

# A Checklist of the Ants of South Dakota

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ABSTRACT — A list of 77 species (1 in Ponerinae, 26 in Myrmicinae, 5 in Dolichoderinae, and 47 in Formicinae) is preceded by a brief treatment of history, biomes, and the Black Hills, and followed by brief accounts of interesting South Dakota ants: thatching ants, mound-builders, slave-makers, the sand-hill ant, and harvesters. The most interesting of all is *Veromessor lobognathus*.

For each species in the list all known records in the state are given by counties. A county map is supplied, which will enable those interested to prepare a distribution map for any species.

The history of myrmecology in South Dakota began in 1890 when Titus Ulke, a mineralogist, started collecting myrmecophilous beetles and their ant hosts in Hill City and vicinity. Smith (1952a) told the interesting story about how the ants eventually reached Emery in Italy. Emery identified them, described the new species, and incorporated the information in his treatise on the North American ant fauna (1893-1895). Included were six new species, for which Hill City is the type locality. Emery's total list for the state comprised 27 species.

The next event was Severin's 1925 article "The Ants of South Dakota," which listed 40 species.

We did most of our collecting in 1957 and 1963, but some in 1964 and 1965 and one record in 1928. We have in all 230 records, mostly from the Badlands, the North Cave Hills, and the Black Hills. Except for one species (*Veromessor lobognathus*), we have not published anything on our South Dakota material.

In 1986 we inquired of D. R. Smith of the U.S. National Museum (USNM) whether the USNM ants were so catalogued that a list of the ants of South Dakota could be easily prepared. The answer was no, but there was a box of South Dakota ants in the Museum that had apparently been there since the days of M. R. Smith. He sent it to us. We identified 130 records for 27 species and returned the collection to Brookings. Burrell McDaniel of South Dakota State University then supplied us with lists of species found in the South Dakota collection which had been collected by Severin and identified by W. M. Wheeler, M. R. Smith, and D. R. Smith. He also sent us for identification material he and his students had collected recently.

By combining records in the literature and the species in these collections we get a state list of 77 species. Twelve of these species are only in our collection: *Acanthomyops subglaber*, *Aphaenogaster occidentalis*, *Dolichoderus taschenbergi*, *Formica cilata*, *F. criniventris*, *F. hewitti*, *F. laeviceps*, *F. oreas*, *F. spatulata*, *Leptothorax crassipilis*, *Paratrechina terricola*, and *Veromessor lobognathus*.

Four biomes can be recognized in South Dakota: Grassland Biome, Northern Coniferous Forest Biome, Temperate Deciduous Forest Biome, and Pinyon-Juniper Biome. The Grassland Biome is by far the most extensive, covering about

90% of the state. The Temperate Deciduous Forest Biome is represented only by the gallery forests along all the streams in the eastern part of the state; these gradually thin out westwardly. The Northern Coniferous Forest Biome enters the state only along the western border. The densest forests are near the center in the Black Hills; to the north and south they thin out. The principal conifers are western yellow pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*), both western. The Pinyon-Juniper Biome barely gets into the state along its western border. There are no pinyons and the characteristic plant is Rocky Mountain juniper.

“The Black Hills are an isolated mountain range or dome surrounded by the Missouri Plateau. . . . It does not differ essentially from some of the smaller mountain groups on the Missouri Plateau nor from some ranges of the Rocky Mountains.” (Fenneman 1931:79.) The Black Hills occupy about 6000 mi<sup>2</sup> (= 15,540 km<sup>2</sup>), which is about 8% of the total area of the state. Their highest elevation is on Harney Peak at 7242 ft (= 2207 m); most of the area is between 2500 ft and 4000 ft.

Since collecting ants in South Dakota has not been sufficiently extensive or intensive and since no ecological data are given in the literature, we have not attempted biogeographic or ecological analyses such as we made for North Dakota (1963), Texas (1985), or Nevada (1986).

#### THE PLAN OF THE LIST

Subfamilies and genera have been arranged as in the Smithsonian catalog (Smith 1979). The species of each genus are arranged alphabetically. The name of the species (or subspecies, in a few cases) is followed by the name of the author. Next we give the names of the counties (Fig. 1) in which that species was col-

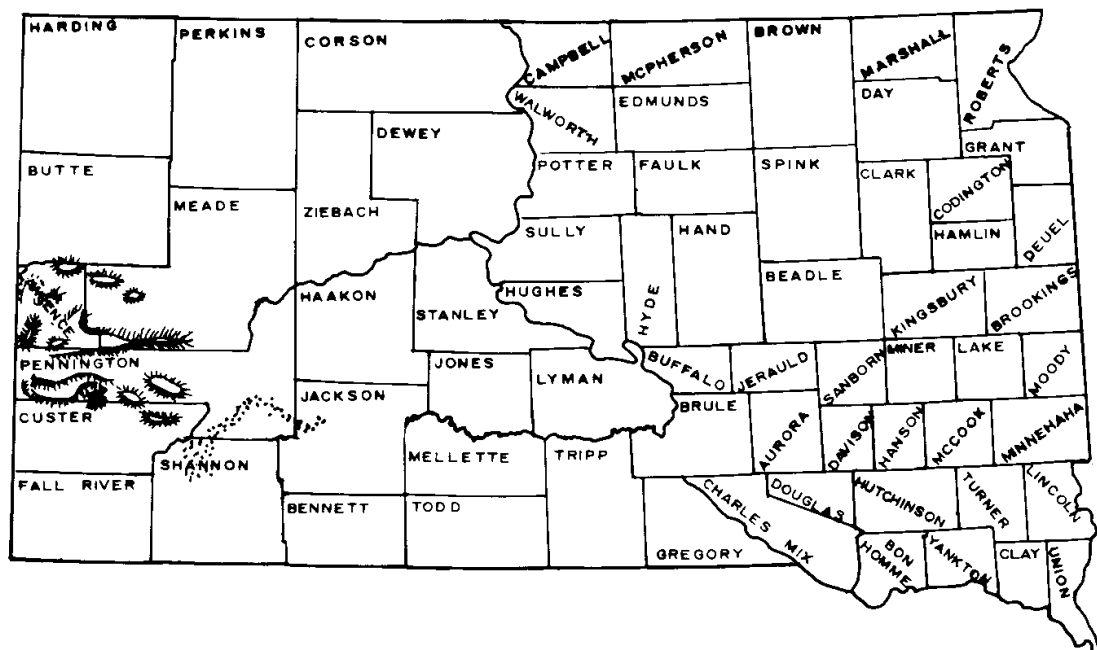


Figure 1. Counties of South Dakota. Note the Black Hills (not labeled) on the western boundary and the “Badlands” (stippled).

lected, arranging them alphabetically. Finally under each county we give the localities for the collections in that county; these are the *records*.

The designation of rural localities presents problems not encountered in the more thickly settled parts of the country. The easiest way to designate a rural locality is to cite direction and distance to the nearest town, but many localities are so remote that such a designation is meaningless. For such localities we have used the legal description. For anyone not familiar with the legal description of land we recommend an American treatise on surveying or our 1963 book (pp. 76-77). Take for example Cedar Pass in Jackson County: the complete legal description would read "section 26, Township 3 South, Range 18 East," which is usually abbreviated to "sec. 26, T. 3 S., R. 18 E." To save space we resort to extreme abbreviation: 26-3S-18E. Townships are either north or south, ranges east or west.

The source of each record is identified as follows: Emery's list (Smith 1952a) by (E), those in the collection at the University of North Dakota by (ND), Severin's 1925 by (S), Wheeler and Wheeler collections by a preceding asterisk, other records from the literature by the author's name and year. Records representing ants in the collection at South Dakota State University by (SD).

#### SUBFAMILY PONERINAE

*Ponera pennsylvanica* Buckley — BROOKINGS CO.: Brookings (SD). HAAKON CO.: Ottumwa (SD). HAND CO.: Ree Heights (SD). HUGHES CO.: Canning (SD). MOODY CO.: Flandreau (SD); 8 mi S of Brookings (SD). LINCOLN CO.: Canton (Smith 1936, SD); Sioux Falls (ND). PENNINGTON CO.: Bear Gulch Camp Road (SD). YANKTON CO.: Yankton (SD).

#### SUBFAMILY MYRMICINAE

*Myrmica americana* Weber — BEADLE CO.: Cavour (SD). BROOKINGS CO.: Brookings (SD, E, S). BROWN CO.: Hecla (SD). BUFFALO CO.: 2 mi E of jct rts 45 & 34 (SD). CAMPBELL CO.: Eureka (SD). DEWEY CO.: Eagle Butte (SD). EDMUNDS CO.: Ipswich (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD); Reva (SD); \*Table Mt. HUGHES CO.: Canning (SD). JACKSON CO.: Cottonwood (SD); Interior (SD). JONES CO.: Capa (Weber 1948, SD). LINCOLN CO.: Canton (SD). LYMAN CO.: Kennebec (SD); Presho (SD). PENNINGTON CO.: Wall (SD); \*36-1S-14E; \*Quinn Table (3-2S-14E).

*Myrmica brevinodis* Emery (= *incompleta*) — BROOKINGS CO.: Brookings (S). HARDING CO.: \*North Cave Hills. JONES CO.: Capa (S, SD). LAWRENCE CO.: Brownsville (Weber 1950); Cement Ridge Overlook (SD); Crow Peak (5787 ft) (SD); nr Iron Creek Lake (SD); 2 mi W of jct rt 222 & 134 (SD); 14 mi S of Spearfish (SD). MEAD CO.: 2 mi from Pennington Co. on rt 137 (SD). PENNINGTON CO.: Hill City (E).

*Myrmica brevispinosa* Emery — CORSON CO.: McLaughlin (SD). HAAKON CO.: Philip (SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: Rapid City (Weber 1950); \*4 mi S of Hill City; \*Keystone. SANBORN CO.: Woonsocket (SD). YANKTON CO.: Yankton (SD).

*Myrmica emeryana* Forel — LAWRENCE CO.: Deadwood (Weber 1948); nr Spearfish (SD); Hwy 385 at Custer Crossing (SD); \*Spearfish Canyon nr Cheyenne Crossing. MOODY CO.: 8 mi S of Brookings (SD). PENNINGTON CO.: \*17-2S-1E; \*Moonshine Gulch Campground (2N-3E); \*Hill City (Weber 1948, E).

*Myrmica fracticornis* Emery — BROOKINGS CO.: Brookings (SD). EDMUNDS CO.: Roscoe (SD). GRANT CO.: Big Stone City (SD). HARDING CO.: \*North Cave Hills. JACKSON CO.: Cottonwood (SD). JONES CO.: Capa (SD). LAWRENCE CO.: Spearfish (Weber 1948); 12 mi W of Spearfish (SD); Lead (SD). LYMAN CO.: Kennebec (Weber 1948). MOODY CO.: Flandreau (SD). PENNINGTON CO.: Hill City (E); \*4 mi S of Hill City. UNION CO.: Elk Point (SD).

*Myrmica monticola* Wheeler — GRANT CO.: Big Stone City (SD). JACKSON CO.: "Interior of Badlands" (SD). PENNINGTON CO.: \*Quinn Table (3-2S-14E).

*Pogonomyrmex occidentalis* (Cresson) — BENNETT CO.: Martin (SD). BUTTE CO.: Newell

(S, SD); Belle Fourche (SD); \*7 mi E of Belle Fourche. CAMPBELL CO.: Mobridge (S). CUSTER CO.: \*25-4S-5E; \*5-4S-1E. DAVIDSON CO.: Mitchell (Cole 1932). FALL RIVER CO.: Hot Springs (SD). HARDING CO.: \*North Cave Hills; \*South Cave Hills; \*11 mi W of Buffalo. HUGHES CO.: Canning (SD); Pierre (SD). JACKSON CO.: \*Cedar Pass; Kadoka (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: \*Spearfish. MINNEHAHA CO.: Sioux Falls (Cole 1932). PENNINGTON CO.: Rapid City (Cole 1932); \*35-1S-14E; \*17-2S-16E; \*Quinn Table (3-2S-14E); \*Badlands Nat. Mon. (Pinnacles Overlook); \*12-4S-17E; Wall (SD).

*Stenammina diecki* Emery — LAWRENCE CO.: Crow Park (SD); Hwy 385 at Custer Crossing (SD). MEAD CO.: Black Hills, 4 mi S of rt 170 (SD).

*Aphaenogaster occidentalis* Emery — JACKSON CO.: \*Cedar Pass. LAWRENCE CO.: \*22-6N-2E. PENNINGTON CO.: \*Hill City.

*Aphaenogaster rudis* Emery — LAWRENCE CO.: 2.5 mi from Iron Creek Lake on rt 196 (SD); Limestone Plateau (SD).

*Veromessor lobognathus* (Andrews) — CUSTER CO.: \*18-3S-1E (4750 ft) (Wheeler and Wheeler 1965).

*Pheidole bicarinata* Mayr — BENNETT CO.: Martin (SD). CUSTER CO.: \*5-4S-1E. DEWEY CO.: Eagle Butte (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD). JONES CO.: Capa (S, SD). PERKINS CO.: Bison (SD). STANLEY CO.: Fort Pierre (SD).

*Pheidole bicarinata vinelandica* Forel — LAWRENCE CO.: Whitewood (S, SD).

*Pheidole pilifera* (Roger) — CUSTER CO.: \*18-3S-1E; \*19 mi W of Custer on Hwy 16. FALL RIVER CO.: Hot Springs (SD).

*Pheidole pilifera coloradensis* Emery — JONES CO.: Capa (S, SD). LAWRENCE CO.: Whitewood (SD).

*Crematogaster cerasi* (Fitch) (= *lineolata*) — BENNETT CO.: Martin (SD). BRULE CO.: Chamberlain (SD). CLAY CO.: Springfield (SD); Vermillion (SD). CUSTER CO.: \*18-3S-1E (4750 ft). DEWEY CO.: Eagle Butte (SD). GRANT CO.: Big Stone City (S, SD). GREGORY CO.: Bonesteel (SD). HAAKON CO.: Philip (SD). HARDING CO.: \*North Cave Hills; \*South Cave Hills; \*Table Mt. HUGHES CO.: Canning (SD); Pierre (SD, E). JACKSON CO.: \*Cedar Pass; Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Iron Creek Lake (SD); \*22-6N-2E. PENNINGTON CO.: Hill City (E); \*4 mi S of Hill City; Wall (SD); \*36-1S-14E. ROBERTS CO.: Sisseton (SD). STANLEY CO.: Ft. Pierre (SD). UNION CO.: Elk Point (SD).

*Monomorium minimum* (Buckley) — BROOKINGS CO.: Brookings (SD); Oakwood Lake (S, SD). BRULE CO.: Chamberlain (SD, S). CORSON CO.: McLaughlin (SD); Walker (SD). DEWEY CO.: Eagle Butte (SD). GRANT CO.: Big Stone City (S, SD). GREGORY CO.: Bonesteel (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD); Camp Crook (S); \*North Cave Hills; Reva (SD). HUGHES CO.: Canning (SD); Fort Pierre (SD). JACKSON CO.: Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Whitewood (SD). PENNINGTON CO.: Wall (SD); \*17-2S-16E. PERKINS CO.: Bison (SD); Lemmon (SD). POTTER CO.: Gettysburg (SD). ROBERTS CO.: Sisseton (S, SD).

*Monomorium pharaonis* (Linnaeus) — BROOKINGS CO.: Brookings (S, SD). HARDING CO.: Camp Crook (S).

*Solenopsis molesta* (Say) — AURORA CO.: Plankinton (SD). BEADLE CO.: Cavour (SD). BROOKINGS CO.: Brookings (E, S, SD); Volga (S, SD). BUFFALO CO.: Ft. Thompson (SD). BUTTE CO.: \*7 mi E of Belle Fourche. CAMPBELL CO.: Eureka (SD); 7 mi N of Herreid (SD). CUSTER CO.: Custer (S, SD); \*18-3S-1E; \*29-4S-2E; \*19 mi W of Custer on Hwy 16. FALL RIVER CO.: Hot Springs (SD). FAULK CO.: Faulkton (SD). HAAKON CO.: Cheyenne River (SD); Billsburg (SD); Ottumwa (SD). HARDING CO.: Buffalo (SD); \*North Cave Hills. JACKSON CO.: Cottonwood (SD). JONES CO.: Capa (S, SD). MELLETTE CO.: White River (SD). PENNINGTON CO.: \*17-2S-16E. SANBORN CO.: Woonsocket (SD). WALWORTH CO.: Akaska (SD). ZIEBACK CO.: S of Dupree.

*Leptothorax ambiguus* Emery — LAWRENCE CO.: Lead (SD); \*Spearfish Canyon (22-6N-2E). PENNINGTON CO.: Hill City (E).

*Leptothorax crassipilis* Wheeler — CUSTER CO.: \*29-4S-2E.

*Leptothorax curvispinosus* Mayr — BON HOMME CO.: Springfield (SD). BROOKINGS CO.: Volga (SD). LAWRENCE CO.: Spearfish (SD).

*Leptothorax hirticornis* Emery — PENNINGTON CO.: Hill City (E).

*Leptothorax muscorum* (Nylander) (= *canadensis*) — CUSTER CO.: Legion Lake (SD).

LAWRENCE CO.: Edelweiss Road (SD); nr Spearfish (SD); 12 mi W of Spearfish (SD); Spearfish Canyon (SD); Lead (SD). PENNINGTON CO.: \*Hill City (E); \*34-1N-1E.  
*Leptothorax rugatulus* Emery — BUFFALO CO.: 2 mi E of jnct rd 45 & 34 (SD). CUSTER CO.: \*29-4S-2E. HARDING CO.: \*North Cave Hills. LAWRENCE CO.: \*Terry Peak (summit 7000 ft).  
*Leptothorax tricarinatus* Emery — BRULE CO.: Chamberlain (SD). CLAY CO.: Meckling (SD). CORSON CO.: Walker (SD). HAAKON CO.: Philip (SD). HUGHES CO.: Canning (SD). JACKSON CO.: Cottonwood (SD). LYMAN CO.: Presho (SD). PENNINGTON CO.: "Interior of Badlands" (SD); Wall (SD). PERKINS CO.: Lemmon. (All of the above from Smith 1952b). BROOKINGS CO.: Brookings (SD). CORSON CO.: Walker (SD). DEWEY CO.: Eagle Butte (SD). GREGORY CO.: Bonesteel (SD). HARDING CO.: Reva (SD). HYDE CO.: Highmore (SD). JACKSON CO.: Interior (SD). LYMAN CO.: Kennebec (SD). PENNINGTON CO.: Hill City (E); \*Quinn Table (3-2S-14E). STANLEY CO.: Ft. Pierre (SD).

#### SUBFAMILY DOLICHODERINAE

*Dolichoderus plagiatus* (Mayr) — LAWRENCE CO.: Whitewood (SD).  
*Dolichoderus taschenbergi* (Mayr) — PENNINGTON CO.: \*5 mi S of Hill City.  
*Forelius pruinosus* (Roger) — CUSTER CO.: \*5-4S-1E; \*18-4S-8E; \*18-3S-1E; \*29-4S-2E; \*18-4S-1E (4750 ft); \*19 mi W of Custer on Hwy 16. FALL RIVER CO.: Hot Springs (S, SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Whitewood (SD). PENNINGTON CO.: \*12-4S-17E.  
*Conomyrma insana* (Buckley) (= *Dorymyrmex pyramicus*) — BENNETT CO.: Martin (SD). CORSON CO.: McLaughlin (SD); Walker (SD). CUSTER CO.: \*5-4S-1E. FALL RIVER CO.: Hot Springs (SD). HARDING CO.: Buffalo (SD). HUGHES CO.: Canning (SD); Pierre (S, SD). JACKSON CO.: \*Cedar Pass; Interior (SD). LAWRENCE CO.: Spearfish (SD). PENNINGTON CO.: \*17-2S-16E; \*Quinn Table (3-2S-14E); Wall (SD). YANKTON CO.: Yankton (SD).  
*Tapinoma sessile* Say — BON HOMME CO.: Springfield (SD). BROOKINGS CO.: Brookings (SD). BRULE CO.: Chamberlain (SD); Kimball (SD). CLAY CO.: Meckling (SD); Vermillion (SD). CORSON CO.: McLaughlin (SD); Walker (SD). CUSTER CO.: Custer (S, SD); \*20-2S-6E (6000 ft); Pringle (S, SD). DEWEY CO.: Eagle Butte (SD); Fox Ridge (SD). GRANT CO.: Big Stone City (S, SD). HARDING CO.: Buffalo (SD); \*North Cave Hills; Reva (SD). HUGHES CO.: Canning (SD). HYDE CO.: Highmore (SD). JACKSON CO.: \*Cedar Pass; Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Lead (SD); Spearfish (SD); \*Spearfish Canyon (22-6N-2E); Hanna (SD); \*Terry Peak; Iron Creek Lake (SD); Cement Ridge Lookout (SD); Roughlock Falls (SD). LINCOLN CO.: Canton (SD). LYMAN CO.: Kennebec (SD). MEADE CO.: Edson (SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: Deerfield Lake (SD); \*Hill City; Pactola (SD); Wall (SD); Edelweiss Road (SD). PERKINS CO.: Bison (SD); Lemmon (SD). ROBERTS CO.: Sisseton (SD). STANLEY CO.: Ft. Pierre (SD). UNION CO.: Elk Point (SD).

#### SUBFAMILY FORMICINAE

*Brachymyrmex depilis* Emery — CLAY CO.: Meckling (SD). MOODY CO.: 8 mi S. of Brookings (SD). LAWRENCE CO.: 14 mi S of Spearfish (SD); Terry Peak Road (SD). PENNINGTON CO.: \*Hill City (E); \*5 mi NW of Hill City.  
*Camponotus herculeanus* (Linnaeus) — CUSTER CO.: Pringle (S). LAWRENCE CO.: Englewood (SD). PENNINGTON CO.: Hill City (E); \*36-1S-5E; Harney Peak (SD); Edelweiss Road (SD).  
*Camponotus modoc* Wheeler — BON HOMME CO.: Springfield (SD). CUSTER CO.: Custer (SD).  
*Camponotus noveboracensis* (Fitch) — CUSTER CO.: Game Lodge (SD); Sylvan Lake (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Spearfish (SD); Whitewood (SD). PENNINGTON CO.: \*Hill City. YANKTON CO.: Yankton (SD).  
*Camponotus pennsylvanicus* (DeGeer) — BENNETT CO.: Martin (SD). CUSTER CO.: Pringle (S, SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: Rapid Canyon (SD). YANKTON CO.: Yankton (SD).  
*Camponotus (Myrmentoma) nearcticus* Emery (= *caryae*) — BROOKINGS CO.: Hendricks Lake (S, SD). CUSTER CO.: Hermosa (S). PENNINGTON CO.: \*Quinn Table (3-2S-14E).  
*Camponotus (Tanaemyrmex) vicinus* Mayr — CUSTER CO.: Custer (S, SD); \*Dewey. FALL RIVER CO.: Cascade Falls (SD); Hot Springs (S, SD). HARDING CO.: \*North Cave Hills; \*South

Cave Hills. JACKSON CO.: \*Cedar Pass. JONES CO.: Capa (SD). LAWRENCE CO.: Whitewood (SD); \*22-6N-2E.

*Lasius alienus* (Foerster) (= *niger americanus*) — BEADLE CO.: Cavour (SD). BENNETT CO.: Martin (SD). BROOKINGS CO.: Brookings (S, SD); Hendricks Lake (S, SD); Oakwood Lake (S). CORSON CO.: McLaughlin (SD); Walker (SD). CUSTER CO.: Custer (S). FALL RIVER CO.: Hot Springs (SD). GRANT CO.: Big Stone City (S, SD). HARDING CO.: Buffalo (SD); \*North Cave Hills; Reva (SD). JACKSON CO.: Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Lead (SD); Spearfish (SD); \*Terry Peak (summit 7000 ft); \*22-6N-2E. PENNINGTON CO.: Wall (SD). STANLEY CO.: Ft. Pierre (SD). YANKTON CO.: Yankton (S, SD).

*Lasius crypticus* Wilson — BUTTE CO.: \*7 mi E of Belle Fourche. CAMPBELL CO.: 7 mi N of Herreid (SD). EDMUNDS CO.: Ipswich (SD); Roscoe (SD). FAULK CO.: Seneca (SD); Faulkton (SD). HARDING CO.: \*North Cave Hills. JACKSON CO.: \*Cedar Pass. JERAULD CO.: Wessington Springs (SD). JONES CO.: Capa (Wilson 1955). LAWRENCE CO.: Roughlock Lake (SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: \*Badlands Nat. Mon. (Pinnacles Overlook); \*4 mi S of Hill City; \*17-2S-16E; \*Quinn Table (3-2S-14E); Hill City (Wilson 1955). POTTER CO.: Gettysburg (SD). SPINK CO.: Redfield (SD). ZIEBACH CO.: S of Dupree (SD).

*Lasius fallax* Wilson — BROOKINGS CO.: Hendricks Lake (SD). JONES CO.: Capa (Wilson 1955). PENNINGTON CO.: \*Hill City.

*Lasius flavus* (Fabricius) (= *brevicornis*) — BROOKINGS CO.: Hendricks Lake (S, SD). CUSTER CO.: Custer (S, SD). FALL RIVER CO.: Hot Springs (S, SD). HARDING CO.: \*North Cave Hills. LAWRENCE CO.: Laird Peak (SD); Citadel Rock (SD); Custer Crossing & hwy 385 (SD); \*Spearfish Canyon (22-6N-2E); \*Terry Peak (summit 7000 ft); \*Spearfish Canyon nr Cheyenne Crossing. MEADE CO.: Bethlehem (SD). PENNINGTON CO.: \*Hill City (E, Wilson 1955); \*12-4S-17E; \*4 mi S of Hill City; \*Moonshine Gulch Campground nr Rockford.

*Lasius neoniger* Emery — BENNETT CO.: Martin (SD). BON HOMME CO.: Springfield (SD). BROOKINGS CO.: Brookings (S, SD); Hendricks Lake (S, SD); Oakwood Lake (SD). BROWN CO.: Hecla (SD). BRULE CO.: Chamberlain (SD). BUTTE CO.: \*8-11N-3E. CAMPBELL CO.: 7 mi N of Herreid (SD). CLAY CO.: Vermillion (SD). CODINGTON CO.: Florence (SD). CORSON CO.: McLaughlin (SD). FALL RIVER CO.: Hot Springs (SD). GRANT CO.: Big Stone City (SD). HARDING CO.: Buffalo (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Lead (SD). MEADE CO.: Sturgis (SD). PENNINGTON CO.: Hill City (E); \*35-1S-14E. ROBERTS CO.: Sisseton (SD). UNION CO.: 5 mi N of Elk Point (SD). WALWORTH CO.: Akaska (SD).

*Lasius sitiens* Wilson — CUSTER CO.: Blechers Rock (SD). MEADE CO.: 2 mi from Pennington Co. on Rt. 137.

*Lasius sitkaensis* Pergande (= *pallitarsis*). BROOKINGS CO.: Hendricks Lake (S, SD). HARDING CO.: \*North Cave Hills. JONES CO.: Capa (S, SD). LAWRENCE CO.: "in Black Hills" (SD). MOODY CO.: Flandreau (SD). PENNINGTON CO.: \*Hill City. WALWORTH CO.: Akaska (SD).

*Lasius umbratus* (Nylander) — BROOKINGS CO.: Hendricks Lake (S, SD). EDMUNDS CO.: Ipswich (SD). LAWRENCE CO.: Lead (SD); \*Terry Peak (summit 7000 ft). MELLETTE CO.: White River (SD).

*Acanthomyops coloradensis* (Wheeler) (= *claviger*) — BENNETT CO.: Martin (SD). EDMUNDS CO.: Ipswich (SD). JACKSON CO.: \*Cedar Pass. MINNEHAHA CO.: Sioux Falls (SD). PENNINGTON CO.: Hill City (E).

*Acanthomyops interjectus* (Mayr) — CLAY CO.: Vermillion (SD). CUSTER CO.: Custer (S). FALL RIVER CO.: Hot Springs (S, SD). JONES CO.: Capa (S, SD). PENNINGTON CO.: Harney Peak (SD); Hill City (E); \*Quinn Table (3-2S-14E).

*Acanthomyops latipes* (Walsh) — HUGHES CO.: Pierre (S, SD).

*Acanthomyops subglaber* (Emery) — LAWRENCE CO.: \*Terry Peak (summit 7000 ft); \*Spearfish Canyon nr Cheyenne Crossing. PENNINGTON CO.: \*Hill City.

*Paratrechina terricola* (Buckley) (= *melanderi*). JACKSON CO.: \*Cedar Pass.

*Formica argentea* Wheeler — BON HOMME CO.: Springfield (SD). BROOKINGS CO.: Brookings (S, SD). CLAY CO.: Meckling (SD); Vermillion (SD). CORSON CO.: McLaughlin (SD); Walker (SD). DEWEY CO.: Eagle Butte (SD); Fox Ridge (SD). GRANT CO.: Big Stone City (S, SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD). HUGHES CO.: Canning (SD); Pierre (SD). HYDE CO.: Highmore (SD). JACKSON CO.: \*Cedar Pass; Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Spearfish (SD). LYMAN CO.: Presho (SD). PEN-

NINGTON CO.: \*Hill City; Pactola (SD). POTTER CO.: Gettysburg (SD). ROBERTS CO.: Sisseton (SD). STANLEY CO.: Fort Pierre (SD). YANKTON CO.: Yankton (S, SD).

*Formica bradleyi* Wheeler — BENNETT CO.: Martin (SD). GREGORY CO.: Bonesteel. HARDING CO.: \*Buffalo (all three in Halverson et al. 1976). CORSON CO.: Walker (SD).

*Formica ciliata* Mayr — HARDING CO.: \*North Cave Hills.

*Formica criniventris* Wheeler — HARDING CO.: \*North Cave Hills. PENNINGTON CO.: \*Hill City.

*Formica dakotensis* Emery — CLAY CO.: Vermillion (SD). GREGORY CO.: Bonesteel (SD). JACKSON CO.: Cottonwood (SD). PENNINGTON CO.: Hill City (E); \*4 mi S of Hill City.

*Formica fusca* Linnaeus — BROOKINGS CO.: Hendricks Lake (S); Volga (SD). CLAY CO.: Vermillion (SD). HARDING CO.: \*North Cave Hills. HUGHES CO.: Pierre (SD). JONES CO.: Capa (SD). LAWRENCE CO.: Whitewood (SD); Rough Rock Rd. (SD); Savoy (SD); 14 mi S of Spearfish (SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: Edelweiss Road (SD); Hill City (E); \*4 mmi S of Hill City; \*Quinn Table (3-2S-14E). YANKTON CO.: Yankton (SD).

*Formica haemorrhoidalis* Emery — BUTTE CO.: \*7 mi E Belle Fourche. PENNINGTON CO.: Hill City (E); \*3-1S-14E; \*5 mi NW of Hill City.

*Formica hewitti* Wheeler — LAWRENCE CO.: \*Terry Peak (summit 7000 ft).

*Formica laeviceps* Creighton — HARDING CO.: \*North Cave Hills; \*South Cave Hills.

*Formica lasioides* Emery — BENNETT CO.: Martin (SD). BROOKINGS CO.: Brookings (S, SD); Hendricks Lake (SD). CLAY CO.: Vermillion (S). CORSON CO.: Walker (SD). DEWEY CO.: Eagle Butte (SD). FALL RIVER CO.: Hot Springs (S, SD). HAAKON CO.: Philip (SD). HAMLIN CO.: Lake Poinsett (SD). HARDING CO.: \*North Cave Hills; \*Table Peak. HUGHES CO.: Canning (SD). HYDE CO.: Highmore (SD). JACKSON CO.: Badlands (SD); Cottonwood (SD); Interior (SD). LAWRENCE CO.: Lead (SD); Whitewood (SD); 12 mi W of Spearfish (SD); \*22-6N-2E. LYMAN CO.: Presho (SD). MINNEHAHA CO.: Crooks (SD). PENNINGTON CO.: Badlands (SD); Hill City (E); \*Moonehine Gulch Campground (2N-3E); Wall (SD). ROBERTS CO.: Sisseton (SD).

*Formica montana* Emery (= *neocinerea* = *rutilans*) — BENNETT CO.: Martin (SD). BROOKINGS CO.: Brookings (S, SD); Hendricks Lake (SD). BROWN CO.: Groton (SD); Hecla (SD). CLAY CO.: Meckling (SD); Vermillion (S, SD). CODINGTON CO.: Florence (SD). CORSON CO.: McLaughlin (SD); Walker (SD). FALL RIVER CO.: Hot Springs (SD). HAAKON CO.: Philip (SD). HAMLIN CO.: Lake Poinsett (SD). HARDING CO.: Buffalo (SD); Reva (SD). HUGHES CO.: Canning (S); Pierre (SD). HYDE CO.: Highmore (SD). JACKSON CO.: Cottonwood (SD); Interior (SD). JONES CO.: Murdo (SD). LAWRENCE CO.: Engelwood (SD); Spearfish (SD). LINCOLN CO.: Sioux Falls (ND). PENNINGTON CO.: Wall (SD). ROBERTS CO.: Sisseton (SD). UNION CO.: Elk Point (SD).

*Formica neoclara* Emery — BENNETT CO.: Martin (SD). BUTTE CO.: Newell (SD); Spearfish (SD). CORSON CO.: McLaughlin (SD). FALL RIVER CO.: Hot Springs (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD). LAWRENCE CO.: Spearfish (SD); Whitewood (SD); \*22-6N-2E. PENNINGTON CO.: \*Keystone; Rapid Canyon (SD).

*Formica neogagates* Emery — BENNETT CO.: Martin (SD). BON HOMME CO.: Springfield (SD). BROOKINGS CO.: Brookings (S, SD); Oakwood Lake (S, SD). BROWN CO.: Groton (SD); Hecla (SD). BRULE CO.: Chamberlain (SD); Kimball (SD). BUTTE CO.: Newell (SD). CLAY CO.: Meckling (SD); Vermillion (SD). CORSON CO.: Walker (SD). DEWEY CO.: Eagle Butte (SD). FALL RIVER CO.: Hot Springs (SD). HAAKON CO.: Philip (SD). HAND CO.: Ree Heights (SD). HARDING CO.: Buffalo (SD); \*North Cave Hills; \*South Cave Hills; Reva (SD); \*Table Mt. HUGHES CO.: Canning (SD); Herreid (SD); Pierre (SD). HYDE CO.: Highmore (SD). JACKSON CO.: \*Cedar Pass; Cottonwood (SD); Interior (SD). JONES CO.: Capa (S, SD). LAWRENCE CO.: Spearfish (SD). LYMAN CO.: Kennebec (SD). MEADE CO.: 2 mi from Pennington Co. on Rt. 137 (SD). PENNINGTON CO.: Bear Gulch Campground (SD); Hill City (E); Pactola (SD); Wall (SD); \*12-4S-17E; \*Badlands Nat. Mon. (11-3S-17E); \*17-2S-16E. PERKINS CO.: Bison (SD). STANLEY CO.: Fort Pierre (SD). SULLY CO.: Onida (SD).

*Formica neorufibarbis* Emery — LAWRENCE CO.: Lead (SD); \*Terry Peak (summit 7000 ft). PENNINGTON CO.: Hill City (E); Pactola (SD).

*Formica obscuripes* Forel — BENNETT CO.: Martin (SD). BROOKINGS CO.: Brookings (S, SD). BRULE CO.: Chamberlain (SD). BUTTE CO.: Belle Fourche (SD); Newell (SD). CLAY CO.: Vermillion (SD). CORSON CO.: Walker (SD). GREGORY CO.: Bonesteel (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD); Redig (SD); \*South Cave Hills. JACKSON CO.: \*Cedar

Pass; Cottonwood (SD); Interior (SD); Wall (SD). JONES CO.: Capa (S, SD). LINCOLN CO.: Sioux Falls (ND). LYMAN CO.: Kennebec (SD). PENNINGTON CO.: Harney (SD); \*28-2S-16E. ROBERTS CO.: Sisseton (SD).

*Formica obscuriventris* Mayr — GRANT CO.: Big Stone City (S, SD). HARDING CO.: \*North Cave Hills. MINNEHAHA CO.: Crooks (SD).

*Formica obtusopilosa* Emery (= *munda*) — BRULE CO.: Chamberlain (SD). BUTTE CO.: \*8-11N-3E; Newell (S, SD). CLAY CO.: Meckling (SD). CUSTER CO.: \*5-4S-1E; \*19-3S-1E. DEWEY CO.: Eagle Butte (SD); Fox Ridge (SD). GREGORY CO.: Bonesteel (SD). HAAKON CO.: Philip (SD). HARDING CO.: Buffalo (SD); Redig (SD); Reva (SD). HUGHES CO.: Canning (SD). HYDE CO.: Highmore (SD). JACKSON CO.: Cottonwood (SD); Interior (SD). LYMAN CO.: Kennebec (SD). PENNINGTON CO.: \*Badlands Nat. Mon. (13-3S-17E); Wall (SD). PERKINS CO.: Bison (SD). POTTER CO.: Gettysburg (SD).

*Formica oreas* Wheeler — PENNINGTON CO.: \*17-2S-16E.

*Formica pallidefulva nitidiventris* Emery — BON HOMME CO.: Springfield (SD). BRULE CO.: Chamberlain (SD). CLAY CO.: Vermillion (SD). FALL RIVER CO.: \*4 mi W of Hot Springs. GREGORY CO.: Bonesteel (SD). JACKSON CO.: \*Cedar Pass. JONES CO.: Capa (S, SD). LAWRENCE CO.: Spearfish (SD); Whitewood (SD); \*22-6N-2E. PENNINGTON CO.: \*Hill City (E); \*4 mi S of Hill City; \*Quinn Table (3-2S-14E). UNION CO.: Elk Point (SD); 6 mi E Elk Point (SD).

*Formica puberula* Emery — BROOKINGS CO.: Hendricks Lake (S, SD). FALL RIVER CO.: Hot Springs (SD). JACKSON CO.: \*Cedar Pass. LAWRENCE CO.: \*Terry Peak (summit 7000 ft). PENNINGTON CO.: Hill City (E).

*Formica rubicunda* Emery — HARDING CO.: \*Table Mt. JONES CO.: Capa (S); Lake Mead (SD). UNION CO.: Elk Point (SD).

*Formica schaufussi* Mayr — YANKTON CO.: Yankton (SD).

*Formica spatulata* Buren — PENNINGTON CO.: \*17-2S-16E.

*Formica subnuda* Emery — CUSTER CO.: Pringle (SD). HARDING CO.: \*North Cave Hills. LAWRENCE CO.: \*Terry Peak (summit 7000 ft); \*Spearfish Canyon nr Cheyenne Crossing. LINCOLN CO.: Sioux Falls (ND). PENNINGTON CO.: \*Hill City; \*4 mi S of Hill City; \*Deerfield; \*33-1N-3E; \*34-1N-1E.

*Formica subsericea* Say — CUSTER CO.: Custer (S, SD). LAWRENCE CO.: Roughlock Falls (SD). PENNINGTON CO.: \*Hill City; \*4 mi S of Hill City.

*Formica ulkei* Emery — BROOKINGS CO.: Brookings (SD). LAWRENCE CO.: Lead (SD); Spearfish (SD). LINCOLN CO.: Canton (SD). PENNINGTON CO.: Hill City (E); \*4 mi S of Hill City; \*15 mi NW of Hill City.

*Polyergus breviceps* Emery — PENNINGTON CO.: Hill City (E); \*4 mi S of Hill City.

## INTERESTING SOUTH DAKOTA ANTS

**THATCHING ANTS.** Thatching ant mounds are conspicuous features of the grasslands. This is partly due to the size of the mound itself, but also to the fact that the vegetation around the nest is taller than that of the surrounding prairie. Most of the nest is underground, but it is surmounted by a dome-shaped thatch mound. A typical mound is about 25 inches (66 cm) in diameter and 12 inches (30 cm) high. It is constructed of twigs, grass blades, dried herbaceous stems or other slender bits of material assembled by the workers from neighboring vegetation. The thatching ants collected in South Dakota are *Formica haemorrhoidalis*, *F. obscuripes*, *F. obscuriventris*, and *F. oreas*.

**MOUND-BUILDERS.** The most common mound-builder is the harvester *Pogonomyrmex occidentalis*, which is distributed throughout the grasslands. A typical mound is conoidal or paraboloidal, 24 inches (60 cm) in basal diameter and 5 ½ inches (14 cm) high. It is composed of excavated soil and covered with a layer of fine gravel collected by the workers from the surface of the surround-



ing soil. A mound is rendered more conspicuous by a circular bare area that surrounds it. These areas average 5 ft (1.5 m) in diameter.

The other type of mound is made by *Formica ulkei* and is usually found in openings in forests. Most of the records in South Dakota are in the extreme western part of the state. These conoidal mounds are composed of excavated soil and covered by a thin crust of soil mixed with plant debris which has fallen onto the surface. The mounds are large; the largest we have seen was in North Dakota; the basal diameter was 117 inches (2.9 m) and the height 34 inches (85 cm). The mounds usually occur in clusters.

**OBLIGATORY SLAVE-MAKERS.** Obligatory slave-makers are incapable of performing any of the nest-functions and are therefore wholly dependent upon their slaves. The story of how they raid the nest of some species of *Formica* to get their slaves is fascinating but too long for this essay. The South Dakota slave-maker was *Polyergus brevideps*, and its slave was *Formica subsericea*.

**FACULTATIVE SLAVE-MAKERS.** These are in the genus *Formica* and they enslave other species of *Formica*. They are, however, capable of performing all necessary nest functions; hence they can, and often do, get along without slaves. The following species of this group have been taken in South Dakota: *F. obtusopilosa*, *puberula*, *rubicunda*, *subnuda* (with *Formica subsericea* as slaves).

**THE SAND-HILL ANT.** Few ants are limited to a particular kind of soil. *Formica bradleyi*, however, is found only in very sandy soil, where it nests at the base of pioneer grasses. An extensive study of this interesting species was published by Halverson et al. (1976).

**HARVESTING ANTS.** These ants collect seeds when they are abundant and store them in the nest to be consumed in times of scarcity. South Dakota harvesting species are *Pogonomyrmex occidentalis*, *Pheidole bicarinata*, *Pheidole pilifera*, and *Veromessor lobognathus*. This last-named species is (for us) the most interesting South Dakota ant. After arduous searching we finally found only three nests in only one locality, which is 22 mi west of Custer and  $\frac{3}{4}$  mi from the Wyoming boundary. For an account of the discovery see our 1965 and 1967 papers. Throughout its range it has been found only in the Pinyon-Juniper Biome.

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