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A Checklist of the Ants of Wyoming
(Hymenoptera: Formicidae)

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The history of myrmecology in Wyoming began when Forel described a new species, *obscuripes* in the genus *Formica* from Green River in 1886, four years before Wyoming Territory became a state. There was a long hiatus until 1932 when Cole cited ten records for *Pogonomyrmex occidentalis*. Since then a dozen authors have published one to many records each.

During the summers of 1957, 1958, 1961, 1963, 1964, 1965 and 1966, while we were still at the University of North Dakota (Grand Forks), we made a dozen field trips into Wyoming to observe and collect ants in 12 of the 23 counties and in Yellowstone National Park. These expeditions yielded a total of 168 records for 45 species (a record is a species in a locality).

We had hoped that someone would publish a list of the ants for the state, to which we could add our findings. It was 1976 before a list finally appeared under the authorship of Lavigne and Tepedino. It occupied 2 1/2 of the 51 pages of a "Checklist of the Insects of Wyoming. I. Hymenoptera." After eliminating the 23 "probable" species we counted 69 species for the state. For 30 of these species no locality was cited. For 9 only one locality was given. For the remaining 33 two or more localities were reported, many with and many without the names of the counties.

Eleven other authors added a few records in each of the papers cited below making a total of 57 records for 44 species. Wing added 7 records for 5 species of *Acanthomyops* by spots on maps. We picked up 2 additional species from Smith's Catalog; we counted only those which had "Wyo." in the range. Finally we are greatly indebted to Roy R. Snelling for sending us 67 additional records based on specimens in the Los An-

geles County Natural History Museum. From all of these sources we extracted a list of 92 ant species for the state of Wyoming.

The only type locality we have found for Wyoming: *Formica obscuripes* Forel 1886.

The Biomes of Wyoming

The eastern portion (approximately a third) of Wyoming is in the Grasslands Biome. In the southwestern corner the Red Desert is in the Cool Subdivision of the Desert Biome. The plains in the central and southwestern parts are mostly sagebrush steppe, which might be considered ecotone between the Grasslands and the Cool Desert. The mountainous areas are chiefly northwestern. The foothills and lower slopes should probably be in the Pinyon- Juniper Biome. The middle and upper slopes are in the Coniferous Forest Biome, while the higher peaks and crests are in the Alpine Biome.

Plan for the List

Subfamilies and genera are arranged, with a few exceptions, as in the Smithsonian Catalog (Smith 1979). The species in each genus are arranged alphabetically except in *Formica* where they are first divided into species-groups. The localities in which a species has been collected are grouped by counties, which are arranged alphabetically. The localities represented by our collecting are preceded by an asterisk. Those in the Lavigne-Tepedino list are followed by (LT). Records supplied by Snelling are designated by (LA). Others are followed by the name of the author and the year of publication of the article or book. Finally the elevation

above sea level is given wherever known. Yellowstone National Park is treated as the equivalent of a county.

Abbreviations and Symbols

CO. = county	Mt. = Mountain
Cr. = Creek	Mts. = Mountains
ft = feet	Nat. = National
For. = Forest	nr = near
Hwy. = Highway	NL = No locality cited
mi = miles	Pk. = Park
Mon. = Monument	R. = River.

Compass directions are represented by symbols N, E, S and W and various combinations thereof. It is understood that they are followed by the word "of", e.g. "6 mi SW Dayton" would be read aloud as "six miles southwest of Dayton." For localities not near any town we use the legal description. We recommend an American treatise on surveying or our 1963 book (p. 76-77). Take, for example, a locality in Crook County: 24-56N-65W; the complete legal description would read "section 26, Township 56 North, Range 65 West" which would be abbreviated to "sec. 26, T. 56 N., R. 65 W."; to save space we resort to extreme abbreviation 24-56N-65W.

The Ants of Wyoming

Subfamily Ponerinae

Ponera pennsylvanica Buckley. CROOK CO. *Devils Tower Nat. Mon.

Subfamily Myrmicinae

Myrmica americana Weber. ALBANY CO. Laramie (LT). CONVERSE CO. Glenrock (LT). CROOK CO. Devils Tower Nat. Mon. (LT); Sundance (LT). GOSHEN CO. Lingle (LT); Torrington (LT). NIOBRARA CO. NL (LT). PLATTE CO. Glenrock (LA); Gurnsey (LT).

Myrmica brevinodis Emery (= *incompleta*). ALBANY CO. Laramie (LT); Nash Fork in Snowy Range (LT). BIG HORN CO. *20-56N-92W and *-53N-89W in Big Horn Mts. 7700 ft. CARBON CO. Encampment (LT); Riverside (LT). FREMONT CO. Crowheart (LA). JOHNSON CO. 14 mi W Buffalo (LA). LARAMIE CO. Cheyenne (LT). PARK CO. *Beartooth Butte in Beartooth Mts. 8000 ft. SHERIDAN CO. S. Fork Inn (LA); Big Horn Nat. For. (Weber 1950). YELLOWSTONE NAT. PK. NL (Weber 1950); *Bunsen Peak 7200 ft; *Yellowstone R. at Otter Cr. 8000 ft.

Myrmica brevispinosa Wheeler. ALBANY CO. Laramie (LT). FREMONT CO. Riverton (LT). LARA-

MIE CO. Cheyenne (Weber 1950). PARK CO. *8 mi W Wapiti 7000 ft. PLATTE CO. Guernsey (LA); Hartville (LT). SWEETWATER CO. Green River (LT). UINTA CO. Evanston (Weber 1950). YELLOWSTONE NAT. PK. NL (Weber 1950).

Myrmica emeryana Forel. CROOK CO. *5 mi NW Sundance; Devils Tower Nat. Mon. (Weber 1948). NATRONA CO. *Casper Mt. 8000 ft. SHERIDAN CO. *6 mi NW Dayton in Big Horn Mts.; S. Fork Inn (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft.

Myrmica fracticornis Emery. ALBANY CO. Laramie (Weber 1948); Medicine Bow Nat. For. 9400 ft (Hoff 1957). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft. CARBON CO. *20 mi SE Saratoga in Medicine Bow Mts. FREMONT CO. Dubois (LT). NATRONA CO. *Casper Mt. 8000 ft. SHERIDAN CO. S. Fork Inn (LA). TETON CO. *U. S. Hwy. 89 nr Snake R. 3 mi S entrance to Yellowstone Nat. Pk. 7000 ft; 20 mi E Moran (LA). YELLOWSTONE NAT. PK. *Indian Creek Campground 7300 ft; *1 mi E Norris Junction 7400 ft.

Myrmica lobifrons Pergande. BIG HORN CO. *2 mi E Shell Cr. Bridge on U. S. Hwy. 14 in Big Horn Mts. 7400 ft. NATRONA CO. *Casper Mt 8000 ft.

Myrmica monticola Wheeler. ALBANY CO. Medicine Bow Nat. For. 8900 ft and 10,000 ft. (Hoff 1957).

Myrmica tahoensis Wheeler. NL (LT).

Manica hunteri (Wheeler). ALBANY CO. Laramie (Cole 1932). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft. CARBON CO. Rawlins (Cole 1932). CROOK CO. Sundance (Cole 1957); *5 mi NW Sundance 6400 ft. LARAMIE CO. Cheyenne (Cole 1932). NATRONA CO. *Casper Mt. 8000 ft and *9000 ft. PARK CO. *Clark's Fork of Yellowstone R. 15 mi SE Cooke City, Mont. SWEETWATER CO. Rock Springs (LT); Green River (Cole 1932). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk.; Grand Teton Nat. Pk. (LA). WASHAKIE CO. Ten Sleep (Cole 1932). YELLOWSTONE NAT. PK. *nr Grizzly Lake 7400 ft.

Manica mutica (Emery). BIG HORN CO. *4 mi W Shell Cr. Bridge on U. S. Hwy. 14 in Big Horn Mts. 5800 ft. LARAMIE CO. Cheyenne (LT). WASHAKIE CO. *Worland 4000 ft. YELLOWSTONE NAT. PK. *Gibbon Falls 7000 ft.

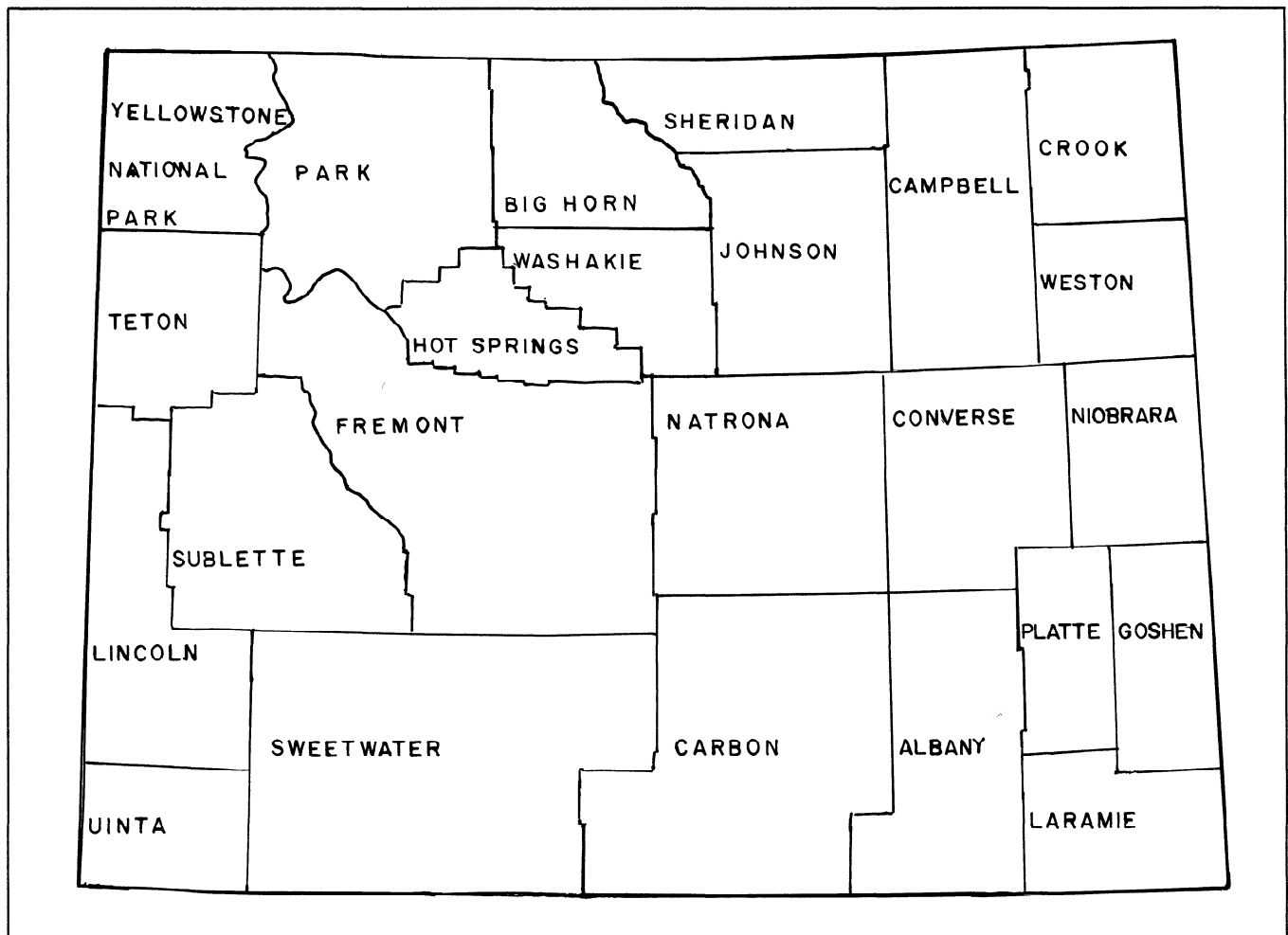


Figure 1. Counties of Wyoming.

Pogonomyrmex occidentalis (Cresson). State except NW 1/4 (LT). CONVERSE CO. Glenrock (LA). CROOK CO. *Devil's Tower Nat. Mon. (Bernstein 1980); *24-56N-65W. HOT SPRINGS CO. *10 mi NW Thermopolis; *Casper 5100 ft; *Hells Half Acre. SUBLETTE CO. Fremont Lake (LA).

Pogonomyrmex owyheeii Cole. NW 1/4 of state (LT). PARK CO. *14 mi W Wapiti 7000 ft.

Aphaenogaster occidentalis Emery (= *subterranea*). CROOK CO. *Devils Tower Nat. Mon.; *Sundance. HOT SPRINGS CO. *Wind River Canyon nr Thermopolis. SHERIDAN CO. *6 mi W Dayton on U. S. Hwy. 14 in Big Horn Mts. WASHAKIE CO. *10 mi NE Ten Sleep in Big Horn Mts. 6900 ft.

Aphaenogaster rudis (Emery). NL (LT). CROOK CO. *Devils Tower Nat. Mon. (Bernstein 1980).

Pheidole bicarinata Mayr. NL (LT). CROOK CO. Devils Tower Nat. Mon. (LA). PLATTE CO. Guernsey (LA).

Pheidole pilifera coloradensis Emery. JOHNSON CO. Buffalo (LT). NIOBRARA CO. Lusk (LT). PLATTE CO. Glendo (LT). WESTON CO. Four Corners (LT).

Crematogaster cerasi (Fitch) (= *lineolata*). NL (LT).

Monomorium minimum (Buckley). CONVERSE CO. Glenrock (LT). NIOBRARA CO. Manville (LT). PLATTE CO. NL (LT); Guernsey & Hartville (Lavigne 1966).

Monomorium pharaonis (Linnaeus). NL (LT). *Solenopsis molesta* (Say). ALBANY CO. Medicine Bow Nat. For. (LT). CONVERSE CO. Glenrock (LT). CROOK CO. Devils Tower Nat. Mon. (LA). NATRONA CO. *Casper Mt. 8000 ft. PLATTE CO. Cottonwood Cr. in Laramie Range (LT);

Guernsey (LA). TETON CO. Targhee Nat. For. (LT). WASHAKIE CO. *10 mi NE Ten Sleep in Big Horn Mts. 6900 ft. WESTON CO. Four Corners (LT).

Leptothorax carinatus Cole. ALBANY CO. Laramie (LT); Snowy Range Mts. (LT). CONVERSE CO. Glenrock (LT). GOSHEN CO. NL (LT). LARAMIE CO. NL (LT). NIOBRARA CO. Manville (LT). PLATTE CO. Wheatland (LT).

Leptothorax crassipilis Wheeler. CROOK CO. Devils Tower Nat. Mon. (LA).

Leptothorax furunculus Wheeler. NL (LT).

Leptothorax hirticornis Emery. YELLOWSTONE NAT. PK. NL (Buschinger 1979).

Leptothorax muscorum (Nylander) (= *canadensis*). ALBANY CO. Laramie (LT); Medicine Bow Nat. For. 8900 ft, 9400 ft and 10,000 ft (Hoff 1957). BIG HORN CO. *20-56N-92W in Big Horn Mts. CROOK CO. *Devils Tower Nat. Mon. SHERIDAN CO. *6 mi E Burgess Junction on U. S. Hwy. 14 in Big Horn Mts. 8000 ft; S. Fork Inn (LA). TETON CO. Grand Teton Nat. Pk. (LA); 20 mi E Moran (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft; *nr Grizzly Lake 7400 ft.

Leptothorax rugatulus Emery. NL (LT). CROOK CO. *Devils Tower Nat. Mon. (Bernstein 1980). WESTON CO. *8 mi N Newcastle.

Leptothorax tricarinatus Emery. NL (Smith 1979).

Subfamily Dolichoderinae

Liometopum luctuosum Wheeler. NL (Smith 1979.)

Forelius pruinosus (Roger). NL (LT). CROOK CO. *Devils Tower Nat. Mon.

Conomyrma insana (Buckley) (= *Dorymyrmex pyramicus*). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). FREMONT CO. Shoshoni (LT). GOSHEN CO. Lingle (LT); Torrington (LT). LARAMIE CO. NL (LT). PLATTE CO. Chugwater (LT); Bench (LT); Guernsey (LT); Wheatland (LT).

Tapinoma sessile (Say). ALBANY CO. Laramie (LT); Medicine Bow Nat. For. 10,000 ft (Hoff 1957). BIG HORN CO. *2 mi E Shell Cr. Bridge on U. S. Hwy. 14 in Big Horn Mts. 7400 ft. CAMPBELL CO. Gillette (LT). CARBON CO. Encampment (LT); Como Bluffs (LT); Saratoga (LT). CONVERSE CO. Glenrock (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). FREMONT CO. Togwotee Pass (LT); Dubois (LT). LARAMIE CO. NL (LT). NATRONA CO. *Casper Mt.

8000 ft. NIOBRARA CO. Lusk (LT); Manville (LT). PARK CO. Cody (LT). SHERIDAN CO. *9 mi W Dayton on U. S. Hwy. 14 in Big Horn Mts. TETON CO. Targhee Nat. For. (LT); Rogers Point (LT); 20 mi E Moran (LA). WASHAKIE CO. *10 mi NE Ten Sleep 6900 ft. YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft.

Subfamily Formicinae

Brachymyrmex depilis Emery. NL (LT). CROOK CO. *5 mi NW Sundance 6400 ft.

Camponotus herculeanus (Linnaeus). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft. NATRONA CO. *Casper Mt. 8000 ft. PARK CO. *Beartooth Butte in Beartooth Mts. 7000 ft and 8400 ft; *Clark's Fork on Yellowstone R., 15 mi SE Cooke City, Mont. YELLOWSTONE NAT. PK. *Indian Creek Campground 7300 ft; *Wraith Falls 6500 ft.

Camponotus laevigatus (F. Smith). NL (LT). SHERIDAN CO. *9 mi W Dayton on U. S. Hwy. 14 in Big Horn Mts.

Camponotus modoc Wheeler. NL (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). NATRONA CO. *Casper Mt. 8000 ft.

Camponotus noveboracensis (Fitch). NL (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980).

Camponotus vicinus Mayr. ALBANY CO. Laramie (LT). BIG HORN CO. E of Kane Hwy. (LT); Fivesprings (LT). CARBON CO. Dixon (LT); Encampment (LT). CONVERSE CO. Glenbrook (LA). CROOK CO. *Devils Tower Nat. Mon. GOSHEN CO. Torrington (LT). NIOBRARA CO. NL (LT). PARK CO. *Clark's Fork on Yellowstone R., 15 mi SE Cooke City, Mont. PLATTE CO. Wheatland (LT). SHERIDAN CO. *6 mi and *9 mi W Dayton in Big Horn Mts. WASHAKIE CO. *10 mi NE Ten Sleep in Big Horn Mts. 6900 ft.

Lasius alienus (Foerster). ALBANY CO. Centennial (LT). CARBON CO. Encampment (LT). CONVERSE CO. Douglas (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). JOHNSON CO. Bufallo (LT); Kaycee (LT). NATRONA CO. *Casper Mt. 8000 ft and 9000 ft. PARK CO. *Clark's Fork on Yellowstone R., 15 mi SE Cooke City, Mont. SHERIDAN CO. *6 mi E Burgess Junction on U. S. Hwy. 14 in Big Horn Mts. 8000 ft. SUBLETTE CO. Junction Hwys. 191 & 189 (LT). TETON CO. Targhee Nat. For. (LT); Rogers Point (LT). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft.

- Lasius crypticus* Wilson. CARBON CO. Shirley Basin (LT). CROOK CO. *Devils Tower Nat. Mon.; *26-56N-65W. FREMONT CO. Pavilion (LT). PARK CO. *14 mi W Wapiti. WASHAKIE CO. *10 mi NE Ten Sleep in Big Horn Mts 6900 ft. YELLOWSTONE NAT. PK. Madison Junction (Wilson 1955).
- Lasius fallax* Wilson. TETON CO. 20 mi E Moran (Wilson 1955); Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft.
- Lasius flavus* (Fabricius) (= *nearcticus*). NL (LT). BIG HORN CO. *2 mi E Shell Cr. Bridge on U. S. Hwy. 14 in Big Horn Mts. 7400 ft. CROOK CO. *Devils Tower Nat. Mon. (Wilson 1955); *5 mi NW Sundance 6400 ft.
- Lasius neoniger* Emery. ALBANY CO. Medicine Bow (LT). CROOK CO. Sundance (LT). LARAMIE CO. Cheyenne (LT). LINCOLN CO. Kemmerer (LT). PLATTE CO. Guernsey (Wilson 1955).
- Lasius sitiens* Wilson. PARK CO. *14 mi W Wapiti 7000 ft.
- Lasius sitkaensis* Pergande (= *pallitarsis*). ALBANY CO. Medicine Bow Nat. For. 9400 ft (Hoff 1957). BIG HORN CO. *20-56N-92W in Big Horn Mts. CONVERSE CO. Glenrock (LA). SHERIDAN CO. *9 mi W Dayton on U. S. Hwy. 14. SUBLETTE CO. Fremont Lake (LA). YELLOWSTONE NAT. PK. *Isa Lake 8300 ft.
- Lasius subumbratus* Viereck. CROOK CO. Devils Tower Nat. Mon. (Wilson 1955). SHERIDAN CO. *6 mi E Burgess Junction in Big Horn Mts. 8000 ft. TETON CO. Jenny Lake in Grand Teton Nat. Pk. (Wilson 1955). YELLOWSTONE NAT. PK. *Firehole R. 7600 ft.
- Lasius umbratus* (Nylander). NL (LT).
- Acanthomyops coloradensis* (Wheeler). NL (Wing 1968). NIOBRARA CO. NL (LT).
- Acanthomyops interjectus* (Mayr). CROOK CO. NL (Wing 1968). Devils Tower Nat. Mon. (LA).
- Acanthomyops latipes* (Walsh). NL (Wing 1968). CROOK CO. *Devils Tower Nat. Mon. FREMONT CO. Shoshoni (LA). PLATTE CO. Wheatland (LA).
- Acanthomyops murphyi* (Forel). PLATTE CO. Wheatland (LT).
- Acanthomyops occidentalis* (Wheeler). NL (Wing 1968).
- Acanthomyops subglaber* (Emery). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980).
- Species-Group *Neogagates* of *Formica***
- Formica bradleyi* Wheeler. CARBON CO. Rawlins (LA).
- GOSHEN CO. Lingle 4000 ft (LT); Torrington 4000 ft (LT). JOHNSON CO. Buffalo 4500 ft (LT).
- Formica lasioides* Emery. ALBANY CO. NL (LT). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft (slave of *F. puberula*); *2 mi E Shell Cr. Bridge in Big Horn Mts. 7400 ft; *Fivesprings Picnic Area (-56N-93W) 7200 ft. LARAMIE CO. Junction of Hwys. 187 & 191 (LT). NIOBRARA CO. Manville (LT). PARK CO. *14 mi W Wapiti 7000 ft. TETON CO. Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft; *Tower Falls 6600 ft; *1 mi E Norris Junction 7400 ft.
- Formica limata* Wheeler. CROOK CO. *Devils Tower Nat. Mon.
- Formica manni* Wheeler. SWEETWATER CO. Green River (LT).
- Formica neogagates* Emery. ALBANY CO. Pole Mt. (LT). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft. CAMPBELL CO. NL (LT). CONVERSE CO. Glenrock (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). GOSHEN CO. Lingle (LT). HOT SPRINGS CO. *Wind River Canyon nr Thermopolis. LARAMIE CO. NL (LT). NIOBRARA CO. Manville (LT). PLATTE CO. Chugwater (LT). SHERIDAN CO. NL (LT). SUBLETTE CO. Bondurant (LT). SWEETWATER CO. Green River (LT). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. 7000 ft. WASHAKIE CO. *10 mi NE Ten Sleep (slave of *F. rubicunda*).
- Formica perpilosa* Wheeler. NL (LT).
- Species-Group *Pallidelfulva* of *Formica***
- Formica pallidelfulva nitidiventris* Emery. NL (LT). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980).
- Species-Group *Fusca* of *Formica***
- Formica altipetens* Wheeler. PARK CO. *Beartooth Butte in Beartooth Mts. 8400 ft. SUBLETTE CO. Bondurant (LT); 28 mi SE Jackson (LA). SWEETWATER CO. Farson (LA). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. 7000 ft. YELLOWSTONE NAT. PK. *Yellowstone R. at Otter Cr. 8000 ft; *Yellowstone R. at Elk Antler Cr. 7700 ft.
- Formica argentea* Wheeler. ALBANY CO. *10 mi E Laramie (slave of *F. puberula*). CROOK CO. *Devils Tower Nat. Mon. PLATTE CO.

Guernsey (LT). SHERIDAN CO. *6 mi E Burgess Junction on U. S. Hwy. 14 in Big Horn Mts. 8000 ft (slave of *F. puberula*). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. 7000 ft (slave of *Polyergus breviceps*). WASHAKIE CO. *10 mi NE Ten Sleep 6900 ft.

Formica fusca Linnaeus. ALBANY CO. Centennial (LT); Laramie (LT); Nash Fork in Snowy Range (LT). CAMPBELL CO. NL (LT). CARBON CO. *20 mi SE Saratoga in Medicine Bow Mts. CONVERSE CO. Glenrock (LA). CROOK CO. Devils Tower Nat. Mon. (LA). FREMONT CO. Dubois (LT); Togwotee Pass (LA). GOSHEN CO. Huntley (LT); Torrington (LT). JOHNSON CO. 5 mi W Buffalo (LA). LARAMIE CO. Burns (LT). NATRONA CO. *Casper Mt. 8000 ft. NIOBRARA CO. Lusk (LT); Manville (LT). PLATTE CO. Wheatland (LT). SHERIDAN CO. *7 mi E Burgess Junction in Big Horn Mts. SUBLETTE CO. Fremont Lake (LA). SWEETWATER CO. *Green River (LT); Rock Springs (LT). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk; Grand Teton Nat. Pk. (LA); Jackson (LA); 12 mi SE Jackson (LA); 4 mi W Jackson (LA). YELLOWSTONE NAT. PK. NL (LT).

Formica hewitti Wheeler. NL (LT). SHERIDAN CO. *13 mi W Dayton on U. S. Hwy. 14 in Big Horn Mts. TETON CO. 20 mi E Moran Junction (LA); Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft (slave of *Polyergus breviceps*); *Dunraven Pass 8800 ft.

Formica montana Emery. ALBANY CO. Medicine Bow Nat. For. 9400 ft (Hoff 1957). BIG HORN CO. *Granite Pass in Big Horn Mts. 8950 ft. CARBON CO. Rawlins (LA). CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980). JOHNSON CO. *35-50N-84W. SHERIDAN CO. *Baldy Pass 9000 ft.

Formica neoclara Emery. CROOK CO. Devils Tower Nat. Mon. (LT). LINCOLN CO. Smoot (LT). NATRONA CO. Casper (LA). PLATTE CO. NL (LT). SWEETWATER CO. Green River (LT). TETON CO. Moran Junction (LT); Grand Teton Nat. Pk. (LA).

Formica neorufibarbis Emery. ALBANY CO. *8 mi NW Centennial 10,800 ft; Centennial (LT); Snowy Range Mts. (LT); Medicine Bow Nat. For. (LT); Libby Flats (LT). BIG HORN CO. *20-56N-92W in Big Horn Mts. CARBON CO. *20 mi SE Saratoga in Medicine Bow Mts. CROOK CO.

Devils Tower Nat. Mon. (Bernstein 1980). NATRONA CO. *Casper Mt. 8000 ft. PARK CO. *Beartooth Butte in Beartooth Mts. 8400 ft; *Beartooth Pass in Beartooth Mts. 10,940 ft. SHERIDAN CO. *13 mi W Dayton in Big Horn Mts.; S. Fork Inn (LA). SUBLETTE CO. Fremont Lake (LA); 8 mi SE Bondurant (LA); 14 mi E Bondurant (LA). TETON CO. 12 mi SE Jackson (LA); 9 mi W Jackson; Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Lewis R. 7 mi N of S entrance 7800 ft; *Dunraven Pass 8850 ft; Old Faithful (LA).

Formica subpolita Mayr. NL (LT).

Formica subsericea Say. ALBANY CO. Medicine Bow Nat. For. 9400 ft and 10,000 ft (Hoff 1957). PARK CO. *Clark's Fork of Yellowstone R., 15 mi SE Cooke City, Mont. YELLOWSTONE NAT. PK. *Yellowstone R. at Otter Cr. 8000 ft.

Species-Group *Exsecta* of *Formica*

Formica opaciventris Emery. TETON CO. Moose Island in Grand Teton Nat. Pk. (LT and Scherba 1961). YELLOWSTONE NAT. PK. *Yellowstone R. at Otter Cr. 8000 ft.

Formica ulkei Emery. TETON CO. Grand Teton Nat. Pk. (LA).

Species-Group *Rufa* of *Formica* (including *Microgyna*)

Formica ciliata Mayr. NL (LT).

Formica comata Wheeler. NL (LT).

Formica criniventris Wheeler. NL (LT). BIG HORN CO. Manderson (LA). SWEETWATER CO. Farson (LA).

Formica dakotensis Emery. BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft.

Formica densiventris Viereck. CROOK CO. *Sundance. TETON CO. Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Lewis R. 7 mi N of S entrance 7800 ft.

Formica haemorrhoidalis Emery. GOSHEN CO. NL (LT). PLATTE CO. Guernsey (LT); Wheatland (LT). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. 7000 ft; Grand Teton Nat. Pk. (LA).

Formica microgyna Wheeler. NL (LT). TETON CO. 20 mi E Moran (LA).

Formica obscuripes Forel. ALBANY CO. Snowy Range Mts. (LT); Laramie (LT). CAMPBELL CO. NL (LT). CARBON CO. Encampment (LT). CONVERSE CO. Glenrock (LA). CROOK CO. *24-

56N-65W; *4-56N-65W; Devils Tower Nat. Mon. (Bernstein 1980). FREMONT CO. Dubois (LT). GOSHEN CO. Torrington (LT). JOHNSON CO. NL (LT). LINCOLN CO. Cokeville (LT); Kemmerer (LT). NIOBRARA CO. NL (LT). PARK CO. *Clark's Fork of Yellowstone R., 15 mi SE Cooke City, Mont. SUBLETTE CO. Fremont Lake (LA). SWEETWATER CO. Creston (LT). TETON CO. Jackson (LT). WASHAKIE CO. Ten Sleep (LT); Wigwam (LT).

Formica obscuriventris Mayr. CROOK CO. NL (LT). Devils Tower Nat. Mon. (Creighton 1940). YELLOWSTONE NAT. PK. *Indian Creek Campground 7300 ft.

Formica oreas Wheeler. ALBANY CO. *3 mi NW Centennial 8600 ft. CARSON CO. Shirley Basin (LA). CROOK CO. Devils Tower Nat. Mon. (LA). GOSHEN CO. NL (LT). NIOBRARA CO. NL (LT). PARK CO. Powell (LT); *Beartooth Butte in Beartooth Mts. 7000 ft; *14 mi W Wapiti 7000 ft. YELLOWSTONE NAT. PK. *Yellowstone R. at Elk Antler Cr. 7700 ft.

Formica planipilis Creighton. NL (LT). TETON CO. *U. S. Hwy. 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. YELLOWSTONE NAT. PK. *Yellowstone R. at Elk Antler Cr. 7700 ft.

Formica spatulata Buren. CROOK CO. Devils Tower Nat. Mon. (Bernstein 1980).

Formica subnitens Creighton. NL (LT). TETON CO. Grand Teton Nat. Pk. (LA).

Formica whympersi Forel. ALBANY CO. Medicine Bow Nat. For. 10,000 ft (Hoff 1957). NATRONA CO. *Casper Mt. 8000 ft.

Species-Group *Sanguinea* of *Formica*

Formica gynocrates Snelling & Buren. PLATTE CO. Wheatland (Snelling and Buren 1985).

Formica obtusopilosa Emery. ALBANY CO. NL (LT). BIG HORN CO. Manderson (LA). CARBON CO. Dixon (LT); Rawlins (LA). CONVERSE CO. Glenrock (LT). CROOK CO. Aladdin (LT); *24-56N-65W. GOSHEN CO. Lingle (LT). HOT SPRINGS CO. *10 mi N Thermopolis. JOHNSON CO. Kaycee (LT). LARAMIE CO. NL (LT). NATRONA CO. Casper (LT). NIOBRARA CO. Lusk (LT); Manville (LT). PLATTE CO. Guernsey (Lavigne 1966); Hartville (Lavigne 1966); Wheatland (LT). SHERIDAN CO. Sheridan (LT). SUBLETTE CO. Pinedale (LT). SWEETWATER CO. Eden (LT); Green River (LT).

Formica puberula Emery. ALBANY CO. Medicine Bow Nat. For. 9400 ft (Hoff 1957); *10 mi E Laramie (slave: *F. argentea*). BIG HORN CO. *Meadowlark Lake in Big Horn Mts. 8500 ft (slave: *F. lasioides*). FREMONT CO. Dubois (LA). LINCOLN CO. 20 mi S Jackson (LA). SHERIDAN CO. *6 mi E Burgess Junction in Big Horn Mts. 8500 ft (slave: *F. argentea*). TETON CO. Grand Teton Nat. Pk. (LA); 20 mi E Moran (LA). YELLOWSTONE NAT. PK. Madison Junction 6300 ft (LA).

Formica rubicunda Emery. CARBON CO. 16 mi N Medicine Bow (LA). WASHAKIE CO. *10 mi NE Ten Sleep 6900 ft (slave: *F. neogagates*).

Formica subnuda Emery. ALBANY CO. Medicine Bow Nat. For. 9400 ft (Hoff 1957). SHERIDAN CO. *6 mi E Burgess Junction in Big Horn Mts. 8000 ft. TETON CO. 20 mi E Moran (LA); Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Indian Cr. Campground 7300 ft; *Wraith Falls 6500 ft; *2 1/2 mi SW of NE entrance 7200 ft; *1 mi E Norris Junction 7400 ft.

Formica wheeleri Creighton. NL (LT).

Polyergus breviceps Emery. NL (LT). LINCOLN CO. 20 mi S Jackson (LA). TETON CO. Moran (Wheeler 1968); *U. S. Hwy 89 nr Snake R., 3 mi S entrance to Yellowstone Nat. Pk. (slave: *Formica argentea*); Grand Teton Nat. Pk. (LA). YELLOWSTONE NAT. PK. *Wraith Falls 6500 ft (slave: *Formica hewitti*).

Interesting Wyoming Ants

Thatching Ants. Thatching ant mounds are conspicuous feature of the grasslands. This is partly due to the size of the mound itself, but also to the fact that 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 any other slender bits of material, assembled by the workers from neighboring vegetation. The thatching ants collected in Wyoming are *Formica haemorrhoidalis*, *F. obscuripes*, *F. obscuriventris* and *F. oreas*.

Mound-builders. The most common mound-builder is the harvester *Pogonomyrmex occidentalis*, which is widely distributed throughout the grasslands and Cool Desert. A typical mound is conoidal or paraboloidal, 24 inches (60 cm) in basal diameter and 5 1/2 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 surrounding soil. A mound is rendered more conspicuous by a circular bare area which surrounds it. These areas average 5 ft (1.5 m) in diameter. The mounds of *P. owyheeii* are similar. The other type of mound is made by *Formica opaciventris*, for which we have found only one record, which was thoroughly studied by Scherba (1961):—"The study area is located on Moose Island, a small island one-half by one-quarter mile in size, located in an ox-bow of the Snake River, two miles east of Jackson Lake." The nests of this species were in "low conical earthen mounds, varying in size up to a basal diameter of 78 inches and a maximum height of 24 inches at the mound apex. These mounds are asymmetrical and have a long, broad slope oriented toward the east, southeast or rarely south." The mounds had a crust of compact soil covered by a thin layer of freshly mined soil particles. Scattered lightly and irregularly over this was a covering of plant debris. It is characteristic of the *exsecta* species-group that the mounds are in clusters; Scherba found on this small island approximately 400 mounds "distributed throughout most of the meadow with but few mounds along the pine forest and aspen ecotones and none in the swales."

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 Wyoming slavemaker was *Polyergus breviceps* and its slaves were *Formica argentea* and *F. hewitti*.

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 species that have been taken in Wyoming are the six species in the *sanguinea* species-group listed above. The slaves reported in the state were *Formica argentea*, *F. lasioides* and *F. neogagates*.

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 abundant and store them in the nest to be consumed in times of scarcity. Wyoming harvesting species are *Pogonomyrmex occidentalis*, *P. owyheeii*, *Pheidole bicarinata* and *Ph. pilifera*.

The Genus *Manica*. For us the most interesting Wyoming ants are in this genus: *Manica mutica* 5 nests in 3 localities, 4060-7000 ft; *M. hunteri* 30 nests in 8 localities 6400-9000 ft. The following account is adapted from our book on Nevada ants (1986), which was based on our intensive 1970 study.

In North America the Holarctic genus *Manica* (6 species) is strictly western. The four American species are all found west of the 100th Meridian and north of the 34th Parallel. *M. mutica* is the most xerophilous and occurs in the greatest variety of habitats (usually unshaded), in the greatest geographical range and in the greatest elevational range (1100- 8600 ft). *M. hunteri* is a montane species, 2200-9000 ft, with a much smaller range. It requires moderately moist soil and its typical habitat is an opening in a coniferous forest. The distribution is sporadic, but a species can be locally very abundant as we found them on Casper Mountain and in the Big Horn Mountains.

The basic nest structure is probably the same in both species: a reticulum of chambers and galleries connected with chambers under stones or opening to the surface by holes in one or more small craters constructed of excavated soil; but great plasticity is manifest in variations on the basic plan.

The nature of the food of *Manica* is an unsolved mystery. Our latest hypothesis is that *Manica* feeds on ants of other genera. Our tenuous evidence consists of three bits: (1) In Montana we found a *Formica fusca* mound which contained in one half *Formica* and in the other half *Manica hunteri*. (2) In Wyoming we found a *F. fusca* mound which was occupied only by *M. hunteri*. (3) Their intrageneric tolerance contrasted with their hostility toward other genera.

The ants of this genus are not aggressive, but when the nest is disturbed the workers sting promptly and effectively. The effect of the sting has been reported to be very painful, but we found it only mildly so. The genus is unusual in that workers show no hostility toward workers of another colony of the same species or even of another species of *Manica*, but they are murderously hostile toward workers of other genera.

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