NORTH DAKOTA ANTS UPDATED

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It has been 14 years since the publication of our book on "The Ants of North Dakota" (1963). During those years enough important changes have been made in ant classification and nomenclature to warrant a revised edition, but inflated costs and small demand render such a publication beyond our means. We have therefore printed this supplement in a format that can either be bound to or inserted in appropriate places into the original.

These revisionary notes are based on essentially the same material. Very few new collections have been added.

Page 77. *INSERT* as paragraph 5: – To aid in understanding the localities we add the following list of named places – BILLINGS COUNTY – Peaceful Valley Ranch: 12-140-102; Roosevelt National Memorial Park, South Unit: portions of T. 140 & 141 N., R. 100 to 102 W. BOTTINEAU COUNTY – Lake Metigoshe State Park: 36-164-75. CAVALIER and PEMBINA COUNTIES – Pembina Mountains (Wheeler and Wheeler 1963: 307). This escarpment is most prominent along the Cavalier-Pembina County boundary; covering portions of T. 159 to 164 N., R. 55 to 59 W. GOLDEN VALLEY COUNTY – Sentinel Buttes: These are high buttes southeast of the town of Sentinel Butte; they occupy portions of 5, 6, 7 & 8-139-104. GRAND FORKS COUNTY – Collections labelled "Arvilla" are from Turtle River State Park (36-152-54); Biology Area near Inkster (recently called "Forest River Biology Area"): 11 & 14-154-55; early collections labelled "Emerado" are from Oakville Prairie Biology Area (9-151-52); Greenwood Slough (or Lake): 25 & 36-151-50. McKENZIE COUNTY – Roosevelt National Memorial Park, North Unit: small portions of T. 147 & 148 N., R. 99 & 100 W. SLOPE COUNTY – Black Butte: 24-134-102; Burning Coal Seam: 12-136-102; Pretty Butte: 35-134-106.

Page 77. As last paragraph *INSERT:* – Other ecologically interesting areas are sand dunes. We have collections from the following counties: Adams, Billings, Bowman, Cass, Emmons, Grant, McHenry, Morton, Ramsey, Ransom, Renville, Richland, Sioux, Slope and Stark. The two largest areas are along the Souris (= Mouse) River in McHenry County (portions of T. 155 and 156 N., R. 76 & 77 W. to T. 158 & 159 N., R. 76 & 77 W.) and along the Ransom-Richland County line (T. 133 to 135 N., R. 51 to 54 W.) near the Wild Rice River. Sand dunes in North Dakota are important myrmecologically due to the presence of *Formica bradleyi*, one of the few ants which seem to be limited by soil type.

Page 78-79. *REVISION* of TAXONOMIC LIST:–

Under Genus CREMATOGASTER Lund *DELETE* Subgenus ACROCOELIA Mayr. *CHANGE lineolata* (Say) to *cerasi* (Fitch).

CHANGE Genus DORYMYRMEX Fo rel to Genus CONOMYRMA Forel and in the next line *CHANGE pyramicus* (Roger) to *insana* (Buckley).

DELETE Genus PARATRECHINA Motschulsky and in the next line *CHANGE* Sub genus to Genus.

Under Subgenus CHTHONOLASIUS Ruzsky *ADD speculiventris* Emery.

Under Genus ACANTHOMYOPS Mayr *DELETE claviger* (Roger) and *parvulus* (M.R. Smith) and *ADD coloradensis* Wheeler and *occidentalis* Wheeler.

Under Genus FORMICA Linnaeus *CHANGE* Subgenus PROFORMICA Ruzsky to Species belonging to the *neogagates* group. *CHANGE* Subgenus RAPTIFORMICA Forel to Species belonging to the *sanguinea* group. *DELETE* Subgenus FORMICA Linnaeus. *ADD* to *rufa* group *haemorrhoidalis* Emery. *DELETE* from *fusca* group *cinerea lepida* Wheeler, —— *montana* Emery and *marcida* Wheeler and *ADD argentea* Wheeler, *hewitti* Wheeler, *montana* Emery and *subsericea* Say.

Under Genus POLYERGUS Latreille *CHANGE rufescens* Latreille to *breviceps* Emery.

Page 80. *REVISION* of TABLE I: – *CHANGE Formica fusca* from 541 to 81, *F. neoclara* from 96 to 116, *Acanthomyops subglaber* from 7 to 26. *A. murphyi* from 2 to 4. *ADD Lasius speculiventris* 1, *Acanthomyops coloradensis* 63, *A. occidentalis* 11, *Formica argentea* 108, *F. hewitti* 1, *F. haemorrhoidalis* 36, *F. montana* 114, *F. subsericea* 345. *DELETE Acanthomyops claviger, A. parvulus, Formica cinerea* and *F. marcida.*

Page 81. *REVISION* of TABLE II: – *CHANGE* Formica to 34 species. *CHANGE* Lasius to 8 species. *CHANGE* TOTAL to 87 species. *REVISION* of TABLE III: – *CHANGE* Formicinae to 58 species. *CHANGE* TOTAL to 87 species. Paragraph 1 line 1 *CHANGE* 82 to 86 and 409 to 511.

Page 82. *DELETE* TABLES IV and V.

Page 83. *REVISION* of TABLE VI: –

CHANGE Acanthomyops claviger to *A. coloradensis*, no excavated material 2, craters 2, under rocks 43, misc. covering objects 4.

CHANGE Acanthomyops interjectus to earthen mounds 6, under rocks 4, under wood 1, in leaf mold 1.

CHANGE Acanthomyops latipes to earthen mound 1, under rocks 11, misc. 1.

ADD Acanthomyops occidentalis earthen mound 1, under rock 1, under cow dung 1.

CHANGE Acanthomyops subglaber to earthen mounds 5, under rock 6.

ADD Formica haemorrhoidalis thatch mounds 21.

Page 83. (continued)

CHANGE Formica altipetens to earthen mounds 27, under rocks 10, in rotten wood 1.

ADD Formica argentea earthen mounds 8, under rocks 40, misc. covering objects 7, in rotten wood 6.

CHANGE Formica fusca to earthen mounds 3, misc. covering objects 3, in rotten wood 71.

ADD Formica montana earthen mounds 46, under rocks 11, in rotten wood 3.

CHANGE Formica neoclara to no excavated material 9, earthen mounds 21, under rocks 1, under cow dung 2, under wood 2, misc. covering objects 2.

ADD Formica subsericea earthen mounds 138, under rocks 15, under wood 19, in rotten wood 53.

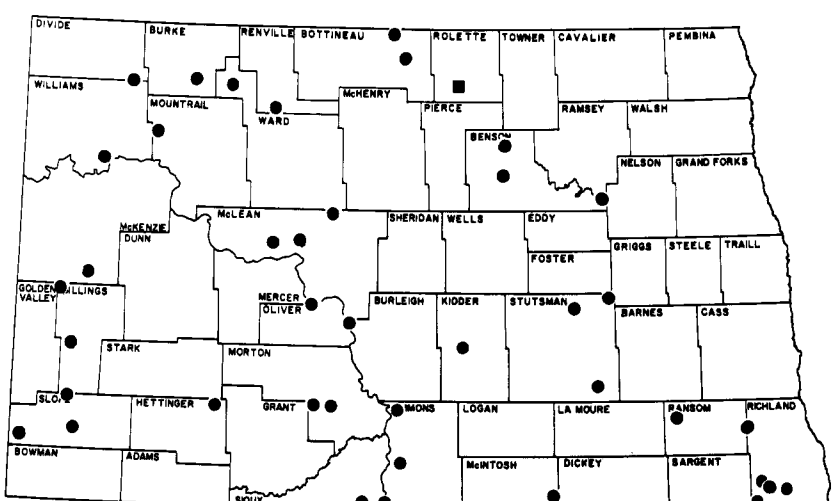
DELETE entirely *Acanthomyops parvulus, Formica cinerea lepida, F. c. montana, F. marcida*

Page 132. *DELETE* heading *Crematogaster (Acrocoelia) lineolata* (Say) and *SUBSTITUTE Crematogaster cerasi* (Fitch). This change may be made wherever appropriate throughout the book (see index).

Page 155. *DELETE* heading Genus DORYMYRMEX Forel and *SUBSTITUTE* Genus CONOMYRMA Forel; *DELETE Dorymyrmex pyramicus* (Roger) and *SUBSTITUTE Conomyrma insana* (Buckley). These changes may be made wherever appropriate throughout the book (see index).

Page 174. *DELETE* heading Genus PARATRECHINA Motschulsky and *SUBSTITUTE* Genus NYLANDERIA Emery.

Page 175. *DELETE Paratrechina (Nylanderia) parvula* (Mayr) and *SUBSTITUTE Nylanderia parvula* (Mayr). These changes may also be made wherever appropriate throughout the book (see index).



Map 1. Acanthomyops coloradensis ●; Lasius speculiventris ■.

Page 191. *INSERT* before *L. (Ch.) subumbratus:* –

Lasius (Chthonolasius) speculiventris (Emery)

This species is a temporary social parasite on *Lasius minutus*. Number of collections: 1.

DESCRIPTION–*Worker*. Length 4¼ mm. Yellowish brown (10YR 5/8). Head and thorax dull; gaster shining.

RANGE–Pennsylvania and New Jersey westward to North Dakota and Kansas.

NORTH DAKOTA RECORD–(See Map 1.) Rolette County: 25-160-73. In a tall grass-grown mound in a dried alkali marsh; dead shells of aquatic snails lying on top of the mound showed that the area had been flooded. The surface of the mound was hard, but inside the soil was soft. Crushed workers gave off a strong citronella odor.

Page 194. Under Genus ACANTHOMYOPS Mayr *ADD* to introductory remarks the following two paragraphs: –

In his 1968 revision of this Nearctic genus Wing recognized 15 species; six of these are found in North Dakota. They can probably be distinguished in the following adaptation from Wing's Shorter Key. He admits that *claviger* and *coloradensis* are difficult to separate; for us it is impossible. A colony from Grand Forks, North Dakota we would call *coloradensis* but one from East Grand Forks, Minnesota, would be in *claviger*.

Several species of *Acanthomyops* can apparently hybridize quite readily. Therefore one is likely to encounter forms that will not key out. In such cases one should consult Wing's General Key (1968: 55-67) or – better yet – send them to a specialist.

Page 195. *SUBSTITUTE* the following key: –

KEY TO THE SPECIES OF ACANTHOMYOPS

1a. Standing hairs on gastric dorsum 0.23 mm long or longer, restricted (except on first) to posterior edges of tergites; pubescence on gaster dilute, that on head moderately dense; mandibles with one or more denticles on basal margin; crest of petiole sharp and emarginate; large; yellow to pale brownish yellow . . . . . *interjectus*

1b. Standing hairs on gastric dorsum more or less uniformly distributed and not restricted to posterior edges of tergites; pubescence, petiolar scale and size varying 2

2a. Crest of petiole in profile very to moderately blunt, in anterior view straight or convex; entire surface of gula with numerous (20-40) long erect hairs 3

2b. Crest of petiole in profile sharp to moderately sharp, in anterior view usually with a distinct median emargination; gula either without hairs or with fewer erect hairs limited to upper ¾ to ½ of its surface 4

3a. Standing hairs short; about twice as numerous on epinotum as elsewhere on thorax (female with hairs mostly appressed and matted to surface) . . . . . *murphyi*

3b. Standing hairs longer; more or less uniformly distributed over thorax (female usually hairy, hairs erect and uniformly distributed; thorax long; femora and tarsi resembling flat plates; antennae short and strongly clavate) . . . . . *latipes*

Page 195. (continued)

4a. Pubescence on first gastric tergite dilute to moderately dense; larger species . . . . . *coloradensis*

4b. Pubescence on first gastric tergite dense to moderately dense; smaller species 5

5a. Scale of petiole sharp and high, exceeding level of epinotal spiracle . . . . . *occidentalis*

5b. Scale of petiole somewhat blunt and low, not reaching level of epinotal spiracle . . . . . *subglaber*

Page 195-204. *REVISE* as follows:–

Acanthomyops coloradensis (Wheeler)

Under the above name should be included those ants that we called *Acanthomyops claviger* in 1963.

The number of collections should be *CHANGED* to 59. *DELETE* remainder of first paragraph.

HABITAT–In the last sentence *CHANGE* 38 to 43 and *ADD:*–and one was in a cottonwood grove along the Missouri River.

NESTS–*CHANGE* second sentence to read:– In North Dakota 43 nests have been found under stones, 4 under other objects, 3 in grass-grown mounds of excavated soil, 2 in the ground without excavated soil and 2 with craters.

RANGE–Manitoba to South Dakota and westward to Alberta and Oregon, with a southward extension through Utah and Colorado to New Mexico. In North Dakota it is found throughout the state.

NORTH DAKOTA RECORDS–(See Map 1.) *DELETE* localities and mapped spots in Cass and McHenry Counties and 24-157-56 in Walsh County. *ADD* Benson County: 19-153-69; Leeds. Burleigh County: 10-142-81. Kidder County: 36-130-67. Mountrail County: 28-159-92.

Acanthomyops interjectus (Mayr)

CHANGE number of collections to 28.

HABITAT–Second sentence should be *CHANGED* to:–In North Dakota 12 nests have been found in grasslands and 4 at the edges of woods.

NESTS–*CHANGE* the third sentence to:–In North Dakota 4 nests have been found under stones, 6 under grass-grown mounds of excavated soil, 3 in mounds of excavated soil, 1 under a log lying on the ground and 1 in leaf mold.

RANGE–Southern New England to Georgia and westward to New Mexico, Utah and Idaho. In North Dakota it occurs sporadically throughout the state.

NORTH DAKOTA RECORDS–*DELETE* the records and map spots in Benson, Burleigh, Kidder and Mountrail Counties.

Acanthomyops latipes (Walsh)

CHANGE number of collections to 18. *DELETE* remainder of first paragraph.

HABITAT–*CHANGE* second sentence to:–In North Dakota 10 nests have been found in the grasslands and 1 in woods.

NESTS–*CHANGE* second sentence to:–In North Dakota 11 nests were found under stones, 1 under a small grass-grown mound and 1 in rotten wood buried under leaf mold.

RANGE–From coast to coast in southern Canada and in the United States except in the Gulf states. In North Dakota it occurs sporadically throughout the state.

NORTH DAKOTA RECORDS–*DELETE* the records and map spots from Divide and Ward Counties and 17-134-106 from Slope County. *ADD* to Slope County: 35-134-106.

Acanthomyops murphyi (Forel)

DELETE the first sentence.

RANGE–Coast to coast in southern Canada and the United States except the Gulf states.

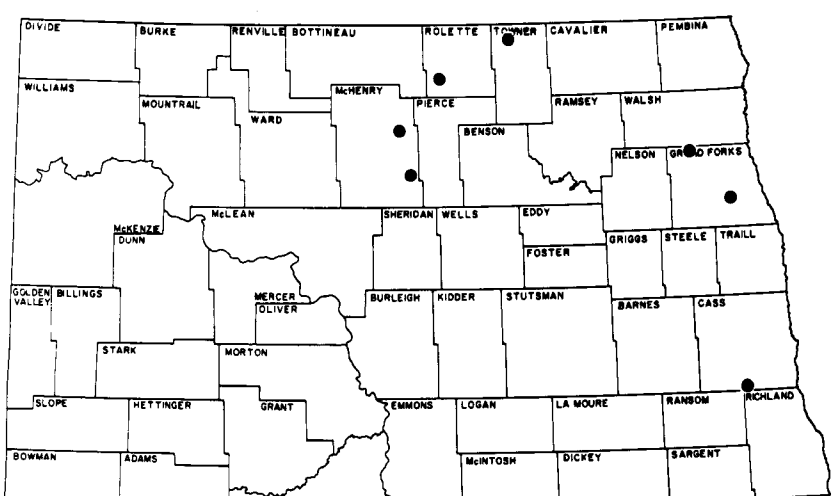
Acanthomyops occidentalis (Wheeler)

Number of collections: 8

DESCRIPTION – *Worker*. Length 3¼ - 3¾ mm. Yellow (10YR 8/8). Shining.

RANGE – British Columbia and Washington to Manitoba and Minnesota, with a southward extension through Nebraska, Wyoming, Colorado and eastern Utah to New Mexico. In North Dakota it has been reported only from the eastern half of the state.

NORTH DAKOTA RECORDS – (See Map 2.) Cass County: Leonard. Grand Forks County: 16-151-52; 11 & 14-154-55. McHenry County: Round Lake (nr-153-75); Towner. Rolette County: 25-160-73. Towner County: 27-163-77.



Map 2. Acanthomyops occidentalis.

Page 195-204 (continued)

Acanthomyops parvulus (M.R. Smith)
Wing considers this a synonym of *claviger. DELETE* entirely.

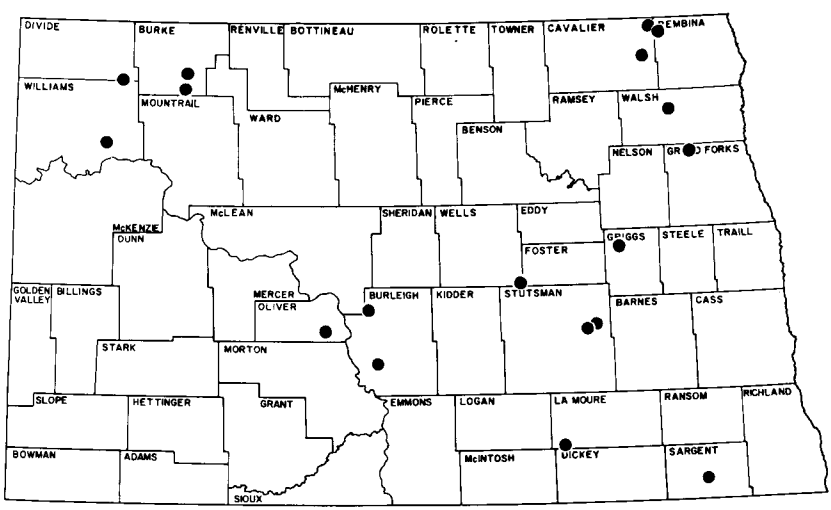
Acanthomyops subglaber (Emery)
CHANGE number of collections to 17.

HABITAT – Eleven North Dakota colonies were in grasslands.

NESTS – In North Dakota six nests were under stones and five were under earthen mounds; for one of the latter the mound measured 30 by 40 inches and was 10 inches high.

RANGE – From Saskatchewan and the Black Hills of South Dakota eastward and southeastward to the Atlantic states from Maine to Georgia. In North Dakota it occurs sporadically throughout the state.

NORTH DAKOTA RECORDS – (See Map 3.) Burke County: nr-159-91; 22-160-91. Burleigh County: 26-139-79; 29-143-79. Cavalier County: 1-161-58; nr-163-57; 7-163-57. Divide County: 36-160-96. Grand Forks County: 11 & 14-154-55. Griggs County: Binford. Lamoure County: Kulm. Oliver County: 7-141-82. Pembina County: Pembina Mts. Sargent County: 19-130-55. Stutsman County: 8-141-63; 36-142-63. Walsh County: 22-157-56. Wells County: 25-145-68. Williams County: 17-155-97.



Map 3. Acanthomyops subglaber.

Page 205. Paragraph 2, line 2 *CHANGE* 37% (30 our of 82) to 40% (34 out of 86). Line 3 *CHANGE* 36% (1838 our of 5054) to 38% (1970 out of 5054). Last line *CHANGE* (*Formica fusca*) to (*Formica subsericea*) and (*Formica obscuriventris*) to (*Formica hewitti, F. opaciventris* or *F. subintegra*).

Page 205. *DELETE* KEY TO SUBGENERA and *INSERT* the following paragraph:—The subdivision of this large genus has undergone extensive changes since 1963. We no longer recognize subgenera – only species-groups. The subgenus *Proformica* has become the *neogagates* group. The subgenus *Raptiformica* is now the *sanguinea* group. Some of the species of the subgenus *Neoformica* have been transferred to the *fusca* group; the remainder constitute the *pallidefulva* group. The following key to the species-groups of *Formica* will replace our keys beginning on pages 205 and 228.

KEY TO THE SPECIES-GROUPS OF *FORMICA*

1a. Ventral border of clypeus notched in middle; integument dull; pubescence dense, at least on gaster; bicolored (except concolorous reddish yellow in *parcipappa*), head and thorax reddish brown or reddish yellow, gaster brown or black; metanotum small but distinct; epinotum short and distinctly angulate in profile; facultative slave makers; colony-founding parasite . . . . . *sanguinea* Group

1b. Without the above combination of characters 2

2a. Slender; surface shining; epinotum rounded in profile (*i.e.*, base and declivity not differentiated) 3

2b. Generally robust; surface usually dull; epinotum usually angulate in profile (*i.e.*, base and declivity clearly differentiated) 4

3a. Scapes shorter (less than 1¼ head length); frontal carinae subparallel, not diverging dorsally; smaller ants (2½-6 mm long). . . *neogagates* Group

3b. Scapes slender, long (1¼ - 1-1/3 times length of head); scarcely curved at base; median joints of funiculus more than 1½X as long as broad; posterior face of petiolar scale convex; frontal carinae long and sigmoid; larger ants (4-7 mm long) . . . . . **pallidefulva* Group

4a. Larger workers with occipital border distinctly concave; pronotum (in profile) with basal and declivous faces meeting at an angle . . *exsecta* Group

4b. Larger workers with occipital border at most slightly concave, usually flat or slightly convex; pronotum (in profile) evenly convex, not angulate 5

5a. Erect hairs (when present) on pronotum of workers often clavate or spatulate (female never more than 5½ mm long and never larger – but often smaller – than largest workers; feebly shining or opaque) . . . . . *microgyna* Group

5b. Erect hairs (when present) on pronotum of workers not notably clavate or spatulate (female usually 8 mm or more long and notably larger than largest worker, or if less than 8 mm long and no larger than largest worker, very smooth and shining) 6

6a. Bicolored, head and thorax reddish or yellowish red and notably lighter than gaster or, if infuscated, infuscation not completely masking reddish ground color in larger workers; surface mostly dull; frontal area shining; frontal carinae strongly divergent dorsally; polymorphic . . . *rufa* Group

6b. Concolorous or bicolored, if bicolored, thorax lighter than gaster and upper half of head; frontal area usually opaque; frontal carinae moderately divergent dorsally, often parallel . . . . . *fusca* Group

Page 206. *DELETE* the headings Subgenus PROFORMICA Ruzsky and KEY TO THE SPECIES OF THE SUBGENUS PROFORMICA and *ADD* instead the headings:–

THE *NEOGAGATES* GROUP
KEY TO THE SPECIES OF THE *NEOGAGATES* GROUP

Page 206. *Formica bradleyi* W.M. Wheeler

DELETE all but the first paragraph and *SUBSTITUTE*:–

During six summers Dr. Dalton Halverson lived with this species in the sandhills of North Dakota. The results of his observations are far too extensive to be summarized here. Consequently the interested reader should consult Halverson, Wheeler and Wheeler (1976).

Page 214. *DELETE* the heading Subgenus RAPTIFORMICA Forel and *SUBSTITUTE:*–THE *SANGUINEA* GROUP

Page 215. For Paragraph 3 *SUBSTITUTE:*–In North Dakota slave makers can be arranged on the basis of their increasing slave-making propensity as measured by the proportions of nests found with slaves: *Formica obtusopilosa* – 4 out of 52 collections; *F. subnuda* – 21 out of 134 collections; *F. puberula* – 3 out of 4; *F. rubicunda* – 38 out of 49; *F. wheeleri* – 14 out of 15. A slave maker colony usually has only one species of slaves, but we have occasionally found two species of slaves in the same nest. There is no reason why the number of species of slaves found in a colony should not include all of the species in the *neogagates* and *fusca* groups of *Formica* within the raiding territory of that colony.

Page 220. Under *Formica pubercula CHANGE* collections from six to four. *REMOVE* from the map the spots in Pierce and Stutsman Counties.

Page 221. Under HABITS line 3 *CHANGE* to:– The North Dakota slaves of *F. puberula* are *F. altipetens* and *F. subsericea*. From North Dakota Records *DELETE* Pierce and Stutman Counties and under Grand Forks County *CHANGE* 5-151-50 to Grand Forks.

Page 222. Under HABITS line 3 *CHANGE* to:– The North Dakota slaves are *F. altipetens, argentea, bradleyi, fusca, lasioides, montana, neogagates* and *subsericea.*

Page 224. Last paragraph line 3 *CHANGE* to:– The North Dakota slaves are *F. altipetens, fusca, montana, neorufibarbis* and *subsericea.*

Page 229. *REPLACE* heading with THE *RUFA* GROUP.

Page 233. 14b. *CHANGE* species? to *haemorrhoidalis.*

Page 239. *INSERT* the following before *Formica laeviceps*:–

Formica haemorrhoidalis Emery

In our discussion of the *rufa* group we referred (1963: 230) to a residue of unidentifiable collections. Brown (1965) solved part of the problem by placing Forms B, C and D in *F. haemorrhoidalis*. Number of collections: 21.

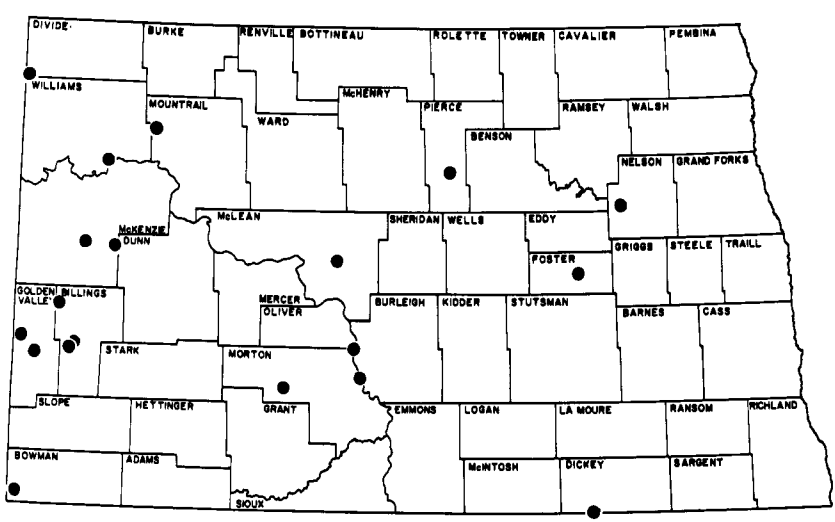
DESCRIPTION–*Workers*. Length 4-9 mm. Dull. *Major worker*. Head yellowish red (5YR 4/8), thorax reddish yellow (7.5YR 6/6), gaster dark reddish brown (2.5YR 2/4). *Minor worker*. Head and thorax yellow (10YR 8/8) extensively infuscated with dusky red (2.5YR 3/2), gaster dark reddish brown (2.5YR 2/4).

HABITAT–In Colorado (Gregg 1963) it ranges from 5,100 to 10,000 ft; in mixed and deciduous forests, pinyon-juniper, grassland and sagebrush desert. In North Dakota it is a grasslands species which prefers shrubby areas, notably sagebrush.

NESTS–The next is usually started under a stone or log or around the base of some small plant (frequently sagebrush). Those under stones or logs may be banked with plant detritus. In some nests very little thatch is used. In North Dakota large dome-like thatch mounds are common, averaging perhaps 8 inches high and 24 inches in diameter. The large thatch domes have numerous entrances over all parts of the surface; on one 85 were counted.

RANGE–California to Washington; thence eastward to Colorado and the Dakotas.

NORTH DAKOTA RECORDS–(See Map 4.) Billings County: 10, 11 & 12-140-102; 33-141-101; Mikkelson. Bowman County: 5-129-106. Burleigh County: 3-140-81. Dickey County: 32-129-64. Divide County: 28-160-103. Foster County: 22-146-64. Golden Valley County: 28-141-105; Sentinel Buttes. McKenzie County: 35-148-99; 26-148-100. McLean County: 23-147-82. Morton County: 13-138-81; 34-138-86.



Map 4. Formica haemorrhoidalis.

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Mountrail County: 9-156-94. Nelson County: 7-151-60. Pierce County: 1-153-73. Williams County: 23-154-98.

Page 247. Under HABITS line 7 *CHANGE marcida* to *subsericea*. In last sentence *DELETE*:–*c.*

Page 252. *CHANGE* heading to THE *MICROGYNA* GROUP.

Page 254. *CHANGE* heading to THE *EXSECTA* GROUP.

Page 258. *CHANGE* heading to THE *FUSCA* GROUP.

Page 259. *DELETE* the last paragraph above the key and *SUBSTITUTE* the following:–

The *fusca* group of *Formica* was extensively revised by Francoeur in 1973. Whereas Creighton in 1950 had recognized 13 species in the group, Francoeur increased the number to 33, 14 of which were new. Although we do not accept all of his changes, we nevertheless find it necessary to make a complete revision for the group.

The first couplet of our new key requires explanation, since it involves a new character discovered by Francoeur. It is a very useful character, but it is difficult to see without some preparatory technique. Here are directions based upon our method: From the preserved sample of a colony belonging to the *fusca* group, pin three representative workers on three triangles on the same pin, in the customary manner. Grasp a fourth worker by the thorax with forceps. Hold it firmly on its back. With fine forceps remove the meso- and metathoracic legs,especially the entire coxae. Put a fourth triangle on the pin; to its tip glue the mutilated ant upside down. The characters of the first couplet will then be in plain view. See Fig. 1-11.

If the colony is represented only by dried ants on a pin, *i.e.*, no duplicates in alcohol, the technique is somewhat more difficult. Remove one of the triangles from the pin and soak it and its ant in relaxing fluid (Wheeler and Wheeler 1963: 42). Transfer to a solvent which will loosen the relaxed ant from the triangle. Remove the legs and remount upside down, as described above.

Sometimes one or two legs can be removed from a dry ant while it is still on the triangle, *i.e.*, without relaxing. This should be done with fine forceps and a bright light is required to see the results. This technique leaves the ant right-side-up, but minus a leg or two; it should be used only as a last resort.

Pages 259-260. *DELETE* the key and SUBSTITUTE the following key which is adapted from Francoeur's:

KEY TO THE SPECIES OF THE *FUSCA* GROUP

1a. Metasternum with a pair of distinctly pilose lobes (Fig. 1, 3, 4), arising one on either side of median sternal cavity (Fig. 2); mesometasternal profile composed of a concavity followed by a pilose triangle (Fig. 1, 3, 4) 2

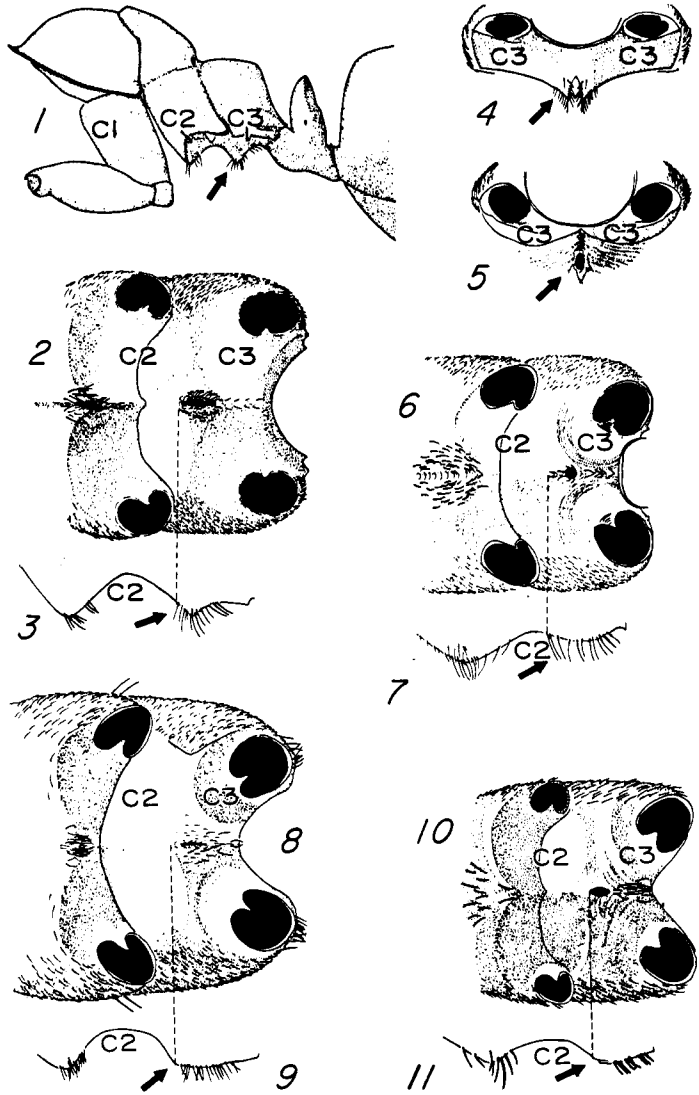


FIG. 1. Thorax, petiole and anterior portion of gaster in side view. C1, procoxa; C2, cavity of mesocoxa; C3, cavity of metacoxa. Arrow points to triangular metasternal process with tuft of hairs. *Formica subpolita*, X21. (Drawn from our Nev. #320, det. A. Francoeur.)

FIG. 2. Meso- and metasterna in ventral view, showing triangular pilose process on each side of spinasternal cavity. *F. subpolita*, X50. (Nev. #320.)

FIG. 3. Mesometasternal profile of Fig. 1; arrow points to triangular process with tuft of hairs. *F. subpolita*, X50. (Nev. #320.)

FIG. 4. Metasternum in posterior view; arrow points to left triangular process beside spinasternal cavity. *F. subpolita*, X50. (Nev. #320.)

Pages 259-260 (continued)

FIG. 5. Metasternum in posterior view; arrow points to spinasternal cavity; metasternal triangle lacking; cavity surrounded by hairs. *Formica sibylla*, X50. (Drawn from our Nev. #68, det. A. Francoeur.)

FIG. 6. Meso- and metasterna in ventral view, showing spinasternal cavity with surrounding hairs. *F. sibylla*, X50. (Nev. #68.)

FIG. 7. Mesometasternal profile of Fig. 6. Arrow points to spinasternal area with surrounding hairs. *F. sibylla*, X50. (Nev. #68.)

FIG. 8. Meso- and metasterna in ventral view, showing abundant pilosity surrounding spinasternal cavity. *Formica pacifica*, X50. (Drawn from our Nev. #2616.)

FIG. 9. Mesometasternal profile of Fig. 8. Arrow points to *une convexité haute et de largeur moyenne et sans protubérance* (Francoeur 1973: 28)(= a high convexity of average width and without protuberance [= triangle]). *F. sibylla*, X50. (Nev. #2616.)

FIG. 10. Meso- and metasterna in ventral view showing "hairs not surrounding spinasternal cavity and generally restricted behind it" (Francoeur 1973: 296). *Formica argentea*, X50. (Drawn from our Nev. #444.)

FIG. 11. Mesometasternal profile of Fig. 10. Arrow points to spinasternal area which lacks hairs. *F. argentea*, X50. (Nev. #444.)

1b. Metasternum without such lobes; mesometasternal profile composed of a concavity followed by a straight or convex line (Fig. 5-11) 11

2a. Eyes and scapes with numerous small erect hairs . . . . . **pilicornis*

2b. Eyes and scapes without erect hairs 3

3a. Concolorous 4

3b. Head and body bicolored 8

4a. Dark brown or black 5

4b. Pale brown or yellowish brown 7

5a. Gula without erect hairs . . . . . **occulta*

5b. Gula with erect hairs 6

6a. Erect hairs present on genae and episterna . . . . . *montana*

6b. Erect hairs absent from genae and episterna . . . . . *altipetens*

7a. Gula without erect hairs . . . . . *neoclara*

7b. Gula with erect hairs . . . . . *montana*

8a. Gula without erect hairs . . . . . *neoclara*

8b. Gula with erect hairs 9

9a. Yellowish brown (more or less rusty) to brownish black; gaster darker than head, which is darker than thorax; head of largest workers subquadrate, as broad as (or broader than) long; gastric pubescence very dilute, surface strongly shining; thorax opaque or subopaque; strongly polymorphic . . . . . **subpolita*

9b. Gaster and upper portion of head yellowish brown to dark brown, thorax and lower part of head paler; gastric pubescence normal or dense, surface feebly shining or opaque; monomorphic or feebly polymorphic 10

10a. Occipital angles and episterna with erect hairs . . . . . *montana*

10b. Occipital angles, genae and episterna without erect hairs . . . *altipetens*

11a. Concolorous 12

11b. Head and body bicolored (minors and some majors may be so infuscated that the lighter color is reduced to patches on genae and thorax) 23

12a. Dark brown or black 13

12b. Pale brown or yellowish brown 22

13a. Gena between eye and mandible with coarse elongate punctures, widely spaced on dorsal half of gena (Fig. 12, 13); metasternal pilosity abundant and surrounding metasternal cavity (Fig. 5, 6, 7); gula with erect hairs . . . . . *hewitti*

13b. Gula between eye and mandible without coarse elongate punctures or, if present, they are concentrated on upper half, where they are closely spaced and interspersed with fine circular punctures (Fig. 14, 15). 14

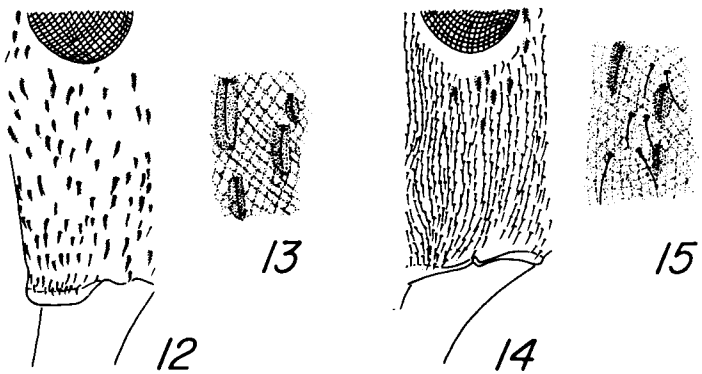


FIG. 12. Gena between eye and mandible with coarse widely spaced elongate punctures. (See our *fusca* Group key 13a). *Formica hewitti*, X65. (Drawn from our South Dakota #156, det. A. Francoeur.)

FIG. 13. Enlargement of portion of Fig. 12; note that each puncture contains a hair, X260. (S.D. #156.)

FIG. 14. Gena between eye and mandible with a few coarse elongate punctures near the eye and interspersed with fine circular punctures (= hair bases). *Formica aerata*, X65. (Drawn from our California #50, det. A. Francoeur.)

FIG. 15. Enlargement of portion of Fig. 14, near eye, X260. (Cal. #50.)

14a. Gula without erect hairs 15

14b. Gula with erect hairs 19

15a. Epinotum depressed, elongate, without a distinct angle, basal and declivous faces forming a single convexity; hairs sparse; upper surface dulled by a reticulum of closely spaced fine rugulae; punctures on frons finer (scarcely visible at 100X), interspersed with fine rugulae . .**subelongata*

15b. Epinotum higher, its basal and declivous faces distinct and generally forming a well marked angle; punctures on frons coarser 16

16a. Hairs on first gastric tergite (exclusive of posterior row) abundant (average 20, rarely fewer than 10); metasternum less pilose, hairs not surrounding metasternal cavity but usually restricted to region behind it (Fig. 10, 11) 17

Pages 259-260 (continued)

16b. Hairs on first gastric tergite (exclusive of posterior row) sparse (average 4, rarely more than 10); metasternum more pilose, hairs surrounding metasternal cavity (Fig. 6, 7, 8, 9) 18

17a. Pubescence dense to very dense on genae and first four gastric tergites, producing a silvery luster . . . . . *argentea*

17b. Pubescence dilute to normal on fourth gastric tergite and on genae (at least on dorsal half), with a silky luster . . . . . *subsericea*

18a. Eyes smaller, ocular index 31-35; scapes longer than head . .**microphthalma*

18b. Eyes larger, ocular index 34-43 . . . . . *fusca*

19a. Occiput without erect hairs (occasionally with 1-3 short hairs) . . . **sibylla*

19b. Occiput with erect hairs (at least 5, but usually numerous) 20

20a. Scapes longer than head, scape index usually 116-130; crest of petiole with a median notch; longest pronotal hairs less than height of frontal triangle . . . . . **transmontanis*

20b. Scapes shorter, scape index 85-117; crest of petiole entire; longest pronotal hairs less than height of frontal triangle 21

21a. Occipital angles, genae and episterna with erect hairs . . . . **longipilosa*

21b. Occipital angles, genae and episterna without erect hairs . . . . **aerata*

22a. Gula with erect hairs . . . . . **aerata*

22b. Gula without erect hairs . . . . . *argentea*

23a. Gula with erect hairs 24

23b. Gula without erect hairs 27

24a. Scale of petiole (in profile) thick and rounded at summit . . . . **lepida*

24b. Scale of petiole (in profile) thin and angulate at summit 25

25a. Gena between eye and mandible with coarse widely spaced elongate punctures (Fig. 12, 13); thorax and/or lower half of head paler; metasternal pilosity abundant and surrounding metasternal cavity (Fig. 8, 9) . . . . . *hewitti*

25b. Gena between eye and mandible without coarse elongate punctures or, if present, they are concentrated on upper half, where they are closely spaced and interspersed with fine circular punctures (Fig. 14, 15) . . .26

26a. Head rounded and broader or trapezoidal, with convex sides; scapes shorter (scape length minus head length -0.14 to -0.05 mm); ventral border of clypeus convex; crest of petiole usually entire . . . . . **aerata*

26b. Head rectangular and narrower, with straight sides; scapes longer (scape length minus head length -0.04 to +0.08 mm); ventral border of clypeus angulate and protuberant in middle; crest of petiole usually with median notch . . . . . **pacifica*

27a. Gena between eye and mandible with coarse widely spaced elongate punctures (Fig. 12, 13); head and gaster dark brown, thorax yellowish or reddish brown; thorax sometimes infuscated with lighter color reduced to mere patches; lower half of head sometimes paler; smallest workers may be entirely black . . . . . *neorufibarbis*

27b. Gena between eye and mandible without coarse elongate punctures or, if present, they are concentrated on upper half, where they are closely

Pages 259-260 (continued)

spaced and interspersed with fine circular punctures (Fig. 14, 15) 28

28a. Epinotum high, its angle distinct . . . . . **gnava*

28b. Epinotum long and low, its angle reduced to an even convexity 29

29a. Scale low and (in profile) thick and broadly rounded at summit, both its faces convex but anterior more so . . . . . **xerophila*

29b. Scale (in profile) high, thin and angulate at summit . . . . . **occidua*

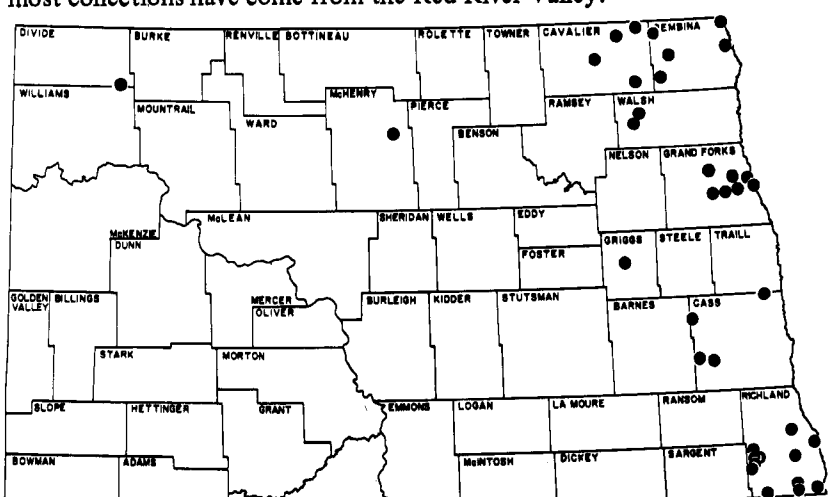
Page 260. Beginning with "Habitat" *DELETE* all the remaining paragraphs on *F. altipetens* and *SUBSTITUTE* the following:–

HABITAT – Wheeler (1913: 524) found this species in alpine meadows in Colorado and reported it as inhabiting cold bogs. Gregg (1963: 507) reported it in Colorado from coniferous and deciduous forests and grasslands; range in altitude from 6000 to 11,000 ft. In North Dakota it has been found exclusively in grasslands.

NESTS – In Colorado this species was found in "large earthen mounds (2-3 ft. in diameter and 6-10 inches high) overgrown with grass" (Wheeler, 1913: 524). Gregg (1963: 509) stated that in a few cases it nests under covering objects. In North Dakota 27 nests were covered with a mound of excavated soil, the largest being 21 inches in diameter and 7 inches high. Often the mound is grass-grown; frequently it has many entrances. Ten nests were under stones and one was in a rotten log.

MISCELLANEOUS – In North Dakota *F. altipetens* has been found as slaves of *Formica puberula, F. rubicunda, F. subnuda* and *F. wheeleri.* Elsewhere it has been enslaved by *F. puberula* and *Polyergus breviceps.* Workers of *F. altipetens* were found in the stomach of *Bufo cognatus* Say at Grandin, Cass County (Telford and Munro 1944: 36).

RANGE – North Dakota to Idaho and southward to northern New Mexico, northern Arizona, Nevada and eastern California. In North Dakota most collections have come from the Red River Valley.



Map 5. Formica altipetens.

Page 260 (continued)

NORTH DAKOTA RECORDS – (See Map 5.) Cass County: 21-139-54; 8-139-55; 17-142-55; *Grandin (Telford and Munro 1944: 36). Cavalier County: 3-159-58; 18-161-60; 13-161-61; 7-163-57; 26-163-59. Divide County: 36-160-96. Grand Forks County: 4-151-51; 9-151-52; 10-151-53; 7-152-50; Emerado; Gilby; Grand Forks; Kelly; Manvel; Mekinock. Griggs County: Binford. McHenry County: Towner. Pembina County: 34-160-56; 9-162-51; Joliette; Pembina; Wahalla. Richland County: 17 & 21-129-47; L.T.L. 17-129-51; 34-130-49; 3-131-49; 1, 16 & 33-131-52; 7-132-47; 1-132-48; 9-132-52; 3-133-49. Walsh County: 5-156-53; 11 & 12-157-53

Pages 261-268. *DELETE* entire text and maps and *SUBSTITUTE* the following text and maps:–

Formica argentea Wheeler

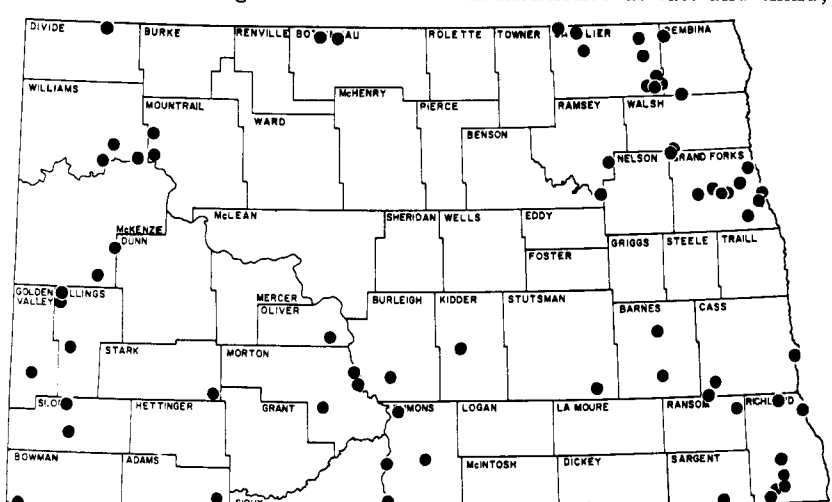
Number of collections: 121

DESCRIPTION–*Worker.* Length 3½-6½ mm. Head dark reddish brown (5YR 3/2), thorax and gaster yellowish red (5YR 4/6) to head, thorax and gaster reddish black (10R 2/1), appendages paler; with a silvery luster due to pubescence.

HABITAT–In North Dakota this is essentially a grasslands ant, 36 records. Only 6 records mention woods. It is evidently a very adaptable species: 22 records are from disturbed habitats, notably lawns and cultivated gardens. Seven records are from dwellings, sometimes during winter. No damage was mentioned; in fact, one record had the ants in a second-story window catching flies.

NEST–Most nests (40) were under stones, 8 under messy piles of excavated soil, 7 were under other objects lying on the ground and 6 were in rotten wood.

NOTES–*F. argentea* has often been mentioned as fast and timid;



Map 6. Formica argentea.

one large colony was very aggressive. In North Dakota it has been enslaved by *Formica puberula, F. rubicunda, F. wheeleri* and *Polyergus breviceps* and has been reported as a temporary host of *F. spatulata.*

RANGE–A triangle with its apex in eastern Massachusetts and its base on the Pacific coast from British Columbia to southern California. In North Dakota it has been found throughout the state.

NORTH DAKOTA RECORDS–(see Map 6.) Adams County: 7-129-91. Barnes County: 10-138-58; 5-141-58. Billings County: 1 & 12-140-102; 5-143-102; 16-144-102. Bottineau County: 15-163-75; 16-163-76. Bowman County: 31-129-106. Burleigh County: 9-137-78. Cass County: 34-137-55; 31-138-54. Cavalier County: 9 & 12-159-57; 2-159-58; 15-160-57; 1-161-58; 22-162-57; 7 & 20-163-57; 34-163-58; 33-164-58. Dickey County: 32-129-64. Divide County: 3-163-97. Emmons County: 2-129-79; 17-132-76; 28-136-78. Golden Valley County: 6-139-104. Grand Forks County: 31-151-50; 23-152-52; 36-152-54; 11 & 14-154-55; 6-154-56; Grand Forks; Kelly; Larimore; Thompson. Kidder County: 36-141-73. McKenzie County: 11-145-99; 1-147-98. Morton County: 15-136-83; Ft. Lincoln State Park; Mandan. Mountrail County: 3-154-94; 28-156-94. Oliver County: 17-141-82. Pembina County: 32-159-55; Walhalla. Ramsey County: 2-151-62; 23-154-61. Ransom County: 34-136-53. Richland County: L.T.L. 5-129-52; 28-130-50; 36-130-51; 34-131-50; 27-136-50; 5-135-48; 1-136-49; 17-136-50. Sargent County: 13-129-55. Sioux County: 9-129-79; 22-132-79. Slope County: Logging Camp Ranch (=17-136-102); 24-134-102. Stark County: nr-137-91. Stutsman County: 3-137-63. Walsh County: 32-155-56. Williams County: 17-154-95; 23-154-98; 16-155-97.

Formica fusca Linnaeus

This is not equivalent to our 1963 *fusca* but is only a part of it. Number of collections: 81.

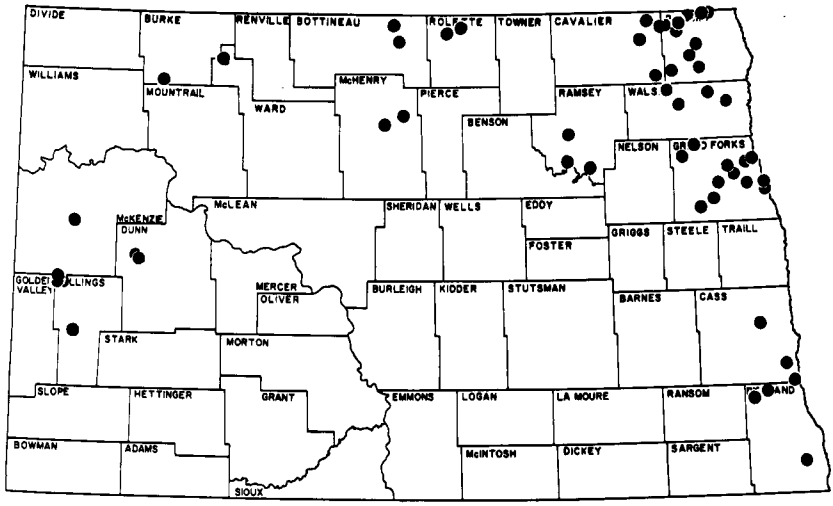
DESCRIPTION–*Worker.* Length 3½-6¼ mm. Head very dusky red (2.5YR 2/2), thorax and gaster dark reddish brown (5YR 3/3) to entirely black (7.5YR 2/0), appendages paler. Shining, especially head and gaster. *Female* and *male* similar in sculpture and color.

HABITAT–In North Dakota this species is essentially an inhabitant of open woods (62 records), seldom (6 records) of grasslands.

NESTS–Nests were typically (71 records) in rotten wood. In 3 colonies they were under mounds of excavated soil and there were 3 examples of nests under objects lying on the ground.

MISCELLANEOUS–Workers of *F. fusca* were found tending the aphid *Aphis helianthi* Monell (L.M. Russell det.) on *Yucca glauca* in Billings County (33-141-101). *F. fusca* was often characterized as fast and timid. It was enslaved by *Formica subnuda* and *Polyergus breviceps.* It was also reported as the temporary host of *Formica ulkei.*

RANGE–In the East, southern Canada and the northern states to Minnesota and Iowa and southward in the mountains to South Carolina; in the West, California to the Yukon and eastward to Manitoba and the Dakotas. In North Dakota it had been collected throughout the northern



Map 7. Formica fusca.

two-thirds; in the southern third it had been taken only along the eastern border.

NORTH DAKOTA RECORDS–(See Map 7.) Billings County: 33-141-101; 5 & 15-144-102; Mikkelson. Bottineau County: 16-163-76; 36-164-75; Bottineau. Burke County: Lostwood Wildlife Refuge. Cass County: 36-137-49; 19-138-49; 10-141-51. Cavalier County: 9-159-57; 27-162-58; 7 & 30-163-57. Dunn County: 10 & 23-146-96. Grand Forks County: 23 & 26-151-50; 16-151-51; 36-152-54; 12-153-51; 11 & 14-154-55; Grand Forks; Inkster; Kempton; Manvel; Mekinock. McHenry County: 4-155-77; Towner. McKenzie County: 32-148-100. Pembina County: 16-159-56; 3-160-53; 6-162-55; 1, 21 & 29-163-55; 33-164-53; Cavalier; Neche; Walhalla. Ramsey County: 28-153-62; 20-153-64; 26-155-64. Richland County: 30-131-48; 14-136-51; 35-136-52. Rolette County: 4-162-73; 30-163-71. Walsh County: 9 & 18-157-52; 23 & 24-157-56; 30-158-53; 18-158-56. Ward County: 1-160-89.

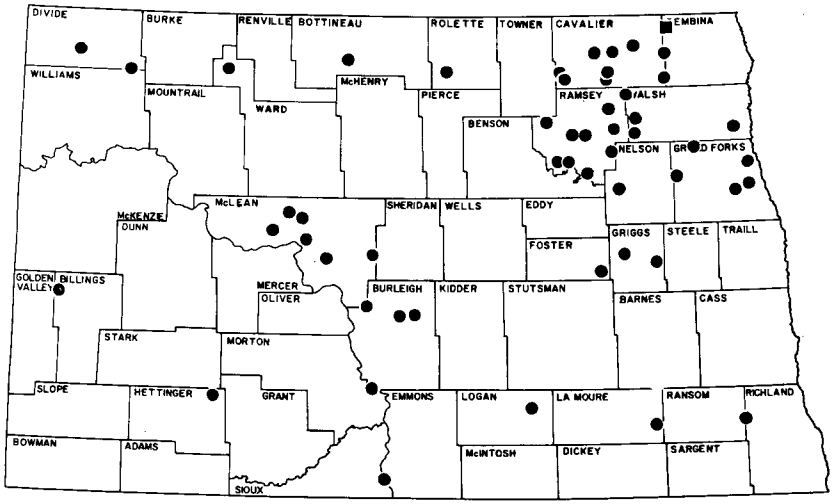
Formica hewitti Wheeler

We have only one record of this species from North Dakota: Walhalla, Pembina County. (See Map 8.)

DESCRIPTION–*Worker*. Length 5-6 mm. Lower part of head red (10R 4/6) with reddish black (10R 2/1) infuscation, thorax dusky red (10R 3/2), gaster very dusky red (10R 2/2) to head, thorax and gaster black (N 0/), appendages and mandibles paler. Thorax dull, head somewhat shining, especially above, gaster more shining, frontal area shining.

NOTES FROM LITERATURE–A forest species. Nests under stones and in rotten wood.

RANGE–Rocky Mountains from southern Canada to New Mexico; from southern Manitoba and northeastern North Dakota eastward to Maine and Quebec.



Map 8. Formica hewitti ■; F. montana ●.

Formica montana Emery

We consider *F. canadensis* to be a synonym of this species. In the field it appears black or dirty brown. It is definitely a grasslands species and usually nests under earthen mounds. Number of collections: 85.

DESCRIPTION–*Worker*. Length 3½-6½ mm. Head and thorax reddish brown (5YR 4/4) with dark reddish brown (5YR 3/2) infuscation, gaster dark reddish brown with very dusky red (5YR 2/2) infuscation to head, thorax and gaster very dusky red (2.5YR 2/2) with black (N 2/0) infuscation. Moderately shining with a silky luster due to pubescence.

HABITAT–In North Dakota 70 of our records were from grassland, while only 3 were from woods.

NESTS–*Formica montana* nests in the soil and the nest is usually (46 records) surmounted by a mound of excavated earth; 11 nests were under stones and 3 were in rotten wood. The size of the nest varies greatly, of course, depending upon the age and population of the colony; usually it is not more than seven inches high. In Rolette County we found a colony of this species on low prairie in a tall mound nest, on top of which *Puccinellia nuttalliana* (salt meadow grass) and *Distichlis stricta* (salt grass) were growing; these are indicators for low wet alkaline prairie. Our clue to the purpose of the tall mounds was the finding of numerous dead shells of aquatic snails on the tops of the dry mound. The Oakville Prairie Biology Area, Grand Forks County, which is a low alkaline prairie, shows countless large (often 12 inches high) conspicuous earthen mounds constructed by ants to get above the water table. *F. montana* is one of the common inhabitants of these mounds.

MISCELLANEOUS–*F. montana* is usually considered as fast and timid, but populous colonies may be very aggressive and bite viciously. In North Dakota they have been taken as slaves of *F. rubicunda, F. subnuda, F. wheeleri* and *Polyergus breviceps*.

Pages 261-268 (continued)

RANGE–California to southern Alberta, eastward across southern Canada to southern Manitoba; thence southeastward to Ohio; southwestward to New Mexico and Arizona. In North Dakota it ranges throughout the state.

NORTH DAKOTA RECORDS–(See Map 8). Billings County: Mikkelson. Bottineau County: 31-161-79. Burleigh County: nr-142-76; 28-142-77; Wilton. Cavalier County: 13-159-57; 15-159-61; 5 & 18-159-63; 36-160-61; 18-161-60; 13-161-61; 36-162-59. Divide County: 36-160-96; 26-161-99. Emmons County: 20-130-79. Foster County: 16-146-62. Grand Forks County: 4-151-51; 9, 16 & 26-151-52; 11 & 14-154-55; Manvel; Niagara. Griggs County: 26-146-58; Binford. Hettinger County: 18-136-91. Lamoure County: 15-134-59. Logan County: 9-135-68. McLean County: 11-146-79; 21-146-82; 36-148-84; 17-148-86; 28-149-83; 1-149-85. Morton County: 36-137-80. Nelson County: 7-151-60. Pembina County: Concrete. Ramsey County: 12-152-63; 16-153-64; 13-153-65; 23-154-61; 14-155-63; 12-155-64; 36-156-61; 18-156-65; 22-157-61; 2-158-60. Richland County: 7-134-52. Rolette County: 25-160-73. Walsh County: 4-155-52; 16-155-58; 9-156-59; 24-158-59. Ward County: Kenmare.

Page 268-271. *Formica neoclara* Emery: no changes except:–

NEST–*ADD* at end:– Other nests – 4 in rotten wood, 7 under objects lying on ground and 9 with exposed entrances (*i.e.*, no cover or excavated soil).

HABITS–*ADD* Enslaved by *Polyergus breviceps*.

RANGE–From the Yukon to Texas and from the Pacific states and British Columbia eastward to the eastern Dakotas.

NORTH DAKOTA RECORDS–*ADD* Bottineau County: 16-163-76.

Page 271-272. *Formica neorufibarbis* Emery: no changes except:–

HABITS–*ADD* Enslaved by *F. subnuda*.

RANGE–An enormous triangle from Behring Strait in western Alaska and the Mackenzie delta (on the border of the Arctic Ocean) to an apex on Newfoundland; thence southwestward to New Mexico and Arizona; its base extending northward along the Pacific coast to southern and central Alaska.

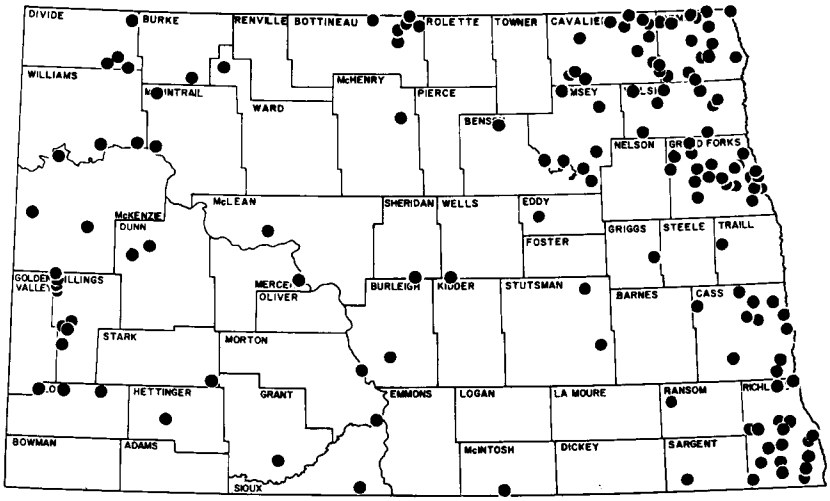
NORTH DAKOTA RECORDS–*DELETE* Bottineau County: 16-163-76.

After Page 272 *INSERT:–*

Formica subsericea Say

Our *subsericea* is not the equivalent of Francoeur's, for we consider his *glacialis* and *podzolica* as synonyms of *subsericea*. Number of collections: 335.

DESCRIPTION–*Worker*. Length 4-7 mm. Head, thorax and gaster reddish black (10R 2/1) to black (N 0/), appendages somewhat paler; with a silky luster due to pubescence.



Map 9. Formica subsericea.

HABITAT–This species is very adaptable, nesting in a wide variety of habitats–from seashores to alpine meadows and from grasslands to dense coniferous forests. In North Dakota 122 nests were in woods, 66 in grasslands, 8 in thickets, many in disturbed terrain. The workers occasionally enter dwellings, especially in winter, but they do no harm.

NESTS–*F. subsericea* is plastic as to nest form, but most commonly it nests in the earth under a messy mound of excavated soil, which has many entrances and which is usually grass-grown. In North Dakota 138 nests were of this type, 53 were in rotten wood, 15 were under stones, and 19 were under logs or other objects lying on the ground.

ENEMIES–In North Dakota *F. subsericea* has been enslaved by *F. puberula, F. reflexa, F. rubicunda, F. subnuda, F. wheeleri* and *Polyergus breviceps*. It has been recorded as a temporary host of *F. spatulata*. The larvae have been parasitized by what may be phorid larvae (det. W.W. Wirth); *Microdon* larvae have been found in the nest. A bethylid female (*Pseudisobrachium* sp.) was found in one nest.

RANGE–Southern Canada and the United States (except perhaps Florida and Texas), with a northwestward extension to northern Alaska and southern Northwest Territory.

NORTH DAKOTA RECORDS–(See Map 9.) Benson County: Leeds. Billings County: nr-139-102; 1 & 12-140-102; 35-141-102; nr-141-101; 4-143-102; 5 & 17-144-102; Mikkelson. Bottineau County: 14-163-74; 15 & 31-163-75; 16-163-76; 36-164-75; Bottineau; Lake Metigoshe. Burke County: nr-159-91.

Burleigh County: 27-138-80; McKenzie. Cass County: 11-137-50; 19-138-49; 11-138-53; 31-140-48; 10-140-49; 10-141-49; 19 & 26-141-51; 12-142-50; 10-142-51; 17-142-55; 21-143-52. Cavalier County: 12-159-57; 16-159-62; 5-159-63; 15 & 24-160-57; 35-160-63; 1 & 15-161-58;

22-162-57; 17-162-62; 7 & 20-163-57; 34-163-58; 26-163-59; 14-163-60; 31-164-58. Divide County: 6 & 36-160-96; 20-160-97; 10-163-95.

Dunn County: 9, 16 & 23-146-96; 24-147-95. Eddy County: 28-149-66. Grand Forks County: 15-150-55; 26, 31 & 35-151-50; 16-151-51; 26-151-52; 24-151-53; 25-152-50; 36-152-54; 12-152-55; 7-152-56; 10, 12 & 13-153-51; 11 & 14-154-55; Grand Forks; Honeyford; Inkster; Kelly; Larimore; Manvel; Mekinock; Thompson. Grant County: 21-136-87. Griggs County: 26-146-58.

Hettinger County: 11-134-95. McHenry County: Towner. McIntosh County: 30-129-70. McKenzie County: 34-145-102; 25-148-100; 29-149-104; 22-153-101. McLean County: 17-148-86. Mercer County: Stanton. Morton County: 20-134-80. Mountrail County: 28-154-94; 19-158-93.

Pembina County: 33-159-54; 32-159-55; 16-159-56; 11-160-51; 3-160-53; 12-161-53; 2-162-53; 21 & 30-163-55; 4 & 14-163-54; 34-164-53; Bathgate; Cavalier; Crystal; Neche; Pembina; St. Thomas; Walhalla. Ramsey County: 5-151-62; 12-152-63; 16-153-64; 18-153-65; 36-154-62; 22-157-61; 22-158-64. Ransom County: 12-135-58.

Richland County: 21-129-48; L.T.L. 5-129-52; 17-130-48; 27 & 28-130-50; 26-131-48; 34-131-50; 35-131-51; 1 & 15-132-48; 27-132-50; 34-132-51; 9, 29 & 31-133-48; 24-133-50; 19-133-51; 9-133-52; 32-134-49; 34-134-50; 17-136-50. Rolette County: 4-162-73; 30-163-71; 36-164-73. Sargent County: 3-130-57. Sheridan County: 31-145-75. Sioux County: 15-129-81. Slope County: 24-134-102; 24-136-100; 17-136-102; 9-136-104.

Stark County: nr-137-91. Stutsman County: 36-140-64; 30-144-64. Traill County: 34-147-53. Walsh County: 30-155-53; 16-155-58; 7 & 9-157-52; 11, 12, 13 & 26-157-53; 22, 23 & 24-157-56; 26-158-54; 18 & 19-158-56; 24-158-59. Ward County: 19-160-88. Wells County: 33-145-73. Williams County: 17-154-95; 23-154-98.

Page 274. In the key *CHANGE rufescens* to *breviceps.*

Page 275. *CHANGE* center heading to *Polyergus breviceps* Emery. For the first and second paragraphs following this heading *SUBSTITUTE:*– Following J. Wheeler (1968) we have abandoned the Nearctic subspecies of *P. rufescens* and changed the name of the species to *Polyergus breviceps* Emery.

Page 277. Paragraph 3 line 3 *CHANGE* to:–The North Dakota slaves of *P. breviceps* are *Formica altipetens, argentea, fusca, montana, neoclara* and *subsericea.*

Page 282-283. Table I in heading *CHANGE* 29 to 34; *DELETE Acanthomyops claviger; ADD Acanthomyops coloradensis, Formica argentea, F. hewitti, F. montana, F. neorufibarbis, F. subsericea.* Table II. In heading *CHANGE* 53 to 52; to *Eastern ADD Lasius (Ch.) speculiventris*; from *Southeastern DELETE Acanthomyops parvulus*; from *Southern DELETE Formica c. montana*; from *Southwestern DELETE Formica c. lepida* and

Page 282-283 (continued)

F. neoclara; from *Western DELETE Formica marcida* and *F. neorufibarbis* and *ADD Acanthomyops coloradensis, A. occidentalis, Formica haemorrhoidalis* and *F. neoclara.*

Page 283. *DELETE* the three paragraphs of text and *SUBSTITUTE:*– The above data are summarized in Table VII (which has been revised). From this table it is obvious that most of the extraneous species reach into North Dakota from the south and west, as might be expected because of the subhumid and semi-arid climates.

REVISE Table VII to read as follows:–

TABLE VII.
THE RANGES OF NORTH DAKOTA
EXTRANEOUS SPECIES

Combined Percentages		Number of Species	Percent of Total	Combined Percentages
	Intraneous	34	40	
	Extraneous	52	60	
Northern 9	Northern	4	8	
	Eastern	4	8	Eastern 33
	Southeastern	13	25	
Southern 67	Southern	7	13	
	Southwestern	15	29	Western 46
	Western	9	17	

Page 284. *ADD* to list II *Formica montana* and *CHANGE Acanthomyops claviger* to *A. coloradensis.*

Pages 284 and 285. *ADD* to list A and its map *Lasius speculiventris. DELETE Formica marcida.*

Pages 285 and 286. *DELETE Formica c. montana* from list B and its map.

Pages 287 and 288. *DELETE Acanthomyops parvulus* from list D and its map.

Page 289. *DELETE Formica c. lepida* from the list and from the map.

Page 293. *REVISE* Table VIII to read as follows:–

Page 293 (continued)

TABLE VIII.

THE RANGES OF SPECIES WITHIN NORTH DAKOTA

Combined Percentages		Number of Species	Percent of Total	Combined Percentages
	Statewide	26	30	
	Limited	60	70	
Northern 16	Northern	8	9	
	Northeastern	6	7	Eastern 15
	Eastern	7	8	
Southern 31	Southern	9	10	
	Southwestern	17	21	Western 33
	Western	10	12	

Page 295. From the list *DELETE Acanthomyops claviger, A. parvulus* and *Formica cinerea. ADD Formica argentea, F. haemorrhoidalis, F. montana* and *F. neoclara.*

Page 296. From the Wooded Area list *DELETE Formica marcida; ADD Camponotus nearcticus, Formica fusca* and *F. subsericea.* From the No Marked Preference list *DELETE Camponotus nearcticus, Formica fusca* and *F. neoclara.* To the final list *ADD Lasius speculiventris* and *Formica hewitti.*

Page 297. Paragraph 2 *CHANGE* first two sentences to:–If the species with too few records and the species with no marked preference are not counted, 54 species show a marked habitat preference: 37 species (69%) prefer grassland, 3 (4%) prefer grassland-woodland ecotone and 15 (28%) prefer woodlands.

Pages 297-298. *DELETE* the entire section SUBSPECIES.

Page 303. This page has not been revised. Therefore all species of *Acanthomyops* and all species of the *fusca* group of *Formica* should be ignored.

Pages 304-308. GLOSSARY. *ADD:–*

ACIDOPORE, the circular aperature at the posterior end of the gaster in the subfamily Formicinae; it is typically fringed with hairs. It was formerly called the "cloacal orifice."

EPISTERNUM (plural, EPISTERNA), the large lateral sclerite of the worker thorax, which appears to extend from the mesonotum to the mesocoxa.

Pages 304-308 (continued)

OCULAR INDEX, maximum diameter of eye X100 ÷ width of head.
SCAPE INDEX, length of the scape X100 ÷ width of head.
SPINASTERNITE, sclerite of metasternum characterized by the presence of a central spinasternal cavity.
STERNUM, the ventral side of the thorax.

Pages 309-315. *ADD:*–

aerata (ā'uh-rā''tuh) L. *aeratus* covered with brass or bronze
argentea (är-jen''tē-uh) L. *argenteus* silvery
cerasi (ser''u-sī) L. *cerasus* cherry-tree
Conomyrma (kō'nō-mûr''muh) Gr. *konos* cone + Gr. *myrmos* ant
gnava (nā''vuh) L. *gnavus* = *navus* busy, active
haemorrhoidalis (hem'ur-oid''a-lis) Gr. *haima* blood + Gr. *-rrhoos* from *rhain* to flow + L. *-alis* pertaining to
hewitti (hū''it-ī) Gen. of *hewittus* Lz. of surname of C.G. Hewitt, Canadian entomologist (1885-1920)
insana (in-sā''nuh) L. *insanus* insane
occidua (ok-sid''ū-uh) L. *occiduus* western
occulta (o-kul''tuh) L. *occultus* hidden, concealed
pacifica (pa-sif''i-kuh) Lz. of Pacific
pallidefulva (pa'li-dē-ful''vuh) L. *pallide* adverb of *pallidus* pale + L. *fulvus* tawny
pilicornis (pī'li-kôr''nis) L. *pilus* hair + L. *cornu* horn + L. *-is* having
sibylla (si-bil''luh) Gr. & L. *sibylla* a prophetess
speculiventris (spek'ū-li-ven''tris) L. *speculum* mirror + L. *venter* belly + L. *-is* having
subelongata (sub'ē-lôn-gā''tuh) L. *sub-* somewhat + L. *elongatus* prolonged
subpolita (sub'po-lī''tuh) L. *sub-* somewhat + L. *politus* polished
subsericea (sub'sē-rish''uh) L. *sub-* somewhat + L. *sericeus* silky
xerophila (zir-of''i-luh) Gr. *xeros* dry + Gr. *-phila* loving

CORRECTIONS

Page 4. Last paragraph, lines 4 and 6 *CHANGE* parastic to parasitic.

Page 11. Paragraph 4, last line *CHANGE* affected to effected.

Page 14. Last paragraph, line 4 *CHANGE* compliment to complement.

Page 18. Last line *CHANGE* vertiable to veritable.

Page 26. Paragraph 5, line 4 *CHANGE* organism to organisms.

Page 36. Paragraph 2 *DELETE* Chloroform is highly flammable.

Page 43. Last paragraph, line 8 *CHANGE* res s to rests.

Page 46. Paragraph 2, last line *CHANGE* #00 to #000.

Page 48. Paragraph 6, last line *DELETE* and chloroform are and *SUBSTITUTE* is.

Page 58. Legend for map *CHANGE* Fig. II-2 to Fig. III-2.

CORRECTIONS (continued)

Page 69. *CHANGE Mentzelia disperma* to *Mentzelia dispersa*. To plant list *ADD* ball cactus *Mamillaria missouriensis* Cactaceae.

Page 94. Under 12a after Psammophore present *ADD* (see 14a);.

Page 111. Line 2 *CHANGE* harvesing to harvesting.

Page 124. Paragraph 4 line 6 *CHANGE* locomation to locomotion.

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