunity is probably presented for interbreeding.

To allow, therefore, for the possibility of the conspecificity of the two forms, one would have to postulate that the genetic factor or factors controlling color would operate on an "all-or-none" basis in this case. Furthermore, the random association of queens of mixed origins should certainly result in mixed pleometrotic nests if such an "all-or-none" theory is to be accepted. No mixed nests are known in nature.

There is a biological difference that will aid in separating the two as species. In areas where they occur together, *pennsylvanicus* is usually the more common species. While it will accept a rather wide range of nest sites, *pennsylvanicus* (in the area of sympatry) as found in relatively undisturbed forest areas nearly always nests in standing timber. This standing timber may be partially rotten or largely sound. Dr. Creighton's belief that the tunnels of this ant are driven only into decaying parts of the sound timbers or standing trees is certainly incorrect, as

has been shown abundantly in the literature both for *pennsylvanicus* (cf. Townsend, 1945, for bibliography) and for *herculeanus herculeanus* (cf. Eidmann, 1928). Dr. R. B. Friend, Connecticut State Entomologist and one who has extensively investigated ant damage to telephone poles in his state, assures me that *pennsylvanicus* can and will tunnel extensively in sound poles there. I myself have watched for long periods at a living sycamore tree housing a colony of *pennsylvanicus* at Philadelphia. The sawdust brought out and dropped to the base of the tree by the ants was large in amount, and in periods of great tunnelling activity was creamy white in color, the shade of new sawdust fresh from the saw. It seems probable that the original entrance to the interior of the tree is often or always forced through a decayed or otherwise damaged place, however, and it is true that *pennsylvanicus* will also nest in wholly or partially decayed wood. Nests of *pennsylvanicus* (in the sympatric zone) are rarely made in "red-rotten" logs or stumps, and the soil itself is rarely penetrated by the galleries.

In these respects, *ferrugineus* differs sharply, for its nests are almost invariably in or beneath rotten logs at the punky "red" stage. The galleries, in all of the many nests I have seen, penetrate the soil beneath the log or stump to considerable depths. Often the major population of the nest will be found in the subterranean chambers, and if the log be removed, the colony will often stay on living underground at the same spot. Anyone who cares to survey the biological statements concerning *ferrugineus* in the various state lists and similar sources will find that this ant behaves in an essentially similar fashion throughout its range. Perhaps the coloration is an adaptation to nesting in this reddish environment, and the same is possibly true of *C. noveboracensis* (Fitch), a more boreal species also commonly found in red-rotten logs and stumps.

The combined color differences and ethological peculiarities, and also the distributional considerations, leave little alternative to considering *ferrugineus* as a good and separate species.

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Orasema in Nests of *Pheidole dentata* Mayr (Hymenoptera: Formicidae)

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Within the past few years, two instances of parasitism were found within the nests of *Pheidole dentata* Mayr. In one case the parasites were determined by Mr. A. B. Gahan of the United States National Museum as the chalcid *Orasema robertsoni* Gahan, and in the other case Mr. Gahan determined the parasites as *Orasema* sp., possibly *robertsoni* Gahan. In the latter case insufficient material was available for specific determination.

The first parasitized colony was collected in the Welaka Reserve of northeastern peninsular Florida on September 19, 1949. This nest was in a hardwood stump in mesic hammock (*Magnolia grandiflora*—*Ilex opaca* association). The number of ants within the nest was 174, including 12 soldiers. Unparasitized pupae and larvae were present, along with an almost equal number of parasitized immatures.

Many different sizes of *Orasema* larvae were found, ranging from small insignificant points on the ant pupae or larvae, through a characteristic striped stage, to the late stage larvae with vesiculate knobs on its lateral borders. All were attached to the anterior portion of a *Pheidole* larva or pupa (fig. 1, A).

¹ Contribution of the Department of Biology, University of Florida, Gainesville.