

Number 309
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CONTRIBUTIONS IN SCIENCE

NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

NOTES FOR A REVISION OF THE ANT GENUS *FORMICA*.
2. REIDENTIFICATIONS FOR SOME SPECIMENS FROM THE T. W. COOK
COLLECTION AND NEW DISTRIBUTION DATA
(HYMENOPTERA: FORMICIDAE).

By André Francoeur and Roy R. Snelling



SERIAL PUBLICATIONS OF THE
NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Prior to November 30, 1973, publications of the Natural History Museum have appeared under various titles — *Leaflet Series*, *Museum Graphic*, *Education Series*, *History Series*, *Science Series*, *Study Guides*, *Contributions in History*, *History Bulletin*, *Science Bulletin*, unnumbered catalogs of exhibitions, and other miscellaneous publications.

The publication program of the Natural History Museum continues to publish a series of reports that give accounts of new discoveries in history and science as well as new advances in museum knowledge. The theme of the Natural History Museum serials will emphasize basic research through the continuing active series:

Contributions in Science
Education Series
History Series
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In these series, the *Contributions in Science* are comprehensive papers of imperial octavo size whereas the Series are papers of variable lengths of quarto or larger size. Issues in each series are numbered separately and consecutively, and report on the research and collections of the Natural History Museum, or of research activity of professional colleagues. The Museum's publications are distributed through mailing lists to libraries, universities, and similar institutions throughout the world.

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All communications concerning submission of manuscripts should be directed to the Editor, Museum Publications; all communications concerning exchange of publications should be sent to the Research Library; all communications concerning purchase of publications should be sent to the Book Shop, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007.

Edward Ostermeyer
Editor

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The *Science Bulletin* and *Contributions in Science* of the Natural History Museum of Los Angeles County were merged into a single imperial octavo serial, retaining the name *Contributions in Science* and beginning with Number 301.

This serial has been newly formatted for maximum use of typography and illustrations per page, and sized for maximum use of paper. All photography has been produced utilizing a 200-line screen for detail.

Since most institutions rebind *Contributions in Science* collectively into hardbound volumes, and many researchers using them desire to photocopy material, two new features have been incorporated into the new format. A suggested citation line provides the abbreviated serial title, year, number of publication, and total pagination, and appears in the lower left corner of each page; and pages of *Contributions in Science* have been printed off-center to provide a two-inch gutter between adjacent pages for easier accessibility in photocopying.

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Contributions in Science are articles in the earth and life sciences, presenting results of original research in Natural History. *Science Bulletin* (Numbers 1-30; 28 June 1965 to 10 April 1978) and *Contributions in Science* (Numbers 1-300; 23 January 1957 to 16 June 1978) were merged into a single imperial octavo serial beginning with Number 301.

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By André Francoeur²
 and Roy R. Snelling³

ABSTRACT: Specimens of the *Formica neogagates* and *Formica fusca* groups from the T.W. Cook collection are reidentified. New morphological variations are presented for *F. longipilosa*, together with a first description of the male. Some of these data extend the geographical distribution of the less well known species particularly in California.

"The Ants of California" was privately published by Thomas Wrentmore Cook in 1953. This was Cook's only published work on ants and it does no credit to a many-faceted man. The book consists, for the most part, of records and descriptive and biological notes gleaned from previously published work of other authors. These applied, for the most part, to California forms, but no effort was made to correct records based on misidentified specimens. The present paper reveals so many surprising misidentifications and misinterpretations in *Formica* species or species groups, that it becomes impossible to use any data from "The Ants of California" without having the specimens at hand.

Furthermore, the drawings illustrating the book are misleading or inaccurate: the head of *Formica subnuda* (p. 368) and the mesosoma of *F. occidua* (p. 385) are erroneously proportioned; the "female" head of *F. subsericea* (p. 368) is that of a male; the maxillary palpi of *F. sibylla* (p. 392) are too short; the figure of *F. subpolita camponoticeps* (p. 392) is a worker of *F. neorufibarbis*.

Numerous other deficiencies are pointed out by Brown and Wilson (1953).

Cook died in 1962. In 1964 his collection was donated to the Oakland Museum by his widow. The ants were transferred to the Natural History Museum of Los Angeles County in 1971. There were 4,397 pinned ant specimens and an undetermined number in 213 vials (Arnaud and Wale 1973). Almost half of the pinned material consisted of specimens from W. M. Wheeler's collection acquired during a brief stay at Harvard. Most of the remainder were specimens from the collections of Stanford University, still bearing the distinctive "L.S. Jr. U." labels. The Stanford University specimens were collected mostly by W.M. Mann. The specimens in vials were, in large part, collected by Cook. Judging by the number of specimens clearly collected by Cook and by the localities visited, he had a very limited first hand acquaintance with the ants of California.

The present note attempts first of all to clarify some of the erroneous citations in "The Ants of California." We also cite new distributional and morphological data, particularly on several

species in the *F. fusca* group described recently by the senior author (Francoeur 1973). A few specimens, cited as various forms of *Formica*, belong to other genera and are noted at the end of this paper.

The following abbreviations are used: LSJU (Leland Stanford Jr. University); TWC (T.W. Cook); WMM (W.M. Mann); WMW (W.M. Wheeler).

FORMICA NEOGAGATES GROUP
 NEOGAGATES COMPLEX
Formica lasioides Emery

Formica neogagates lasioides: Cook, 1953, p. 360

Formica neogagates lasioides var. *vetula*: id. p. 361

Formica fusca fusca: id. (in part), p. 371

Formica subpolita var. *camponoticeps*: id. (in part), p. 397

Labelled *neogagates lasioides* var. *vetula*: 3 ♀ from Pacific Grove (WMM), 3 ♀ from Lake Tahoe, 4 ♀ from Quincy (TWC), CALIF.

Labelled *fusca*: 1 ♀, 3 ♀ from Lake Tahoe, CALIF.

Labelled *subpolita camponoticeps*: 1 ♀, 5 ♀ from Glacier Point, Yosemite, CALIF.

Unidentified: 4 ♀ from Eagle Creek (LSJU), 1 ♀ from Oswego (Duncan), 2 ♀ from Rowena (LSJU), ORE.; 6 ♀ from Big Lagoon, Humboldt Co., 5 ♀ from Lake Tahoe, 9 ♀ from Mirror Lake, elev. 4096 ft., CALIF.

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Formica neogagates Emery

Unidentified: 5 ♀ from Ithaca, N. Y.; 13 ♀ from Pullman, WASH. (WMM).

OBTUSIPILOSA COMPLEX

Formica perpilosa Wheeler

Labelled *Formica*: 4 ♀ from Santa Clara Co., CALIF. The label is the same as on other specimens from the Stanford University collection and they are surely from that collection.

FORMICA FUSCA GROUP

CINEREA COMPLEX

Formica canadensis Santschi

Labelled *fusca* var. *argentea*: 1 ♀ from Colorado Springs, COLO. (E.S. Tucker).

Formica pilicornis Emery

Formica cinerea var. *lepida*: Cook (in part), 1953, p. 373

Formica pilicornis: id. (in part), p. 385

Labelled *pilicornis*: 9 ♀ from South San Francisco and 18 ♀ from San Francisco, CALIF. (TWC).

Labelled *cinerea* var. *lepida*: 16 ♀ from Saugus, CALIF.

Unidentified: 6 ♀ from Tejon Pass, CALIF. (TWC).

NEOCLARA COMPLEX

Formica neoclara Emery

Formica cinerea var. *neocinerea*: Cook (in part), 1953, p. 374.

Labelled *fusca* var. between *neoclara* and *argentata*: 3 ♀ from Pullman, WASH. (LSJU).

Labelled *fusca* var. *neoclara*: 4 ♀ from Colorado Springs, COLO. (E.S. Tucker).

Labelled *fusca* var.: 5 ♀ from Sisson, CALIF. (J.C. Bradley).

SUBPOLITA COMPLEX

Formica subpolita Mayr

Formica subpolita: Cook, 1953, p. 396.

Formica subpolita var. *camponoticeps*: id. (in part), p. 397.

Formica fusca var. *marcida*: id. (in part), p. 379.

Formica fusca var. *neorufibarbis*: id. (in part), p. 380.

Labelled *subpolita*: 8 ♀ from Pacific Grove (WMM), 8 ♀ from Corte Madera Creek, 27 ♀ from Greenville, CALIF.

Labelled *subpolita* var. *camponoticeps*: 3 ♀ from Yosemite, 6 ♀ from Yosemite Falls Top, 3 ♀ from Yosemite Village, 1 ♀, 3 ♀ from Old Village, Yosemite Valley, 15 ♀ from Glacier Point, Yosemite, 2 ♀ from Mt. Tamalpais, CALIF.

Labelled *fusca* var. *marcida*: 5 ♀ from Point Joe, near Pacific Grove, CALIF.

Labelled *fusca* var. *neorufibarbis*: 1 ♀ from top of Mount Wilson, CALIF. (J.C. Bradley) together with 1 ♀ of *Liometopum* sp.

LEPIDA COMPLEX

Formica aerata Francoeur

Formica cinerea var. *neocinerea*: Cook, (in part), 1953, p. 374.

Labelled *cinerea* var. *neocinerea*: 3 ♀ from Three Rivers (J.C. Bradley), 3 ♀ from Sacramento (H.S. Smith), 1 ♀ from Stanford University, CALIF. (LSJU).

Labelled *Formica*: 3 ♀ from Stanford Univ., CALIF.

Unidentified: 1 ♀ from Santa Clara Co., CALIF. (Harkins); 3 ♀

from 3.5 mi. south of Kirby, ORE.

Formica lepida Wheeler

Unidentified: 1 ♀ from Smith River Camp, Del Norte Co., CALIF. This is the second record for this species.

Formica longipilosa Francoeur

Figures 1-3

Unidentified: 20 ♀ and 2 ♂ from Ukiah, CALIF. (LSJU). These specimens are the second series known to us. They provide new data on the morphology of the workers. The male is described here for the first time.

WORKER: The series fits the original description (Francoeur 1973, p. 126-127). However, the size averages somewhat smaller: head width 0.96-1.14 mm; head length 1.09-1.31; eye diameter 0.41-0.47; scape length 1.07-1.27; trunk length 1.59-1.84. The dorsal margin of petiole less convex, in one case feebly and narrowly excised.

MALE: First description based on two androtypes (in LACM and senior author's collection). General morphology similar to *F. transmontanis* Francoeur, but averaging smaller. Measurements in mm: head width 1.61-1.35; eye diameter 0.70-0.71; trunk length 3.05-3.20; pronotum width 1.56-1.65. Head distinctly broader than long, occipital margin slightly convex, ocelli small (0.12-0.14 mm); clypeus bulging, faintly carinated, anterior margin convex; mandible rather narrow with only an apical tooth. Petiole low and thick in profile, dorsal margin with large, weak concavity and rounded corners. Genitalia: posterior half of parameres more acute and larger, with long hairs; subgenital plate shining, when ventral surface is seen from above, posterior end not produced as in *transmontanis*, rather straight, with two concavities separated medially by rounded process. Body concolorous brown, antennae paler, legs yellowish brown; most parts with dense and long pubescence, particularly on anterior dorsal half of head, pronotum, petiole and gaster; pilosity distributed as in *transmontanis* but longer and finer especially on head and thorax.

Formica pacifica Francoeur

Unidentified: 5 ♀ from Cannon Beach (LSJU), 3 ♀ from Goble (LSJU), 1 alated ♀ from Umpqua River, Canyonville, ORE.

SUBSERICEA COMPLEX

Formica argentea Wheeler

Formica sibylla: Cook (in part), 1953, p. 393.

Labelled *fusca* var. *argentata* or var. *argentea*: 8 ♀ from Pullman, WASH. (WMM).

Labelled *fusca* var.: 2 ♀ 2 ♂, & 1 ♀ from San Juan Island, WASH. (WMM).

Labelled *sibylla*: 3 ♀ from Lake Tahoe, CALIF.

Unidentified: 1 ♀ from Boyd, 2 ♀ from Linsley, 1 ♀ from Rowena (LSJU), 7 ♀ from Tygh Valley (LSJU), ORE.; 1 ♀ from Hewlett Point, 1 ♀ from Prescott (L.R. Dice), WASH.

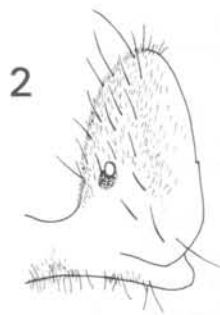
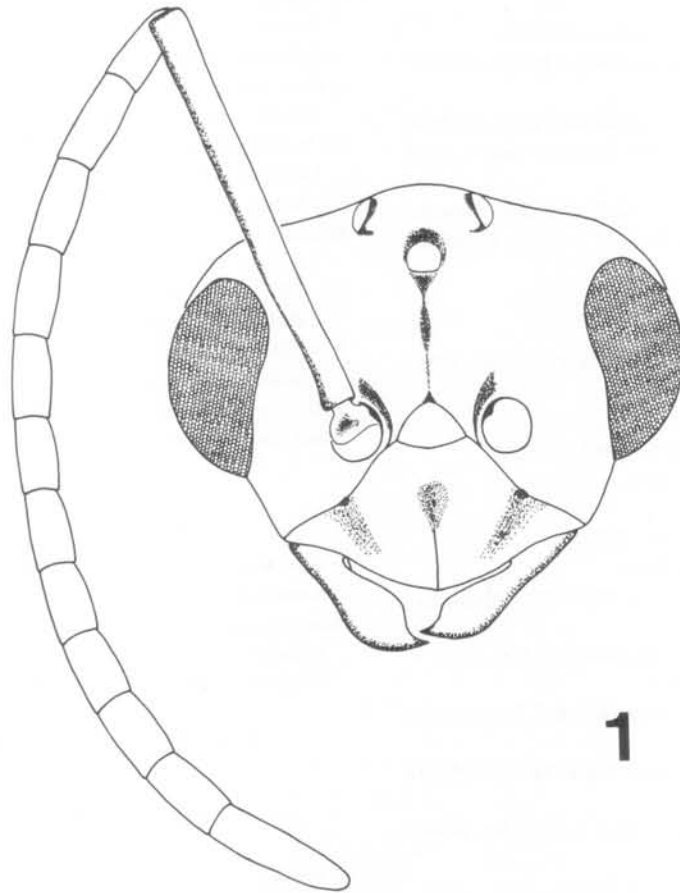
Formica podzolica Francoeur

Formica sibylla: Cook (in part), 1953, p. 393.

Labelled *sibylla*: 18 ♀ from Marysville, CALIF.

Formica subsericea Say

Unidentified: 6 ♀ from Ithaca, N. Y.



FIGURES 1-3. *Formica longipilosa* male (50X). 1, head, frontal view, without pilosity; 2, petiole, lateral view; 3, paramere, lateral view.

FUSCA COMPLEX

Formica accreta Francoeur

Formica fusca var. *subsericea*: Cook (in part), 1953, p. 384.

Formica sibylla: id., p. 393.

Labelled *fusca* var.: 26 ♀ & 1 ♀ from Quincy, CALIF.

Labelled *fusca* var. *subsericea*: 3 ♀ from Stinson Beach, CALIF. (TWC).

Labelled *sibylla*: 5 ♀ from Mirror Lake, Yosemite Valley, 2 ♀ from Glacier Point, Yosemite, 17 ♀ from Carmel (together with 1 ♂ of *Camponotus* sp.), CALIF.

Unidentified: 4 ♀ from Patrick Creek, CALIF.; 1 ♀ from Oswego (Duncan), 2 ♀ from Eagle Creek (LSJU), 1 ♀ from Columbia (LSJU), ORE.

Formica fusca Linné

Formica neogagates lasioides var. *vetula*: Cook (in part), 1953, p. 360.

Formica fusca fusca: id. (in part), p. 369.

Formica cinerea var. *neocinerea*: id. (in part) p. 373.

Formica fusca var. *argentea*: id. (in part), p. 375.

Formica sibylla: id. (in part), p. 392.

Formica fusca: Francoeur, 1973, p. 189–201.

Specimens classified in the *marcida* form:

Labelled *cinerea* var. *neocinerea*: 3 ♀ from Mt. Tamalpais, CALIF.

Labelled *sibylla*: 6 ♀ & 2 ♀ from Alta Meadow (WMW), 2 ♀, 1 ♀ & 1 ♂ from Lake Tahoe (WMW), CALIF.

Labelled *neogagates lasioides* var. *vetula*: 4 ♀ & 1 ♀ from Alta Meadow, CALIF. (WMW).

Labelled *fusca* var. *neoclara*: 3 ♀ from Lake Tahoe, CALIF. (WMW).

Unidentified: 2 ♀ from Yosemite, CALIF.; 1 ♀ from Mt. Hood, ORE. (LSJU).

Specimens classified in the *subaenescens* form:

Labelled *fusca*: 4 ♀ from Lake Tahoe, CALIF. (WMW).

Labelled *fusca* var. *argentea*: 3 ♀ from Colorado Springs, COLO. (E.S. Tucker).

Formica microphthalmalpa Francoeur

Formica sibylla: Cook (in part), 1953, p. 393.

Labelled *sibylla*: 5 ♀ from Lake Tahoe, CALIF. (WMW).

NEORUFIBARBIS COMPLEX

Formica neorufibarbis Emery

Formica subpolita: Cook (in part) 1953, p. 395.

Labelled *rufibarbis* var. *gnava*: 8 ♀, 3 alated ♀ & 1 ♂ from Lake Tahoe, CALIF. (WMW).

Labelled *subpolita*: 18 ♀ & 3 ♀ Blue Lake, CALIF. (J.C. Bradley).

Labelled *subpolita* var. *camponoticeps*: 11 ♀ from Glacier Point, CALIF. (WMW).

The workers of the above series are among the largest for the species.

Labelled *fusca* var.: 2 ♀ from San Juan Isl., WASH.

Unidentified: 1 ♀ from Paradise Valley, 2 ♀ from Mt. Hood, 6 ♀ from Cannon Beach, ORE; 1 ♀ from San Juan Isl., WASH.

RUFIBARBIS COMPLEX

Formica foreliana Wheeler

Labelled *fusca* var. *gnava*: 3 ♀ from Ramsey Canyon, Huachuca Mts. ARIZ. (WMM). These are topotypes.

Formica occidua Wheeler

Formica rufibarbis var. *occidua*: Cook (in part) 1953, p. 391.

Formica rufa obscuripes: id. (in part), p. 406.

Formica rufa propinqua: id. (in part), p. 409.

Formica microgyna californica: id. (in part), p. 413.

Labelled *rufibarbis* var. *occidua*: 1 ♀ from Stanford University, 21 ♀ from Napa (TWC), 6 ♀ from San Rafael, CALIF. (TWC).

Labelled *rufibarbis* var. *gnava*: 3 ♀ from Santa Cruz Isl., CALIF. (R.V. Chamberlain).

Labelled *rufa obscuripes*: 1 ♀ from Marin Co. (TWC), 15 ♀ from Del Monte (TWC), 9 ♀ from Santa Cruz Isl., CALIF. (R.V. Chamberlain).

Labelled *truncicola integroides* var. *propinqua*: 4 from Pismo (Beach), and 3 ♀ from Santa Cruz Isl., CALIF. (R.V. Chamberlain).

Labelled *microgyna californica*: 3 ♀ from Del Monte (TWC), 6 ♀ from Santa Cruz Isl., CALIF.

Unidentified: 3 ♀ from Cazadero (J.C. Bradley), 5 ♀ from Garberville, 3 ♀ from Santa Cruz Isl. (R.V. Chamberlain), 2 ♀ from Santa Clara Co. (Harkins), 1 ♀ from Berkeley, 20 ♀ from Davis, CALIF.

SIBYLLA COMPLEX

Formica sibylla Wheeler

Formica sibylla: Cook (in part), p. 393.

Labelled *sibylla*: 3 ♀ from Happy Isles, Yosemite Valley, 3 ♀ from Alta Meadow, 3 ♀ from Lake Tahoe, CALIF.

Labelled *fusca*: 3 ♀ from Lake Tahoe, CALIF.

Without name: 4 ♀ from Glacier Point, CALIF.

SPECIES ERRONEOUSLY CITED

AS FORMICA

Subf. DOLICHODERINAE

Tapinoma sessile (Say)

Formica fusca var. *marcida*: Cook (in part), p. 379.

Labelled *fusca* var. *marcida*: 3 ♀ from Mt. Tallac, Lake Tahoe, CALIF.

Subf. FORMICINAE

Lasius niger (Linné)

Formica neogagates var. *lasioides*: Cook (in part), p. 360.

Labelled *neogagates* var. *lasioides*: 3 ♀ from Lake Tahoe, CALIF.

Lasius pallitarsis (Provancher)

Formica fusca var. *blanda*: Cook (in part), p. 377.

Labelled *fusca* var. *blanda*: 6 ♀ from Alta Meadow, CALIF.

Myrmecocystus mendax Wheeler

Formica subpolita camponoticeps: (in part), p. 397.

Labelled *subpolita* var. *camponoticeps*: 6 ♀ from Hidden Springs Canyon, CALIF. (Snelling, 1976).

Myrmecocystus mimicus Wheeler

Formica sibylla: Cook (in part), p. 393.

Labelled *sibylla*: 2 ♀ from Pasadena, CALIF.

In each of the above the specimens cited are the only examples from the cited localities with the identification listed. They are, therefore, the presumed basis for the record in Cook's book.

ACKNOWLEDGMENT

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