

It would appear, then, that *nevadensis* is a distinctive population very closely related to *microgyna* and, from data obtained thus far, the two are allopatric. It might be mentioned that the writer has made collections of *microgyna*, which compare favorably with those taken at Manitou, Colorado (the type locality of *microgyna*), from Lamoille Canyon, in the Ruby Mountains of Northeastern Nevada, at an elevation of 6,300 feet. *F. densiventris* Viereck was collected in both Lamoille Canyon and the Lake Tahoe area.

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**STUDIES OF NEVADA ANTS. IV.
 DESCRIPTIONS OF SEXUAL CASTES OF THREE
 MEMBERS OF THE RUFA GROUP OF THE
 GENUS FORMICA L.¹**

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During the summer of 1954, the writer made intensive studies of ants in Nevada. Among the collections taken at Lake Tahoe, which is situated within the borders of both Nevada and California, are samples from nests of *Formica integroides propinqua* Wheeler, *planipilis* Creighton,² and *integra tahoensis* Wheeler. The series include both males and females of *propinqua* and *tahoensis* and females of *planipilis*, none of which has heretofore been described in the literature. The descriptions follow.

Formica integroides propinqua Wheeler

Female (nest queen). Cole Coll. No. Nev.-166.

Head length, 1.90 mm.; head width, 1.92 mm.; scape length, 1.70 mm.; pronotal width, 1.79 mm.; thoracic length, 3.44 mm.

Head with occipital border nearly straight; occipital corners broadly convex. Hairs on cranium absent except for numerous, long, rather slender, yellow, flexuous ones on the clypeus and a scattering of six, long, slender, pointed ones on the gula. Eyes hairy; mandibular hairs long, sharp, suberect and subdecumbent. Pubescence yellowish, short, fine, appressed, scattered, moderately abundant. Surface of head finely and densely granulose, opaque; frontal area finely shagreened, shining in reflected light.

Pronotum with a few long, grayish-brown hairs scattered near the posterior margin. Hairs on scutum very sparse, scattered, uneven in length. Scutellum with a few long hairs. Hairs absent from paraptera, metanotum, and epinotum. Femora with scattered hairs of variable length. Pubescence rather short, appressed, moderately abundant. Surface of thorax finely and densely granulose; opaque. The petiolar scale, viewed in profile, rather thick

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²The status of this ant is discussed elsewhere in this paper.

at the base, anterior surface rather evenly sloping to the apex which is blunt, posterior surface flat basally and slightly concave apically; viewed from behind, the superior border broadly and evenly elevated apically; a very few short hairs on superior border.

Except for terminal gastric hairs, the only other hairs on the gastric dorsum are on the first segment where they are slender, uneven in length, and scattered chiefly over the anterior half of the segment. Gastric pubescence short, sparse, scattered, not obscuring the shining, finely shagreened surface.

Head, thorax, and petiole dark yellowish red; occipital corners, ocellar triangle, scutum, scutellum, metanotum, meso— and metasternites, and meso— and metathoracic epimera distinctly infuscated. Gaster deep brownish black.

Male. Cole Coll. No. Nev.-166.

Head length, 1.57 mm.; head width, 1.79 mm.; scape length, 1.53 mm.; pronotal width, 2.25 mm.; thoracic length 3.30 mm.; petiolar scale height (from posterior base to superior border), 0.65 mm.; petiolar scale maximum width, 0.95 mm.

Mayrian furrow obsolete. Petiolar scale, viewed in profile, concave mesoposterially; thick from base to about $\frac{2}{3}$ its height, then sloping posteriorly at approximately a 20° rounded angle; viewed from behind, with the lateral borders rounded to the superior border, apical border deeply, evenly, and broadly excised, apical corners distinct and only slightly rounded.

Head with a few, moderately long, erect and suberect, pointed hairs on occipital corners, fewer on occipital border; several long, pointed hairs in ocellar triangle; one long hair slightly mesad to posterior extremity of each antennal fossa. Clypeus with a few, long, erect and suberect hairs; the anterior border with a sparse fringe of more slender hairs of variable length. Mandibles with numerous, long, sharp, suberect, and subdecumbent hairs. Eyes with many, short, erect, rather blunt, grayish hairs. Pubescence yellowish, long, appressed and subappressed; most obvious on occipital corners, genae, clypeus, and the space between the frontal lobes; sparse to absent elsewhere; scapes and funiculi with abundant short, fine, appressed, yellowish pubescence. Head finely and densely granulose.

Scutum (except for a posterior transverse strip) and pronotal dorsum with numerous, moderately long, curved, pointed, erect, brown hairs; hairs fewer on posteriodorsal and dorsolateral portions of scutellum, absent from posterior portion of scutum and anterior portion of scutellum. Thoracic pubescence long, scattered, moderately abundant, appressed and subappressed, yellowish. Femora and tibiae without hairs except for the usual row on the flexor surface of tibiae which extends for the full tibial length. Pubescence of legs similar to that of antennae. Thorax densely and rather coarsely granulose. Hairs on petiolar scale numerous, long, uneven in length, chiefly erect, the tips of many flexuous, pointed, light brown; absent from posterior surface and from apical emargination.

Gastric pilosity very sparse except terminally and a scattering of about two dozen, long, brown hairs across anterior portion of dorsum of first segment; two or three shorter hairs in anteriolateral corners of dorsum of each segment; only an occasional short hair elsewhere on dorsum. Gastric pubescence short, scattered, moderately abundant but not dense, grayish, fully appressed. Gaster densely and finely shagreened.

Head, thorax, petiole, appendages, and gaster opaque. Body and antennae deep brownish black; legs light tan, much of femora infuscated.

Both the queen and several males were collected with workers by the writer from a large colony beneath a stone (heavily banked with detritus) in a dry area with an open stand of pine, at Lake Tahoe, the type locality.

Formica planipilis Creighton

Female (alate). Cole Coll. No. Nev.-149.

Head length, 2.01 mm.; head width, 2.06 mm.; scape length, 1.90 mm.; pronotal width, 2.33 mm.; thoracic length, 3.55 mm.

Head with occipital border straight, occipital corners broadly rounded. Clypeus narrowly but definitely carinate. Hairs present on eyes, mandibles, palpi, and anterior clypeal border; completely absent elsewhere on head except for a single, long, slender, pointed, golden brown hair just in front of each lateral ocellus. Head densely and finely granulose; opaque except for mandibles, frontal pits, and the very shining and faintly shagreened frontal area. Pubescence fine, scattered, rather long, moderately abundant.

Thorax devoid of hairs except for a small cluster of moderately long, suberect ones near the extreme anterior margin of the center of the pronotal dorsum, a few very short ones on the sides of the mesothoracic paraptera, and two long, slender ones on the scutellum. Pubescence short, appressed and subappressed, moderately abundant. Surface densely and finely granulose, opaque. Petiolar scale, viewed in profile, thick basally, anterior surface convex, posterior surface broadly concave (more so apically), the apex thin and sharp; viewed from behind, superior border broadly and unevenly elevated mesally; a few rather short, delicate hairs just in front of the superior border; pubescence rather dense and long; surface shagreened, opaque.

Gastric hair pattern similar to that of *propinqua* female; pubescence dense, giving the gaster a subopaque grayish sheen, but not completely concealing the somewhat strongly shining surface.

Head, thorax, legs, and petiole a dull reddish yellow; a small area around each ocellus lightly infuscated; mandibles brown; scutum with a medioanterior splotch and two lateral, longitudinal, wide bands of brownish infuscation; mesothoracic paraptera, medioposterior portion of scutellum, and antennal funiculi deeply infuscated; gaster black except for the base of the first segment which is reddish brown.

The described female is one of several taken together with other females and a long series of workers by the writer from a nest of *planipilis* observed at Nevada Beach, Lake Tahoe, Nevada. The large (4 feet in diameter and 18 inches in height), domed, thatched mound had been constructed around a dead sagebrush on the periphery of a dense pine woods. The colony was very populous. The characteristics of the female described hold very well for the other females in my series.

F. planipilis was described originally from the worker caste, as a subspecies of *F. rufa* by Creighton (1940, p. 9). Subsequently Creighton (1950, p. 490) related it as a subspecies of *F. integroides* Emery. Inasmuch as *planipilis* occurs at Lake Tahoe at the same station as does *F. integroides propinqua* Wheeler, and without any indication of intergradation, either it or *propinqua* should not be regarded as a subspecies of *integroides*. Because of the nature of the known ranges of the three forms, I have therefore elected to elevate *planipilis* to specific rank. The type locality of *planipilis* is Mt. Wheeler, Nevada. I have collected this species from Austin, Ely, and the Ruby Mountains, Nevada, as well as from Lake Tahoe. All nests observed were similar in construction. The range of the species in Nevada appears to be extensive but discontinuous. To my knowledge, *planipilis* has not been found at elevations of less than 6,300 feet.

F. integra tahoensis Wheeler
 Female (alate). Cole Coll. No. Nev.-109

Superior border of petiolar scale sharp, the elevated, moderately and broadly excised median portion being especially so. Cephalic hairs absent except on the eyes, mandibles, palpi, and anterior border of the clypeus; thoracic hairs absent except for a few short, erect ones on the pronotal collar, scutum, and paraptera and a few considerably longer ones on the posterior half of the scutellum; hairs absent from legs except for the usual flexor surface rows; superior petiolar border with very sparse and short, erect hairs; gastric pilosity extremely sparse, there being a scattering of a number of short, rather blunt, and chiefly suberect hairs on the anterior surface of the first tergite and just a few, scattered, longer and more slender ones along the anterior and posterior borders of each succeeding tergite.

Head, thorax, legs, and petiole lighter than in the worker, being a dull, light tan; scutum with median and lateral infuscation; paraptera, scutellum, metanotum, meso—and metathoracic epimera, meso—and metathoracic sternites and episternites, posterior border of pronotum, and superior margin of petiolar scale rather deeply infuscated; head with a small infuscation behind each compound eye and in the ocellar triangle.

Head, except clypeus, mandibles, and frontal area, opaque; clypeus subopaque; frontal area very smooth and strongly shining; gaster subopaque. Pubescence on entire body moderately dense.

Male. Cole Coll. No. Nev.-109.

Resembling the male of *F. integra haemorrhoidalis* Wheeler, from which it differs principally in the following respects: (1) Erect hairs much less abundant, (2) tibiae without hairs except for the usual row on the flexor surface, and (3) frontal area opaque.

From *F. integra* Nylander it differs chiefly in the following characteristics:

(1) Erect hairs present, (2) eyes hairy, and (3) frontal area opaque.

Males and females were taken together with workers from a large, domed mound of detritus over a large stone in a dry, sagebrush area with scattered pine, near the shore of Lake Tahoe, at Nevada Beach. Lake Tahoe is the type locality of *tahoensis*. I was unable to find this ant elsewhere.

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NEW SYNONYMY IN THE GENUS *MANICA* JURINE (HYMENOPTERA: FORMICIDAE)¹

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More than forty years ago, Wheeler (1914, pp. 120-121) described as new, two species of *Manica* which he named *Myrmica* (*Oreomyrma*) *aldrichi* and *hunteri*, one having been collected from Idaho and the other from Montana. In his book on North American ants, Creighton (1950) lists as the range of *aldrichi* (p. 108) "mountains of northern Idaho to the Cascade Range in

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