

**A FURTHER CONTRIBUTION TO THE TAXONOMY AND BIOLOGY OF  
THE INQUILINE ANT, *LEPTOTHORAX DIVERSIPILOSUS* SMITH  
(HYMENOPTERA, FORMICIDAE)**

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In 1939 (Proc. Ent. Soc. Wash. 41: 179) I described a new ant, *Leptothorax* (*Mychothorax*) *diversipilosus*, from two workers and an ergatoid female collected by Falconer Smith at Fort Lewis, Wash., from a nest of the western thatching ant (*Formica obscuripes* Forel). The nest was found in the humid Transition Zone at approximately sea level, in an area dominated by Douglas-fir trees and low grass of the genus *Poa*. The soil in the immediate vicinity bore a layer of moss, *Eurynchium oregonum*. After the description was published I studied specimens of *diversipilosus* further and noted the general similarity in habitus, and later in biology, to the well-known inquiline species *Formicoxenus nitidulus* (Nyl.) of Europe and Asia.

*Formicoxenus nitidulus* has been collected on numerous occasions from the nests of *Formica rufa* L. and *Formica praetensis* Retz. and less frequently from those of *Formica exsecta* Nyl. and *Formica truncorum* F. A. colony of *nitidulus* may be composed of workers, females, forms intermediate between workers and females, and worker-like, wingless males. It is usually small and found fairly deep within the nest of the host ants. The nests of the two species, although distinct from each other, have free intercommunication. Host and guest ant are friendly or tolerant of each other. They do not feed on the other's brood or food, nor do they attempt to feed each other. When the host ants move their nest to a new location, the guest ants trail along in the file with the hosts. On a number of occasions mating between the wingless males and winged females of *nitidulus* has been observed on the exterior of the nest. For a more detailed account of *nitidulus* the reader is referred to Wheeler (Amer. Nat. 35: 535, 1901, and his book "Ants," Columbia Univ. Press, 1910 and 1926 editions, p. 431).

Wishing to secure more specimens of *diversipilosus* and also notes on the biology of this ant, I wrote W. W. Baker of Puyallup, Wash., who found two colonies at Spanaway, Wash., on August 3, 1940. One was within a nest of *Formica obscuripes*, the other in an independent nest in some rotten wood near a colony of *obscuripes*. Concerning colonies found in nests of the host ant, he remarked that he failed to obtain these ants on his first visit to the prairie, because he did not look for their nests in the rotten or punky wood rather deep within the nests of *obscuripes*. It appeared to him as though burrows of other insects were sometimes utilized for nest chambers. He also found small amounts of lichens and dried fungi in the nests apart from the brood chambers, but was not able to ascertain whether

or not they were used for food. Among the approximately 150 individuals received from Mr. Baker were numerous workers, females, intermediate forms between workers and females, and a few wingless, workerlike males. Since the female and male of *diversipilosus* have not been previously described, a description of each is given below, as is a figure of the male.

*L. diversipilosus* has also been collected at Tenino, Wash., by E. A. Schwarz. Should the species be as widely distributed as its host, one may expect to find it in the western provinces of Canada and in the United States from at least the Dakotas to Oregon and Washington and south to Colorado.

A comparison of *diversipilosus* with *nitidulus* shows many striking similarities. Both species have the same castes and intermediate forms, live within the nests of their host ants (various species of *Formica*), and have almost identical habits and a habitus that is so similar as to be more than just superficial. However, the worker of *nitidulus* is distinct from that of *diversipilosus* in color, sculpture, and pilosity. The former is a darker, reddish color and has a rather smooth and polished body and a few simple hairs. The latter, lighter in color, has most of the body (excluding the gaster) punctulate and bearing both simple and clavate hairs. Unlike *diversipilosus*, *nitidulus* has a lamellate process beneath the petiole and a very long and prominent spine beneath the postpetiole. I believe that *nitidulus* is the more highly specialized of the two. It is entirely possible that future studies based on additional material may prove these species congeneric because of intermediate or annectant forms.

The tribe Leptothoracini (to which both ants belong), as outlined by Emery, 1921 (Wytzman Genera Insect., fasc. 174a, p. 244), is composed of such a large number of species of heterogeneous habits and anatomy that it does not seem wise at this time to attempt to evaluate the taxonomic status or relationship of any of them, especially of *nitidulus* and *diversipilosus*. Only a complete revision of the tribe could possibly accomplish this.

Another North American ant that will probably be found to have habits similar to those of *diversipilosus* is *Leptothorax hirticornis* Emery. This ant was originally described from specimens from Hill City, S. Dak., without reference to host. At the time I described *diversipilosus* I gave characters for distinguishing the worker from that of *hirticornis* as did Creighton, 1950 (Ants of North America, Harv. Univ., Bul. Mus. Compar. Zool. 114: 258). Neither the male nor the typical female of *hirticornis* has yet been described.

It is hoped that some student of ants who has easy access to colonies of *diversipilosus* will undertake a thorough study of the biology of this species and answer for us such questions as to what comprises their food, their method of establishing colonies, and how this habit of becoming a guest originated.

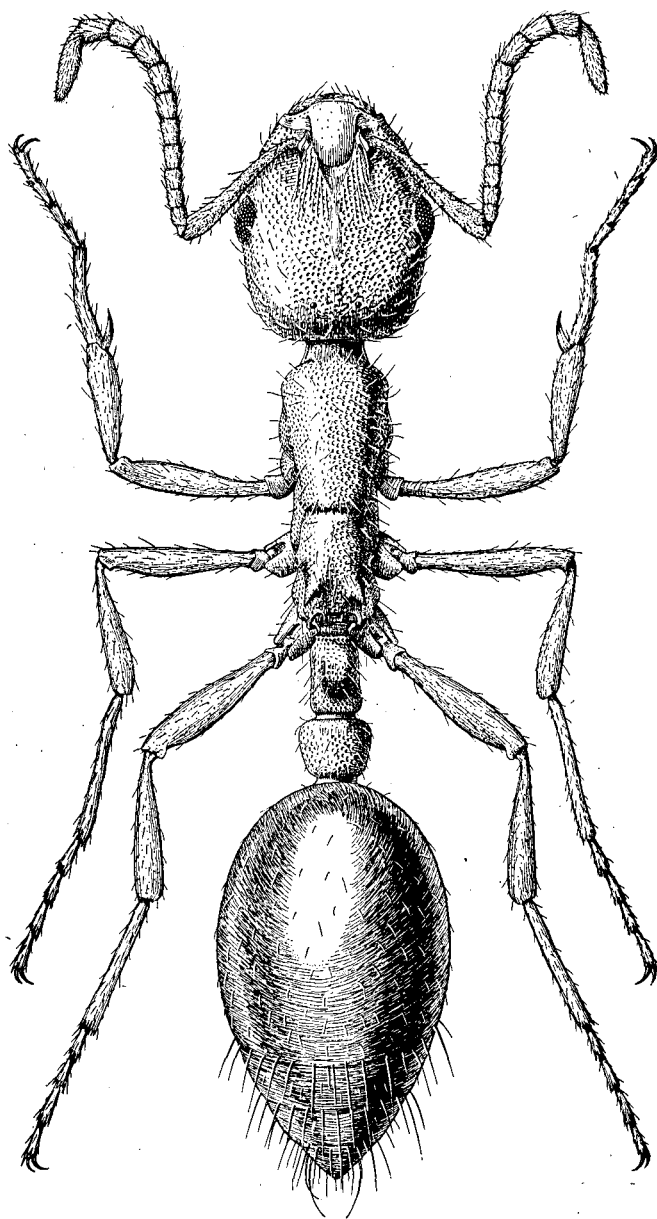


Fig. 1. *Leptothorax diversipilosus* Smith, ergatoid male.

**Leptothorax diversipilosus** M. R. Smith

*Ergatoid male* (fig. 1).—Length 2.5-2.75 mm.

Head, excluding mandibles, approximately one-sixth longer than broad, with straight or feebly rounded posterior border, rounded posterior corners and convex sides behind the eyes; sides anterior to eyes converging anteriorly, thus giving the area in the vicinity of the mandibles a narrow, reduced appearance. Eye larger and more convex than that of the worker. Antenna 12-segmented; scape noticeably enlarged toward the apex, not attaining the posterior border of the head; funiculus more slender than that of the worker, the segments progressively enlarged apically but without forming a clearly differentiated club, the three segments preceding the last subequal in length. Clypeus prominent, strongly convex, protruding above and beyond the mandible and partly concealing them; the anterior and posterior borders rounded, the posterior border more rounded than the anterior and extending well between the frontal carinae. Mandible greatly reduced; masticatory margin with a long apical and several small, indistinct teeth. Vertex of head with small, indistinct ocelli. Frontal area poorly defined. Thorax, petiole, and postpetiole similar to that of the worker but more slender. Promesonotal suture obsolete. Postpetiole more convex dorsally than that of the worker. Gaster similar to that of worker, when viewed from above, with the first segment occupying almost all of the dorsal surface; genitalia concealed.

Hairs moderately abundant, simple, grayish, short, suberect to erect; some of the hairs on the head and appendages appear to be a little thicker than those on the remainder of the body and to assume a slightly clavate form, especially a small number on the vertex of the head. Hairs at apex of gaster the longest.

Head, thorax, petiole and postpetiole punctate, subopaque; scape, femur and tibia more finely punctate, almost shining in certain lights. Most of the clypeus, frontal area, a median line or spot on front of the head, and gaster, smooth and shining.

Color dirty ferruginous, lighter than that of the worker; gaster dark brown, almost black.

Described from eight males collected at Spanaway, Wash., on August 3, 1940, by W. W. Baker and one male collected at Tenino, Wash., by E. A. Schwarz.

The male closely resembles the worker, but can be distinguished from that caste by an additional segment to its antenna, and also by its more slender funiculus; the greatly narrowed head in the vicinity of the mandibles; the reduction in the size of the mandible and in the number of well-developed teeth; the presence of ocelli; the less stout petiole and postpetiole; the presence of male genitalia, although these are usually concealed at the apex of the gaster; the absence of distinctly clavate or capitate hairs on the tips of the femur, tibia, and metatarsus; the weaker sculpturing of the body, and the lighter color.

*Dealate Female*.—Length 3-3.5 mm.

Similar to the worker except for the following: Larger, stouter and more deeply colored. Eye larger and more convex. Thorax with the usual sclerites typi-

cal of a female (queen); viewed from above, with prominent but rounded humeral angles and a distinct constriction or concavity on each side of the body anterior to the insertions of the front pair of wings.

Described from four females collected at Spanaway, Wash., and two females from Tenino, Wash. The females from Tenino are similar to those from Spanaway except that they are lighter in color.