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(HYMENOPTERA: FORMICIDAE)

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Prior to the work of Creighton (1950) the genus *Camponotus* Mayr had assigned to it approximately 60 names for various components of the Nearctic fauna. Creighton attacked the problems posed by this superabundance of names and reduced them to 48. Since then little has been done: three new species have been described (Creighton, 1952, 1965; Smith, 1953), two have been redescribed (Creighton, 1965; Creighton and Snelling, 1966), one has been excluded from the Nearctic fauna (Creighton, 1952) and one subspecies has been transferred from one species to another and back again (Brown, 1950; Gregg, 1963). While studying the ants of California and Baja California, Mexico, I became convinced that still further changes are in order. Two of the necessary changes affecting the species of California are proposed here.

A large part of the material on which this study is based is in the collections of the Los Angeles County Museum of Natural History. An important collection from Baja California has been made available through the courtesy of E. L. Sleeper and E. M. Fisher, Long Beach State College, Long Beach, California. Other material, including important type specimens, was studied at the United States National Museum through the kindness of D. R. Smith. In several conversations I have had the benefit of the extensive experience of W. S. Creighton and M. R. Smith has made available for reference an unfinished manuscript revision of the subgenus *Myrmentoma* Forel. To each of these gentlemen my very sincere thanks for their cooperation. The figures for this paper were prepared by Ruth A. DeNicola to whom I remain grateful.

***Camponotus* (*Tanaemyrmex*) *festinatus* (Buckley), new status**

Formica festinata Buckley, 1866, Proc. Ent. Soc. Phila. 6:164. ♂ ♀.

Camponotus (*Camponotus*) *fumidus pubicornis* Emery, 1894, Zool. Jahrb., Abt. f. System. 7:668, 670. ♂.

- Camponotus fragilis* Pergande, 1894, Proc. Calif. Acad. Sci. 4:26. ♀.
Camponotus fumidus var. *festinatus*: Wheeler, 1902, Trans. Texas Acad. Sci. 4:22.
 ♂. Wheeler, 1910, Ann. N. Y. Acad. Sci. 20:312-314.
Camponotus fumidus var. *fragilis*: Emery, 1895, Zool. Jahrb., Abt. f. System. 8:336.
 ♀. Wheeler, 1910, Ann. N. Y. Acad. Sci. 20: 315. ♀.
Camponotus fumidus var. *spurcus* Wheeler, 1910, Ann. N. Y. Acad. Sci. 20:315.
 ♀♀.
Camponotus fumidus subsp. *festinatus*: Creighton, 1950, Bull. Mus. Comp. Zool. 104:376.

Although this ant has traditionally been considered a form of *C. fumidus* Roger I have departed from this treatment. Roger (1863) described his species from a major worker from an unspecified locality in Venezuela. While the original description is not completely adequate by current standards, one significant characteristic was described; Roger stated quite clearly that the scapes and tibiae of *C. fumidus* were without erect hairs ("... fehlt am Scapus und an den Schienen."). Since a number of so-called subspecies have been assigned to *C. fumidus* which possess abundant erect hairs on the scapes and tibiae I have examined them and find that they differ specifically from one another and therefore, presumably, from *C. fumidus* as well.

I have not seen true *C. fumidus*; the few specimens available to me under this name do not agree with the original description and I see no reason to consider them the same as Roger's ant. All material which I have seen from Mexico and the United States has been assigned to *C. festinatus*. While there is a considerable amount of variation in these samples, they consistently possess erect hairs on the scapes and tibiae.

Of the several forms currently assigned to *C. fumidus*, *C. f. pubicornis*, *C. fragilis* and *C. f. spurca* may be disregarded as outright synonyms of *C. festinatus*, as shown by Creighton (1950). Two West Indian forms, *C. f. vittata* Forel and *C. f. lucayana* Wheeler, are deserving of consideration, since they bear somewhat on the status of our mainland form. Of *C. f. vittata* I have seen a few workers and majors and a single female from Brazil and a long series of workers and majors from the island of Dominica. Of *C. f. lucayana* I have seen several series, including all castes, from the Bimini Islands. These, together with *C. festinatus*, form a distinct group but each apparently should stand as a separate species.

All agree in possessing erect hairs on the scapes and tibiae as well as on the cheeks. Although there is conspicuous variation in the color of these ants they offer an undeniable basic similarity. Basically the integument is pale yellow but it tends to be overlain by a distinct brownish infuscation, especially on the occipital region, the thoracic dorsum and on the gaster. In its greatest development (most material

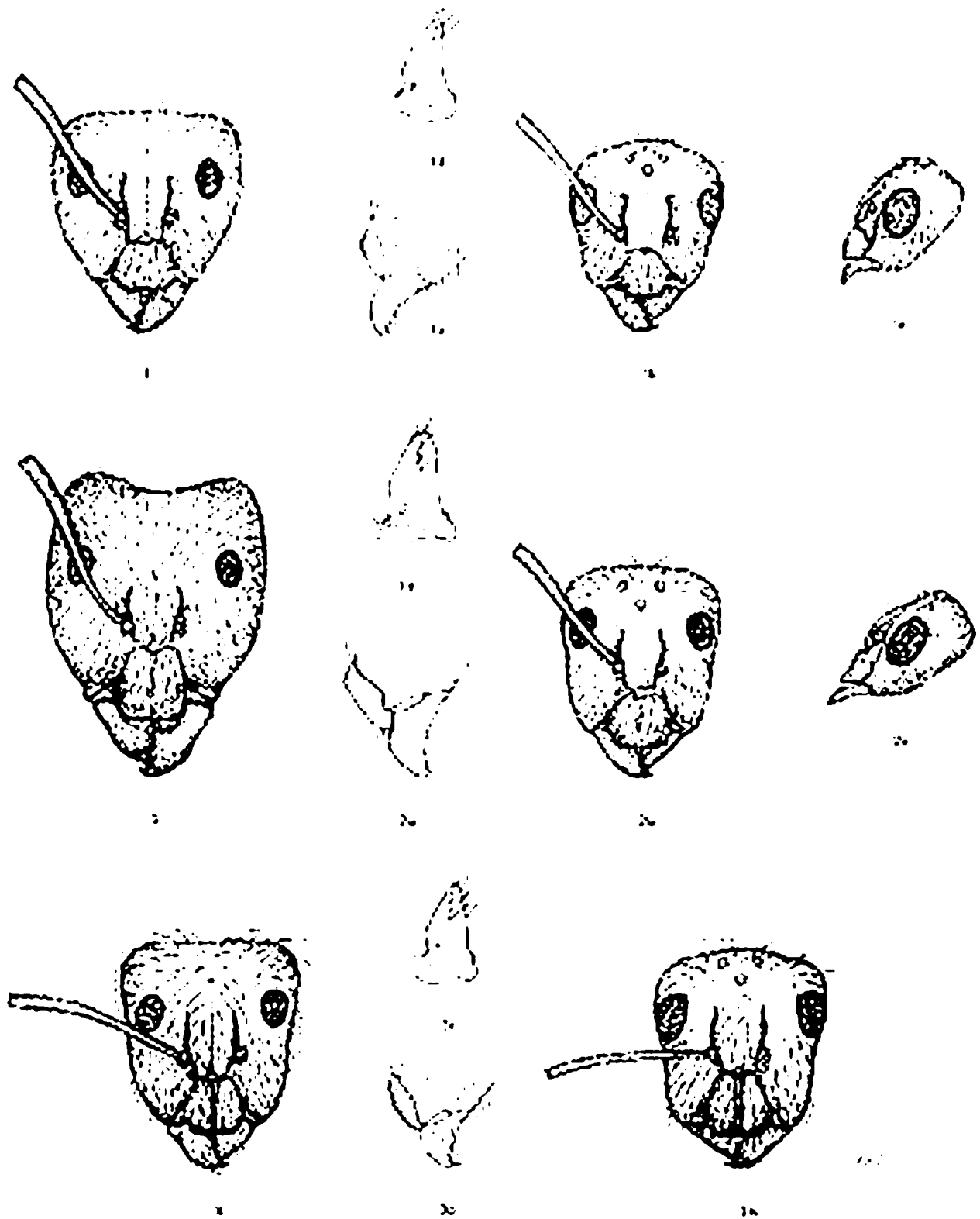


Fig. 1, *Camponotus festinatus* (Buckley), major worker, head, frontal view: 1a, major worker, lower half of head, lateral view; 1b, female, head, frontal view; 1c, male, head, lateral view; 1d, female, petiolar scale, lateral view. Fig. 2, *Camponotus lucayanus* Wheeler, same. Fig. 3, *Camponotus vittatus* Forel, a, b, same; 3c, female, petiolar scale, lateral view.

of *C. vittatus*) the yellow is almost completely obscured except for lateral spots on the gastric segments. The same pattern is present, too, in infuscated individuals of *C. lucayanus* and *C. festinatus* but not as well developed though occasional specimens show lateral spots.

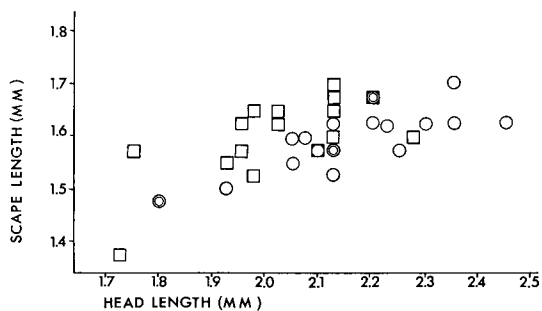
All three species have the apico-median portion of the clypeus slightly prolonged, with its margin transverse. A median longitudinal carina is present, but the extent of its development varies from one species to the next. In *C. vittatus* (fig. 3a) the carina is high and sharp and extends the entire length of the clypeus in the workers and females. In *C. lucayanus* (fig. 2a) and *C. festinatus* (fig. 1a) the carina is much lower and rounded; indeed, it is hardly more than a median angulation of the clypeal disc. In these species, also, the carina extends only about two-thirds the length of the clypeus. In profile, the carina in *C. lucayanus* is relatively flat in the apical three-fourths and slopes abruptly in the basal one-fourth to the basal clypeal suture. By contrast, that of *C. festinatus* presents a low contour which is evenly rounded; rarely is it slightly angled at the basal one-fourth.

The above considerations apply to the workers, both major and minor, and to the females. Males of *C. vittatus* have not been available, but I have seen numerous males of *C. lucayanus* and *C. festinatus*. The profile of the clypeus is dramatically different. In *C. lucayanus* (fig. 2c) the clypeus is either flat or with an angular transverse impression in the middle; the basal one-fifth falls steeply, sometimes vertically, to the basal suture. No such condition exists in *C. festinatus* males. In these the clypeal profile may be slightly convex, a little more rounded toward the base, or with a transverse median impression. But, in all specimens seen by me, the basal portion is evenly rounded toward the basal suture (fig. 1b).

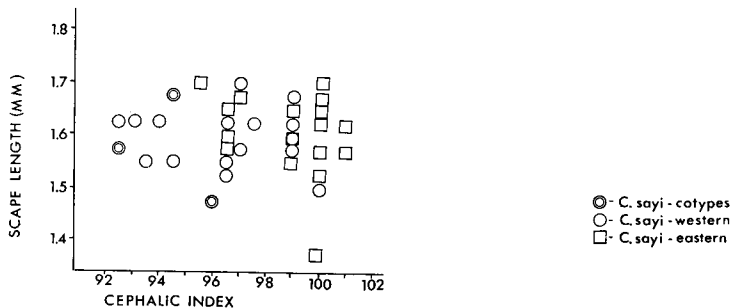
The major workers of *C. lucayanus* have a slightly shorter scape than do those of the other species, exceeding the occipital corners by about the length of the first funicular segment. In *C. festinatus* and *C. vittatus* the scapes extend beyond the occipital corners by a distance nearly equal to the combined lengths of the first two funicular segments.

The shape of the head, in full face view, differs among the three species. In *C. vittatus* the head of the majors is relatively longer and the convergence of the lateral margins below is more pronounced (fig. 3). In the minor workers of *C. festinatus* and *C. lucayanus* the margins of the head, below the level of the eyes, are parallel or slightly narrowed toward the mandibular insertions, while in *C. vittatus* the sides of the head are divergent below; i.e., the head is a little broader at the level of the mandibular insertions than at the level of the lower margins of the eyes.

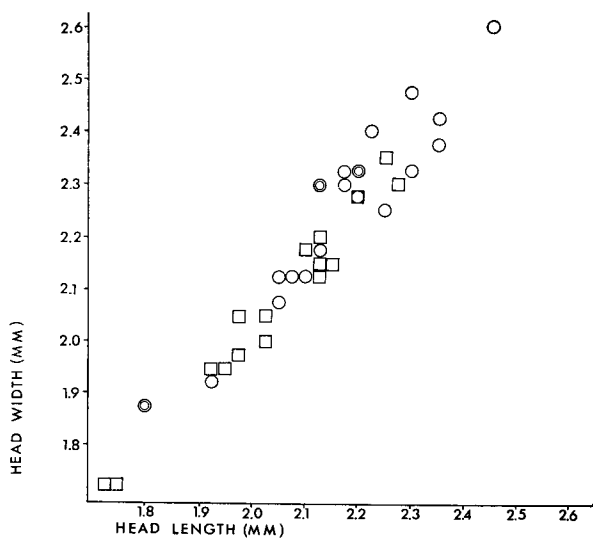
The shape of the head of the females differs but the differences are slight. That of *C. vittatus* (fig. 3b) is distinctly sinuate in full face view, the face being narrowed slightly below the level of the eyes. This, however, is based upon a single specimen and I believe it may not prove consistent, since I have seen a few females of *C. festinatus* with



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an indication of a similar narrowing. The head is longest and narrowest in *C. vittatus*, shortest and broadest in *C. festinatus*.

The erect cephalic hairs differ and in this, also, *C. vittatus* is most distinctive. In both *C. festinatus* and *C. lucayanus* the longest hairs are shorter than the maximum diameter of the eyes, while in *C. vittatus* these hairs are distinctly longer. The latter species also has a greater number of erect hairs as indicated in the figures.

Finally, the shape of the petiolar scale differs. In *C. lucayanus* and *C. festinatus* the scale is variable in profile, but it is usually blunt above, with the summit rather evenly rounded (figs. 1d, 2d). The scale of *C. vittatus* (fig. 3c) is distinctly cuneate in profile, the apex strongly narrowed and angular.

There is no evidence that these forms are sympatric with one another and hence there is no opportunity for the intergrades one would expect if they were subspecies of a single polytypic species. This, of course, does not rule out the possibility that they may actually be subspecies, but I am convinced that the morphological evidence is against such an interpretation. That any of these could be subspecies of *C. fumidus*, which lacks the erect hairs so conspicuous on the scapes and tibiae of the other three, I seriously doubt. The southernmost of the three species, *C. vittatus*, is typically the most hirsute; specimens of *C. festinatus* from the southern parts of its range exhibit an increase in the density of erect hairs present. This seems to be precisely the opposite of what should be expected if this ant is, in fact, a subspecies of the Venezuelan *C. fumidus*. It seems more reasonable to accord this ant specific status until conclusive evidence to the contrary is forthcoming.

Camponotus (Myrmentoma) sayi Emery

Camponotus sayi Emery, 1894, Zool. Jahrb., Abt. f. System. 7:679. ♀. Wheeler, 1910, Ann. N. Y. Acad. Sci. 20:343. ♀.

Camponotus sayi var. *bicolor* Pergande, 1894, Proc. Calif. Acad. Sci. 4:161. ♀ ♀ ♂. Preocc.

Camponotus fallax subsp. *rasilis* Wheeler, 1910, Jour. N. Y. Ent. Soc. 18:227. ♀ ♀ ♂. **New synonym.**

Camponotus sayi californica Emery, 1925, in Wytzman, Gen. Insect. 183:118. New name for *C. sayi bicolor* Pergande. **New synonym.**

Camponotus (Myrmentoma) rasilis: Creighton, 1950, Bull. Mus. Comp. Zool. 104:389. Gregg, 1963. Univ. Colo. Press, Boulder, pp. 677-678.

Camponotus (Myrmentoma) sayi: Creighton, 1950, Bull. Mus. Comp. Zool. 104:390.

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Fig. 4. Head length-scape length relationships in *Camponotus sayi* Emery major workers. Fig. 5. Cephalic index-scape length relationships in *C. sayi*. Fig. 6. Head length-head width relationships in populations of *C. sayi* major workers.

Camponotus sayi was described by Emery from a limited series of specimens taken at Phoenix, Arizona. These ants were sent to him by Pergande who, typically, retained a portion for his own collection. Six specimens of this series (three major and three minor workers), marked as cotypes, are in the collections of the United States National Museum. These specimens, plus the cotypes of *C. sayi bicolor*, are the basis for the discussion which follows.

Emery's original description, while brief, is straightforward and contains sufficient information to permit recognition of the species. At this time the ant was compared to *C. marginatus discolor* (i.e., *C. caryae discolor*), but was noted to differ in the lack of foveiform punctures on the cheeks. Pergande described *C. sayi bicolor* from a long series of workers, two females and three males from Chuparosa in the Sierra Laguna and San Jose del Cabo, Baja California, Mexico. The name chosen by Pergande was preoccupied and Emery renamed it *C. sayi californicus* in 1925. Pergande characterized his ant as being distinctly larger than *C. sayi* from Arizona (of which he had part of the original series) but I do not think this is important since size is a notoriously poor character in this genus.

Wheeler (1910a) described *C. fallax rasilis* from material taken in Texas, Arizona, Louisiana and Florida. The original description was so vague that any small *Camponotus* with reddish head and thorax and nonpilose cheeks could be assigned to it. The key provided by Wheeler was no better since separation of the various forms depended on color and "average size." In the same year Wheeler published a second paper (1910b) on *Camponotus*. Here, *C. fallax rasilis* was merely listed, while *C. sayi* was redescribed, evidently from a few cotypes and a few strays taken by Wheeler at Phoenix (the type locality of *C. sayi*) and at Prescott, Arizona. Wheeler's redescription of *C. sayi* was reasonably detailed, but in the case of the major workers, it was evidently based upon maximum-sized individuals representing the ideal condition. Further commentary was provided: "This species, as Emery has remarked, is very similar to *C. fallax discolor*. It is even more like *fallax rasilis*, but the head and thorax are more robust, the head is more excised behind, the clypeal notch is smaller, the epinotum more angular and the sculpture is different, the punctures on the sides and front of the head being much smaller and the surface of the head and thorax somewhat more shining. These differences are not very pronounced and it may be necessary, when *sayi* is better known, to reduce it to the rank of a subspecies of *fallax*." Another key was given; this key included *C. sayi*, not included in the earlier paper. Here, *C. sayi* was separated from *C. fallax* forms by its larger, broader head and the non-pubescent gaster.

Creighton (1950) used a different method for separating *C. sayi* from *C. rasilis* (elevated there to specific rank). He utilized the

relatively shorter scape of *C. sayi*, said to fall short of the occipital corners. In *C. rasilis* the scape was said to extend beyond the occipital corners by at least the apical breadth of the scape.

Since one of the cotype majors of *C. sayi* has the scape extending beyond the occipital corners, a character seen also in some cotypes of *C. sayi bicolor*, it seemed prudent to investigate this character in detail. All available cotype majors of *C. sayi* and *C. sayi bicolor* were measured for head length and scape length. Similar measurements were made on randomly selected majors of *C. rasilis* from Mississippi, Georgia, Texas and Oklahoma. The results are shown in fig. 4. It is evident that a poorly defined regression zone exists and that there is a tendency for the eastern populations to exhibit a relatively longer scape. However, it is equally obvious that there is a broad overlap in scape length. Interestingly, the cotypes of *C. sayi* fall very clearly in the median area. Since these data suggest at least a partial differentiation I next attempted to correlate scape length with the cephalic index ($HL \div HW \times 100$), the results of which are shown in fig. 5. Finally, the relationship of head length to head width is shown in fig. 6. These data confirm those indicated in fig. 4, that differentiation does exist but that it is neither significant nor consistent. On the basis of cephalic characters, it is clear that neither *C. sayi bicolor* = *californicus* nor *C. rasilis* is worthy of separation.

I believe that all the differences cited to separate these forms are the results of allometry; relative scape length decreases, cephalic punctures become finer and sparser, the occipital excision becomes more pronounced, integument becomes shinier, angles become more exaggerated, with the increase in size. The only difference left is that of the supposedly non-pubescent gaster of *C. sayi* versus the condition of *C. rasilis* in which there are evident scattered fine appressed hairs. These hairs are present in *C. sayi*, but least evident in the largest specimens. This is due, I think, not to a reduction in the number of such hairs, but rather to the more shining integument of these individuals. These hairs are obvious in *C. rasilis* and small specimens of *C. sayi* because they reflect light and hence are more apparent against the duller integument. But, in the case of specimens with a nearly polished integument, the entire surface is highly reflective and these fine, appressed hairs are merely more difficult to perceive.

Because the differences which purportedly separate *C. sayi* from *C. rasilis* are correlated with allometric growth I see nothing to be gained by the continued separation of these insects. It should be further clear that, while the eastern and western populations tend to exhibit some differences, these are slight and of little practical value. The populations from Texas eastward appear to be more constant in their characters and the maximum head length of the majors is a little less than is true of the western populations (fig. 4). Coupled

with this smaller size is a relatively longer antennal scape and a slightly duller integument (especially on the head). The western populations are highly plastic (perhaps in response to greater variation in habitats and climate) and individuals within a single colony sample may possess either a long or short scape, or one of intermediate length.

REFERENCES

- Brown, W. L., Jr.** 1950. The status of two common North American carpenter ants. *Ent. News* 61:157-161.
- Creighton, W. S.** 1950. The ants of North America. *Bull. Mus. Comp. Zool.* 104:1-585.
- . 1952. Studies on Arizona ants (4). *Camponotus (Colobopsis) papago*, a new species from southern Arizona. *Psyche* 59:148-162.
- . 1965. Studies on southwestern ants belonging to *Camponotus*, subgenus *Myrmobrachys*. *Amer. Mus. Novit.* 2239:1-9.
- and **R. R. Snelling.** 1966. The rediscovery of *Camponotus yogi* Wheeler. *Psyche* 73:187-195.
- Gregg, R. E.** 1963. The ants of Colorado. Univ. Colo. Press, Denver, xvi + 792 pp.
- Roger, J.** 1863. Die neu aufgeführten Gattungen und Arten meins Formiciden-Verzeichnisses. *Berlin Ent. Zeit.* 7:131-214.
- Smith, M. R.** 1953. A new *Camponotus* in California apparently inhabiting live oak, *Quercus* sp. *Jour. N. Y. Ent. Soc.* 61:211-214.
- Wheeler, W. M.** 1910a. The North American forms of *Camponotus fallax* Nylander. *Jour. N. Y. Ent. Soc.* 18:216-232.
- . 1910b. The North American ants of the genus *Camponotus* Mayr. *Ann. N. Y. Acad. Sci.* 20:295-354.