

Reprinted from JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY,
Vol. LX, March, 1952, pages 55-63.

ON THE COLLECTION OF ANTS MADE BY TITUS
ULKE IN THE BLACK HILLS OF SOUTH
DAKOTA IN THE EARLY NINETIES

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The history of North American formicology is so little known that the average student is in almost complete ignorance of details pertaining to early collections and collectors, or conditions under which collections were made. This especially applies to a small but important collection made by Titus Ulke in Hill City and vicinity in the Black Hills of South Dakota. The purpose of this article is to make known such facts as are available to the writer.

In 1890 and 1891 Titus Ulke, a mineralogist by profession, was employed by a mining company operating in the vicinity of Hill City. During his leisure time, which was considerable, Ulke collected myrmecophilous beetles for his father, Henry Ulke of Washington, D. C., a distinguished portrait painter by vocation and an eminent coleopterist by avocation. Ulke senior, however, had no connection with the Federal Bureau of Entomology or the Smithsonian Institute, as some individuals possibly think, but he did have a number of friends in these organizations. Among them was Theodore Pergande, who was employed by the Bureau of Entomology to work on miscellaneous insects. Pergande was deeply interested in ants, especially North American forms, and was continually collecting them, receiving specimens from friends and maintaining a private collection in his home. Since North American formicology was still in its infancy, Pergande sent many of his specimens for identification to Mayr, Emery and Forel, the noted European formicologists of that time. It thus came about that Henry Ulke referred to Pergande the ants found by his son, Titus Ulke, in South Dakota. Pergande, in turn, submitted them to Carlo Emery of the University of Bologna, Italy, and they, along with other North American forms assembled by Emery, were treated in his important articles on the ants of our fauna (*Beiträge zur Kenntniss der nordamerikanischen Ameisenfauna*, Zool. Jahrb., Abt. f. System. 7: 633-

682, 1 plate with 29 figs., 1893 and 8: 257-360, 1 plate with 24 figs., 1895). In these two papers thirty-two forms from Hill City and vicinity are listed, and ten of them are described as new. It was Pergande's habit to divide his series and to retain some specimens of each form for his own collection when he sent material to a specialist. If the ants proved to be new, he labeled his specimens as types, although they were not really types since the authors of the names had not seen them. Such specimens from the Pergande collection can now be found in the Museum of Comparative Zoology, Cambridge, Mass., the National Museum, Washington, D. C., and the American Museum of Natural History, New York City.

Titus Ulke, now in his eighties and living in Washington, D. C., has very kindly prepared for the author a detailed account of his ant collecting at Hill City and vicinity and the conditions under which it was done. His statements read as follows:

"In 1890 and 1891 I lived in Hill City on Spring Creek, Pennington County, South Dakota as assayer to the Harney Peak Tin Company and spent much of my leisure time collecting myrmecophilous beetles and their hosts, the ants, for my father, Henry Ulke of Washington, D. C. These I forwarded to Washington where my father separated the ants from the beetles and turned them over to the government entomologist, Theodore Pergande. He in turn sent them to Dr. Carlo Emery of the University of Bologna, Italy, who named the specimens and described the new species I had discovered, including one in my honor, *Formica ulkei*."

"My collecting ground, lying approximately within a radius of a dozen miles of Hill City, was rather varied in nature, including grassy open parks, wooded hills, and barren rocky slopes. In the open parks grew tall and handsome Western yellow pine (*Pinus ponderosa*) under which the ground was usually covered by thick mats of pine needles or tufts of Buffalo grass (*Boutelouya oligostachys*) and old decaying logs, in and under which the ants liked to nest. The soil was sandy, the land arid, but the climate mostly fine and sunny, light cooling rains falling frequently from 2 to 4 P. M. on warm afternoons.

"About 8 miles south of Hill City arose Harney's Peak, a pic-

turesque peak of nearly 7,300 feet high, the highest mountain in the United States east of the Rockies. It was frequently the goal of my Sunday all-day hikes. Along its lower brushy slopes, clothed with lodge-pole pines and Englemann spruces, I found some interesting ant colonies under slabs of granite or schist. Not far away was the famous Etta Tin Mine, a geologist's paradise. . . .

"The Harney Peak Tin Company's numerous prospects dotted a hilly area some 5 by 12 miles stretching from Hill City to Custer (located about 12 miles south of Hill City) and to Harneys' Peak. . . . In the open fields near the mines were occasionally seen low mounds of granitic sand constructed by the ants but more frequently the ants were under logs, boards and flat stones."

Holotypes or cotypes of the forms from Hill City and vicinity described by Emery as new should be found in the Emery collection which is now in the Museum of the City of Genoa, Italy. Not all forms recorded by Emery are specifically distinct, some being either intermediate or transitory between two other forms or of subspecific status. Below are listed all the South Dakota ants mentioned by Emery in the two articles referred to above. In each case the first name cited is the name assigned the form by Emery; this is followed in parentheses by the present name as given in Creighton's "The Ants of North America" (April 1950), the caste or castes seen by Emery and the locality. The statement, "One of several localities" means that the form in question was recorded by Emery from other localities as well as from Hill City and vicinity. "One of the original localities," means that the form was described as new by Emery from specimens coming from a number of localities including Hill City and vicinity. An asterisk preceding the name of a form indicates that Hill City and vicinity is the type locality.

1. *Myrmica rubra* L. subsp. *brevinodis* n. subsp. (*Myrmica brevinodis* Emery)

♂ ♀. S. Dakota. One of several localities. 8: 312-313 (1895). According to Emery the Dakota specimens represent a transitory form between *brevinodis* and *sulcinodis*.

Type locality of *brevinodis*, Salt Lake, Utah.

2. *Myrmica rubra* L. subsp. *brevinodis* n. subsp. var. *sulcinodoides* n. var. (*Myrmica brevinodis* Emery)
 ♀. S. Dakota. One of the original localities. 8: 313 (1895). For type locality of *brevinodis*, see above.
3. *Myrmica rubra* L. subsp. *scabrinodis* Nyl. var. *fracticornis* n. var. (*Myrmica lobicornis fracticornis* Emery)
 ♀ ♀. Dakota. 8: 313-314 (1895). According to Emery the Dakota specimens represent a transitory form between the var. *fracticornis* and the var. *sabuleti*.
 Type locality of *fracticornis*, Buffalo, N. Y.
4. *Myrmica rubra* L. subsp. *scabrinodis* Nyl. var. *sabuleti* Meinert (*Myrmica americana* Weber)
 Presumably ♀ ♀ ♂. S. Dakota. One of several localities. 8: 314 (1895). Emery remarked that other workers from S. Dakota are smaller and darker colored than *sabuleti* and are therefore much nearer the var. *schrencki*.
 Type locality of *americana*, Colebrook, Conn.
5. *Crematogaster lineolata* Say subsp. *lineolata* Say typical var. *cerasi* Fitch (*Crematogaster (Acrocoelia) lineolata* (Say))
 ♀. Dakota. One of several localities. 8: 282-283 (1895).
 Type locality of *cerasi*, N. Y., that of *lineolata*, Ind.
6. *Solenopsis molesta* Say (*Solenopsis (Diplorhoptum) molesta* (Say))
 ♀ ♀ ♂. Dakota. One of several localities. 8: 277-278 (1895). According to Emery females from S. Dakota are slightly darker than the typical form.
 Type locality of *molesta*, Ind.
7. *Leptothorax (Leptothorax) muscorum* Nyl. var. (*Leptothorax (Mychothorax) canadensis yankee* Emery)
 1 ♀. Hill City, S. Dakota. 8: 317-318 (1895). Wheeler considered the above-mentioned specimen to belong to his *muscorum* var. *sordidus*, the type locality of which was Boulder, Colo.
 For type locality of *yankee*, see below.
- *8. *Leptothorax (Leptothorax) canadensis* Prov. var. *yankee* n. var. (*Leptothorax (Mychothorax) canadensis yankee* Emery)

♂ ♀. S. Dakota. One of the original localities. 8: 317, 319 (1895). Emery states that a female from S. Dakota was scarcely larger than the worker, with the thorax dark brown, the sculpture rougher.

Type locality of *yankee*, Hill City, S. D.

- *9. *Leptothorax (Leptothorax) hirticornis* n. sp. (*Leptothorax (Mychothorax) hirticornis* Emery)
 1 ♂. Washington, D. C., from Mr. Pergande. 8: 317, 319 (1895). The present author has shown (Proc. Ent. Soc. Wash. 41: 176 (1939)) that the type locality of *hirticornis* is Hill City, S. D. and not Washington, D. C. He believes that *hirticornis* is an inquilinous form which will be found in the nest of some species of *Formica*, most probably *obscuripes* Forel or *melanotica* Emery. There is also reason to assume that this ant will have ergatoid males superficially resembling those of *Formicoxenus nitidulus* (Nyl.) of Europe.
- *10. *Leptothorax (Leptothorax) curvispinosus* Mayr subsp. *ambiguus* n. subsp. (*Leptothorax (Leptothorax) ambiguus* Emery)
 ♂. Hill City, S. Dakota (Pergande). One of the original localities. Type locality of *ambiguus*, Hill City, S. D.
11. *Leptothorax (Leptothorax) rugatulus* n. sp. (*Leptothorax (Leptothorax) rugatulus* Emery)
 ♂. S. Dakota. One of the two original localities. 8: 317, 321 (1895).
 Type locality of *rugatulus*, Colo.
- *12. *Leptothorax (Leptothorax) tricarinatus* n. sp. (*Leptothorax (Leptothorax) tricarinatus* Emery)
 1 ♂. Hill City, S. Dakota, from Mr. Pergande. Only locality mentioned. 8: 318, 321-322 (1895).
 Type locality of *tricarinatus*, Hill City, S. D.
13. *Brachymyrmex heerii* Forel, subsp. *depilis* n. subsp. (*Brachymyrmex depilis* Emery)
 ♂. Dakota, from Mr. Pergande. One of the original localities. 7: 635 (1893).
 Type locality of *depilis*, D. C.

14. *Camponotus herculeanus* L.
No castes mentioned by Emery. Dakota. One of several localities. 7: 674 (1893).
Apparently the form or forms Emery had before him were what Creighton (1950) calls *pennsylvanicus* (Degeer) and *pennsylvanicus modoc* Wheeler. Type locality of *pennsylvanicus*, Pa., of *modoc*, Calif.
15. *Lasius (Lasius) niger* L. var. *neoniger* n. var. (*Lasius (Lasius) niger neoniger* Emery)
♂. Hill City, S. Dakota. One of several localities. 7: 639 (1893). Emery remarks that only a few workers from Hill City agree fairly well in color and pilosity with the typical *niger* but are smaller than the common Palearctic form.
Type locality for *neoniger* has not been designated.
16. *Lasius (Lasius) brevicornis* n. sp. (*Lasius (Chthonolasius) brevicornis* Emery)
♂ ♀ ♂. Dakota. One of the original localities. 7: 637-640 (1893).
Type locality of *brevicornis*, D. C.
17. *Lasius (Lasius) flavus* L. (*Lasius (Chthonolasius) flavus nearcticus* Wheeler)
♂ ♀. Dakota. One of several localities. 7: 637-638 (1893).
Type locality of *nearcticus*, Ill.
18. *Lasius (Acanthomyops) claviger* Roger (*Acanthomyops claviger* (Roger))
♂ ♀. Dakota. One of several localities. 7: 638, 642 (1893).
Type locality of *claviger*, Pa.
19. *Lasius (Acanthomyops) interjectus* Mayr (*Acanthomyops interjectus* (Mayr))
No caste or castes indicated. Dakota. One of several localities. 7: 638, 642 (1893).
Type locality of *interjectus*, N. J.
20. *Formica (Formica) fusca* L. subsp. *subpolita* Mayr var. *neogagates* n. var. (*Formica (Proformica) neogagates* Emery)

- Presumably ♀ ♀ ♂. Castes not definitely indicated. Dakota. One of the original localities. 7: 646, 661-662 (1893). Emery mentions workers and a female from Hill City that are not entirely typical.
Type locality of *neogagates*, Beatty, Pa.
- *21. *Formica (Formica) lasioides* n. sp. (*Formica (Proformica) lasioides* Emery)
3 ♀. Hill City, S. Dakota, from Mr. Pergande. Only locality mentioned. 7: 646, 664 (1893).
Type locality of *lasioides*, Hill City, S. D.
22. *Formica lasioides* Em. var. *picea* n. var. (*Formica (Proformica) lasioides* Emery)
♀. Hill City, S. Dakota, from Mr. Pergande. One of two localities mentioned. 8: 335 (1895). According to Emery the workers from Hill City form a transition from *picea* to *lasioides*.
Type locality of *vetula* (n. name for *picea*), Yale, B. C., for *lasioides*, see above.
23. *Formica (Formica) pallide-fulva* Latr. subsp. *fuscata* n. subsp. (*Formica (Neoformica) pallide-fulva nitidiventris* Emery)
♀ ♀. Hill City, S. Dakota. One of two localities mentioned. 7: 645, 656 (1893). According to Emery somewhat lighter and shining specimens, including a female from Hill City form a transition to *nitidiventris*.
Type locality of *nitidiventris*, D. C.
- *24. *Formica (Formica) fusca* L. var. *subaenescens* n. var. (*Formica (Formica) fusca* L.)
♀. S. Dakota. One of the original localities. 7: 646, 659-660 (1893). Type locality of *subaenescens*, S. D., of *fusca*, Europe.
- *25. *Formica (Formica) fusca* L. var. *neorufibarbis* n. var. (*Formica (Formica) neorufibarbis* Emery)
♀. S. Dakota. One of the original localities. 7: 646, 660 (1893).
Type locality of *neorufibarbis*, Hill City, S. D.
- *26. *Formica (Formica) dakotensis* n. sp. (*Formica (Formica) dakotensis* Emery)

- ♂. Hill City, S. Dakota, from Mr. Pergande. Only locality mentioned by Emery. 7: 644, 652-653 (1893).
Type locality of *dakotensis*, Hill City, S. D.
27. *Formica (Formica) fusca* L. *subpolita* Mayr var.? *specularis* n. var. (*Formica (Formica) dakotensis* Emery)
♀. Dakota, received from Mr. Pergande. One of the original localities. 7: 663 (1893).
Type locality of *specularis*, Wis., of *dakotensis*, see above.
28. *Formica (Formica) rufa* L. subsp. *integra* Nyl. var. *hæmorrhoidalis* n. var. (*Formica (Formica) integra hæmorrhoidalis* Emery)
♂. Dakota. One of the two original localities. 7: 644, 652 (1893).
Type locality of *hæmorrhoidalis*, Colo.
29. *Formica (Formica) rufa* L. subsp. *obscuriventris* Mayr var. *rubiginosa* n. var. (*Formica (Formica) obscuripes* Forel)
♂. Dakota. One of the original localities. 7: 644, 650 (1893). Creighton, 1940, (Amer. Mus. Novitates No. 1055, p. 5) suggested that Emery had a mixed series when describing *rubiginosa*: *Formica rufa obscuripes* Forel (Colo.), *F. rufa integra* Nyl. (Nebr.), *F. rufa melanotica* Emery and *F. rufa gymnomma* Wheeler (S. Dak.). Creighton (1950) considers both *rubiginosa* and *melanotica* a synonym of *obscuripes*, and *gymnomma* a synonym of *obscuriventris* Mayr. The type locality for *obscuripes*, Green River, Wyo., for *melanotica*, Wis., for *gymnomma*, Cold Spring Harbor, Long Island, N. Y., and for *obscuriventris*, Conn.
- *30. *Formica (Formica) ulkei* n. sp. (*Formica (Formica) ulkei* Emery)
♂. Hill City, S. Dakota, from Mr. Pergande. Only locality mentioned. 7: 643, 653-654 (1893).
Type locality of *ulkei*, Hill City, S. D.
- *31. *Formica (Formica) sanguinea* Latr. subsp. *puberula* n. subsp. (*Formica (Raptiformica) puberula* Emery)
1 ♂. Hill City, S. Dakota. 7: 643, 648 (1893). Other specimens from Colorado Emery considered as a transitory

form between *puberula* and *subintegra* Emery.

Type locality of *puberula*, Hill City, S. D., of *subintegra*, D. C.

32. *Polyergus rufescens* Latr. subsp. *breviceps* n. subsp. (*Polyergus rufescens breviceps* Emery)

♂. S. Dakota. One of the original localities. 7: 666 (1893).

Type locality of *breviceps*, Breckenridge, Colo.