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PREDACEOUS-SCAVENGER ANTS IN UTAH

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Introduction

During the last twenty years the Brigham Young University Department of Zoology and Entomology has sponsored extensive field surveys throughout Utah to collect parasitic arthropods. In most instances this involved trapping the host. While in the traps many small rodents were preyed upon by ants, especially during the night. This report is a summary of data accumulated over the years on the predaceous activities of these ants. Those which we have considered as predaceous-scavengers in the following pages are arranged first in phylogenetic sequence, then alphabetically with dates of collection, localities, numbers of specimens, and prey associates listed by specific name (Table 1).

Our use of the term predaceous-scavenger refers to those ants for which we have actual evidence of their eating on the body of a live animal or one recently killed. It does not include ants in defensive or protective action.

In this study rodents were most often collected with Museum Special snap traps. Traps were set out and baited in early evening and retrieved early the following morning. Occasionally a trapline was checked during the night. When animals were found with ants eating them, the ants were placed in a paper bag along with the prey. Cotton soaked in chloroform was used to kill the ants which were then placed in vials containing 70 percent ethyl alcohol, and a label showing field number, locality, prey, date and collector was added. Further details on all collections were recorded in a field book.

All ants were identified by Dr. A. C. Cole, University of Tennessee, to whom we are grateful for this courtesy. During periods of the natural history surveys involving parasitic arthropods, some research projects were supported by the National Institutes of Health (Contracts E-103, E-1273, and AI-01273-8). Gratitude is expressed for this support. In the main, however, the collections were accumulated by field surveys supported by the Brigham Young University Department of Zoology and Entomology. Students and colleagues too numerous to mention have been associated with the field operations. Their valuable services are greatly appreciated.

Literature Review

The only extensive studies of ants in Utah are by Rees and Grundmann (1940) of the University of Utah, Cole (1942) of the University of Tennessee, and Olsen (1934) of Colorado State Univer-

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TABLE 1: Alphabetical listing of species of predaceous-scavenger ants in Utah showing dates of collection, localities, numbers of specimens, and prey.

Species of Ant	Date	Specific Locality & County		Prey
Acanthomyops claviger	24/6/51	Joy, Juab	9	*Perognathus longimembris*
Aphenogaster subterranea occidentalis	24/6/53	Blacksmiths Fork R.S., Cache	10	*Peromyscus maniculatus*
" " "	12/7/52	Morgan, Morgan	20	" "
" " valida	20/6/52	Locomotive Spgs., Box Elder	8	*Perognathus parvus*
" " "	17/7/53	Pine Valley, Washington	25	*Peromyscus maniculatus*
Camponotus sp.	1/7/53	Currant Creek, Wasatch	6	" "
" *herculeanus modoc*	27/7/60	Scofield, Carbon	5	" "
" " "	1/8/51	Mt. Pleasant, Sanpete	15	*Eutamias quadrivittatus*
" " "	21/8/51	Pleasant Creek, Sanpete	3	*Peromyscus maniculatus*
" *vicinus*	11/6/53	Bridgeport, Daggett	15	" "
" "	18/6/52	Lucin, Box Elder	5	*Dipodomys microps*
" "	10/7/58	Dead Horse Point, Wayne	5	*Peromyscus maniculatus*
" "	27/7/51	Mercur, Tooele	1	" "
" "	30/7/58	Koosharem, Sevier	1	*Eutamias quadrivittatus*
" "	1/8/51	Mt. Pleasant, Sanpete	6	*Peromyscus maniculatus*
" "	7/8/52	Torrey, Wayne	3	" "
" "	10/8/52	Paradise Valley, Sevier	34	" "
" "	12/8/53	Callao, Juab	3	" "
" "	13/8/53	"	5	" *truei*
" "	14/8/53	Gandy, Millard	2	" *maniculatus*
" "	"	"	2	*Dipodomys ordii*
" "	7/9/51	Navajo Wells, Kane	1	*Peromyscus truei*
" *sansbeanus torrefactus*	28/8/53	Mexican Water, San Juan	1	" *crinitus*
Crematogaster depilis	17/4/52	Beaver Dam Wash., Washington	19	" *eremicus*
" "	"	"	1	*Onychomys torridus*
" "	7/7/60	Pleasant Creek, Wayne (Floral Ranch)	100	*Eutamias* sp.
" "	5/9/51	Toquerville, Washington	2	*Peromyscus eremicus*
" "	"	"	10	*Perognathus parvus*
" *lineolata emeryana*	28/5/53	Chimney Rock Pass, Utah	3	*Peromyscus maniculatus*
" " "	10/7/52	Minersville, Beaver	38	" "
" " "	13/8/53	Callao, Juab	16	*Lepus californicus*
" " "	20/8/52	Locomotive Spgs., Box Elder	2	*Peromyscus maniculatus*

Species of Ant	Date	Specific Locality & County		Prey
" *punctulata*	7/6/55	Montezuma Creek, San Juan	13	" "
" "	15/7/53	Diamond Valley, Washington	25	" "
" "	"	"	20	" *eremicus*
" "	7/9/51	Navajo Wells, Kane	8	*Dipodomys ordii*
" *minutissima*	15/7/53	Diamond Valley, Washington	5	*Peromyscus eremicus*
" *mormonum*	14/8/58	Frisco, Beaver	25	" *maniculatus*
" "	27/8/58	Swasey Spgs., Millard	12	" *truei*
" "	29/8/58	Joy, Juab	3	*Perognathus parvus*
" "	"	Koosharem, Sevier	6	*Peromyscus maniculatus*
Dorymyrmex bicolor	10/7/58	Adairville, Kane	5	" "
" "	12/8/53	Callao, Juab	5	" "
" *pyramicus*	1/4/49	Provo, Utah	15	*Rattus norvegicus*
" "	10/6/60	Hanksville, Wayne	35	*Perognathus parvus*
" "	10/6/55	Hite, Garfield	25	*Peromyscus crinitis*
" "	26/6/52	Kingston, Piute	9	" *maniculatus*
" "	2/7/60	Goblin Valley, Emery	50	" "
" "	13/7/53	Rockville, Washington	40	*Dipodomys ordii*
" "	15/7/53	Diamond Valey, Washington	6	*Perognathus formosus*
" "	22/7/51	Yuba Reservoir, Sanpete	30	*Dipodomys microps*
" "	7/8/52	Torrey, Wayne	20	*Peromyscus maniculatus*
" "	13/8/51	Duchesne, Duchesne	20	" "
" "	13/8/58	Desert Range Exp. Sta., Millard	1	*Dipodomys microps*
" "	14/8/51	Dinosaur Nat. Mon., Uintah	64	*Peromyscus maniculatus*
" "	14/8/58	Frisco, Beaver	8	*Perognathus* sp.
" "	20/8/52	Fruita, Wayne	50	*Ammospermophilus leucurus*
" "	22/8/52	Roosevelt, Duchesne	14	*Peromyscus maniculatus*
" "	"	"	33	*Dipodomys ordii*
" "	"	Huntington, Emery	15	" "
" "	5/9/51	Toquerville, Washington	5	*Peromyscus eremicus*
Formica sp.	10/6/53	Red Creek, Daggett	2	*Reithrodontomys megalotis*
" *cinerea lepida*	26/4/52	Lehi, Utah	1	" "
" " "	8/6/55	Montezuma Creek, San Juan	74	*Dipodomys ordii*
" *criniventris*	10/8/52	Paradise Valley, Sevier	5	*Peromyscus maniculatus*
" *fusca*	17/8/53	Pine Valley, Washington	5	" "
" "	24/9/53	Pleasant Creek, Sanpete	15	*Thomomys talpoides*

Species of Ant	Date	Specific Locality & County		Prey
" *integra haemorrhoidalis*	23/6/58	Deep Creek, Daggett	1	*Microtus* sp.
" " "	27/7/51	Mercur, Tooele	105	*Peromyscus maniculatus*
" " "	"	"	60	*Reithrodontomys megalotis*
" " "	29/7/60	Scofield, Carbon	4	*Eutamias quadrivittatus*
" *limata*	31/7/58	Koosharem, Sevier	3	*Peromyscus maniculatus*
" "	"	Adairville, Kane	2	*Dipodomys ordii*
" *neorufibarbis gelida*	1/7/52	Geyser Pass, LaSal Mts., San Juan	2	*Ochotona princeps*
" " "	8/8/58	Mt. Timpanogos, Emerald Lake, Utah	3	*Peromyscus maniculatus*
" " "	13/8/53	Callao, Juab	20	" "
" *neoclara*	10/6/60	Hanksville, Wayne	35	" "
" *perpilosa*	7/6/60	Pleasant Creek, Wayne	25	" "
" "	10/6/60	Cottonwood Canyon, Kane	6	" "
" "	30/6/60	San Raphael River, Emery	100	" "
" *pruinosa*	18/6/52	Lucin, Box Elder	6	*Dipodomys ordii*
" "	12/7/52	Morgan, Morgan	27	*Peromyscus maniculatus*
" *obscuripes*	12/6/53	Radosavich Ranch, Daggett	15	" "
" "	24/6/53	Monte Cristo R.S., Rich	10	*Eutamias quadrivittatus*
" "	31/7/58	Koosharem, Monroe Mt., Sevier	6	*Peromyscus maniculatus*
" "	21/8/52	Randolph, Rich	5	*Perognathus parvus*
Iridomyrmex pruinosum analis	7/6/55	Montezuma Creek. San Juan	5	*Ammospermophilus leucurus*
" " "	8/7/60	Bluff, San Juan	13	*Eutamias umbrinus*
" " "	1/9/50	Moab, Grand	1	*Neotoma lepida*
Lasius sp.	4/7/55	Provo, Utah	1	California quail
" *alienus*	17/7/53	Pine Valley, Washington	5	*Peromyscus maniculatus*
" *crypticus*	7/6/60	Pleasant Creek, Wayne	50	" "
" "	25/6/53	Woodruff, Rich	27	*Spermophilus lateralis*
" "	1/7/52	Geyser Pass, LaSal Mts., San Juan	6	*Thomomys talpoides*
" "	28/8/53	Mexican Water, San Juan	35	*Peromyscus maniculatus*
" *niger*	8/5/60	Pleasant Creek, Wayne	50	" "
" "	23/5/53	Lucin, Box Elder	25	*Reithrodontomys megalotis*
" "	8/6/60	Pleasant Creek, Wayne	50	*Marmota flaviventris*
" "	18/6/53	Woodland, Wasatch	10	*Zapus princeps*
" "	11/7/53	Pink Dunes, Kane	63	*Dipodomys ordii*
" "	9/8/52	Elkhorn R.S., Thousand Lake Mt., Wayne	2	*Peromyscus maniculatus*
" "	27/8/53	Red Mesa, San Juan	50	*Dipodomys ordii*

Species of Ant	Date	Specific Locality & County		Prey
" *sitkaensis*	7/6/60	Pleasant Creek, Wayne	38	*Peromyscus truei*
" "	10/6/53	Red Creek, Daggett	10	" *maniculatus*
" "	2/7/53	Wallsburg, " Wasatch	9	*Eutamias quadrivittatus*
" "	"	"	20	*Peromyscus maniculatus*
" "	23/7/53	Koosharem, Monroe Mt., Sevier	20	" "
" "	27/7/60	Scofield, Carbon	50	" "
" "	2/8/51	Mt. Pleasant, Sanpete	30	" "
" "	22/8/51	Aspen Grove, Mt. Timpanogos, Utah	1	" "
Leptothorax muscorum	7/8/58	Emerald Lake, Mt. Timpanogos, Utah	8	" "
Monomorium minimum	9/6/51	Huntington, Emery	2	*Dipodomys ordii*
" "	11/7/52	Echo, Summit	6	*Peromyscus maniculatus*
" "	13/8/53	Callao, Juab	100	" *truei*
Myrmica brevinodis discontinua	17/7/53	Pine Valley, Washington	5	*Microtus montanus*
" " "	27/7/60	Scofield, Carbon	5	*Peromyscus maniculatus*
" " "	22/8/52	Laketown, Rich	9	*Microtus montanus*
" *lobicornis fracticornis*	12/6/53	Radosavich Ranch, Daggett	5	*Peromyscus maniculatus*
" " "	1/7/53	Currant Creek, Wasatch	4	" "
" " "	17/7/53	Pine Valley, Washington	5	" "
" " "	28/7/60	Colton, Utah	30	" "
" " "	31/7/58	Adairville, Kane	5	*Dipodomys ordii*
" " "	22/8/52	Laketown, Rich	13	*Perognathus parvus*
Myrmecocystus mexicanus hortideorum	7/6/60	Pleasant Creek, Wayne	15	*Peromyscus maniculatus*
" " "	7/6/55	Montezuma Creek, San Juan	5	" *truei*
" " "	8/6/51	Price, Carbon	1	" *maniculatus*
" " "	30/6/60	San Raphael River, Emery	50	" *crinitis*
" " "	10/7/58	Adairville, Kane	5	" *maniculatus*
" " "	15/7/53	Pine Valley, Washington	21	" *eremicus*
" " "	27/7/53	Red Mesa, San Juan	30	" *maniculatus*
" " "	10/8/52	Minersville, Beaver	1	*Neotoma lepida*
" " "	12/8/53	Callao, Juab	1	*Dipodomys microps*
" " "	26/8/53	Four Corners, San Juan	1	*Perognathus apache*
" " "	28/8/53	Mexican Water, San Juan	4	" "
" *pyramicus*	"	"	5	*Onychomys leucogaster*
" "	"	"	5	*Peromyscus boylii*
" *mojave*	23/5/53	Lucin, Box Elder	3	" *maniculatus*

Species of Ant	Date	Specific Locality & County		Prey
" "	8/6/51	Price, Carbon	3	" "
Paratrechina sp.	28/8/53	Mexican Water, San Juan	4	*Neotoma* sp.
" "	26/8/53	Four Corners, San Juan	3	*Perognathus apache*
Pheidole sp.	17/3/52	Beaver Dam Wash., Washington	1	" *longimembris*
" "	19/6/52	Lucin, Box Elder	6	" sp.
" "	12/7/52	Morgan, Morgan	2	*Eutamias minimus*
" "	15/7/53	Diamond Valley, Washington	25	*Peromyscus maniculatus*
" *ceres*	11/7/52	Echo, Summit	15	" "
" *bicarinata*	7/4/51	Navajo Wells, Kane	1	" "
" "	13/5/53	Jensen, Uintah	9	" "
" "	7/6/55	Montezuma Creek, San Juan	50	" *crinitis*
" "	8/6/55	"	18	" *truei*
" "	10/6/58	Cottonwood Creek, Kane	16	" *maniculatus*
" "	19/6/52	Lucin, Box Elder	1	*Dipodomys ordii*
" "	24/6/51	Navajo Wells, Kane	4	*Neotoma lepida*
" "	12/7/53	Short Creek, Washington	50	*Dipodomys ordii*
" "	13/7/53	Rockville, Washington	35	*Perognathus formosus*
" "	16/7/53	Diamond Valley, Washington	9	" "
" "	18/7/53	"	5	*Peromyscus maniculatus*
" "	13/8/58	Desert Range Exp. Sta., Millard	40	*Perognathus longimembris*
" "	"	"	18	*Peromyscus maniculatus*
" "	14/8/58	Frisco, Beaver	20	*Dipodomys ordii*
" "	22/8/53	Four Corners, San Juan	100	*Peromyscus truei*
" "	28/8/53	Roosevelt, Uintah	25	*Rattus norvegicus*
" "	5/9/51	Toquerville, Washington	30	*Neotoma lepida*
" "	6/9/51	Grafton, Washington	15	*Perognathus parvus*
" "	8/9/51	Adairville, Kane	15	*Dipodomys ordii*
" *dentata*	5/9/51	Toquerville, Washington	5	*Perognathus parvus*
" *hyatti*	11/6/58	Adairville, Kane	1	*Peromyscus maniculatus*
" "	13/7/53	Rockville, Washington	20	" *eremicus*
" "	6/9/51	Grafton, Washington	4	*Dipodomys merriami*
Pogonomyrmex occidentalis	15/6/53	Radosavich Ranch, Daggett	10	*Eutamias* sp.
" "	8/9/51	Adairville, Kane	5	*Dipodomys ordii*
Solenopsis molesta validiuscula	9/6/51	Soldier Summit, Wasatch	12	*Spermophilus armatus*
" " "	10/6/53	Jensen, Uintah	5	*Dipodomys ordii*

Species of Ant	Date	Specific Locality & County	Prey	
" " "	4/7/55	Provo, Utah	11	California quail
" " "	15/7/53	Diamond Valley, Washington	5	*Peromyscus maniculatus*
" " "	6/9/51	Navajo Wells, Kane	14	*Neotoma lepida*
" " "	9/11/51	Rush Valley, Tooele	1	" "
" " "	23/2/52	Beaver Dam Wash, Washington	2	" "
Tapinoma sessile	9/6/55	Kigalia R.S., San Juan	50	*Eutamias minimus*
" "	10/6/60	Hanksville, Wayne	50	*Peromyscus maniculatus*
" "	12/6/53	Radosavich Ranch, Daggett	5	" "
" "	20/6/52	Locomotive Springs, Box Elder	5	*Neotoma lepida*
" "	4/7/55	Provo, Utah	10	California quail
" "	14/7/52	Echo, Summit	25	*Peromyscus maniculatus*
" "	14/7/53	Leeds, Washington	50	" "
" "	17/7/53	Pine Valley, Washington	17	*Microtus montanus*
" "	18/7/53	Enoch, Iron	10	*Dipodomys ordii*
" "	2/8/53	Johnny Star Flat, Duchesne	25	*Peromyscus maniculatus*
" "	"	"	27	*Eutamias minimus*
" "	5/9/51	Toquerville, Washington	5	*Perognathus parvus*

sity. Although these studies include a large listing of ant species for the state, little is mentioned about their feeding habits.

Creighton's work (1950) on the ants of North America makes general references to food habits for some species, and in a few instances gives specific reference to others. Several direct references involve species that we have observed, whereas others relate to species not known from Utah. Some of Creighton's data related to scavenger-predaceous species are quoted below, followed by our comments.

> "*Platythyrea punctata* (F. Smith): The workers are active and forage singly. The colonies are small consisting of from fifty to two hundred individuals. It is both carnivorous and predatory" (p. 34).

This species occurs in the extreme southern part of the United States.

> "*Cerapachys augustae* Wheeler: It is virtually certain that these ants are carnivorous, and it is probable that they are predaceous" (p. 58).

The range of this species is from western Texas to southern Arizona.

"At certain seasons these insects [ants of subfamily Dorylinae] become nomadic, and the entire colony sets out on an expedition which becomes a series of raids against animals that may happen to be in the vicinity . . . although there has been much exaggeration of the capacity of these insects for attacking large vertebrates. Undoubtedly, they would do so if given the opportunity, but unless the animal was badly crippled or comatose, it could easily avoid the attack. The main victims of these raids are other insects which are secured in prodigious numbers" (p. 60).

"There is a persistent belief that in the days when the West was wilder than it is now, Indians would sometimes stake out a human victim across a nest of *Pogonomyrmex*. If this was actually done it would be hard to imagine a more excruciating death" (p. 110).

We observed *Pogonomyrmex occidentalis* demonstrating the scavenger-predaceous habit in only two instances, yet it is one of the most widely distributed ants in Utah. It has a ferocious habit of attacking and stinging a victim as a protective action. The sting is painful to humans.

> "Despite their preference for a graminivorous diet, many species of *Pheidole* will accept other food as well. They seem less attracted to honey-dew than do many ants but will often feed voraciously on animal tissue when the opportunity offers" (p. 161).

We have records of four species of *Pheidole* being scavenger-predaceous in habit. They are *P. ceres*, *P. bicarinata*, *P. dentata* and *P. hyatti*.

> "Because of their omnivorous habits, they [*Solenopsis geminata* and *S. saevissima*] are always turning up in unexpected situations. They have been known to damage the buds and tender twigs of young fruit trees and kill quail which are too young to leave the nest" (p. 227).

We observed *Solenopsis molesta validiuscula* as a scavenger-predator. These ants are the popularly known Fire Ants, a name

given to them because of their painful sting. We included this reference because Creighton mentions the term omnivorous; to kill does not mean the ant is a predator or scavenger.

> "The ants [*Dorymyrmex pyramicus* and *D. bicolor*] are very active and predaceous but will feed on honey-dew when thy can get it. They have a strong odor of butyric acid which is particularly noticeable when they are crushed" (p. 348).

Dorymyrmex pyramicus and *D. bicolor* definitely are predaceous-scavengers.

> "Of *Myrmecocystus* . . . a considerable proportion of the species . . . appear to be carnivorous" (p. 354).

We found this to be true for *M. mexicanus hortideorum*, *M. pyramicus* and *M. mojave*.

Results

The taxonomic arrangement of subfamilies and genera follows that of Creighton (1950). In a few instances in the list below, only generic determination was possible.

Subfamily Myrmicinae

Myrmica brevinodis discontinua Weber
Myrmica lobicornis fracticornis Emery
Pogonomyrmex occidentalis (Cresson)
Aphenogaster subterranea valida Wheeler
Aphenogaster subterranea occidentalis (Emery)
Pheidole sp.
Pheidole ceres Wheeler
Pheidole bicarinata Mayr
Pheidole dentata Mayr
Pheidole hyatti Emery
Crematogaster depilis Wheeler
Crematogaster lineolata emeryana Creighton
Crematogaster punctulata Emery
Crematogaster minutissima Mayr
Crematogaster mormonum Emery
Monomorium minimum (Buckley)
Solenopsis molesta validiuscula Emery
Leptothora muscorum (Nylander)

Subfamily-Dolichoderinae

Iridomyrmex pruinosum analis (E. Andre)
Dorymyrmex bicolor (Wheeler)
Dorymyrmex pyramicus (Roger)
Tapinoma sessile (Say)

Subfamily-Formicinae

Camponotus sp.
Camponotus herculeanus modoc Wheeler
Camponotus sansabeanus torrefactus Wheeler
Camponotus vicinus Mayr
Paratrechina sp.
Lasius sp.
Lasius alienus Mayr
Lasius crypticus Wilson
Lasius niger Mayr
Lasius sitkaensis Pergande
Acanthomyops claviger (Roger)
Myrmecocystus mexicanus hortideorum McCook
Myrmecocystus mojave Wheeler
Myrmecocystus pyramicus Smith
Formica sp.
Formica cinerea lepida Wheeler
Formica criniventris Wheeler
Formica fusca Linné
Formica integra haemorrhoidalis Emery
Formica limata Wheeler
Formica neoclara Emery
Formica neorufibarbis gelida Wheeler
Formica perpilosa Wheeler
Formica pruinosa Wheeler
Formica obscuripes Forel

Table 1 lists the species collected, dates of collection, specific localities (towns or other geographic locations), counties, numbers of specimens collected, and animals upon which the ants were feeding. Dates of collections are arranged by day, month and year. When a species was collected several times during the year, the dates are listed in chronological order.

Six species were found only in the Great Basin, fourteen in the Colorado River Drainage Basin, and twenty-four species were generally distributed in both basins. See Table 2.

For the most part, small rodents were the animals upon which the ants were observed feeding. In a few instances rabbits were involved. Occasionally small ground-dwelling birds were caught and killed in snap traps, and ants preyed upon them. In other cases ants invaded the nests of rodents and attacked their young.

TABLE 2

GEOGRAPHIC DISTRIBUTION

Great Basin Only	Colorado River Basin Only	Both Basins
Acanthomyops claviger	*Camponotus sansabeanus torrefactus*	*Aphenogaster subterranea valida*
Aphenogaster subterranea occidentalis	*Crematogaster depilis*	*Camponotus vicinus*
Crematogaster lineolata emeryana	*Crematogaster punctulata*	*Camponotus herculeanus modoc*
Crematogaster mormonum	*Crematogaster minutissima*	*Dorymyrmex bicolor*
Formica pruinosa	*Formica criniventris*	*Dorymyrmex pyramicus*
Pheidole ceres	*Formica neoclara*	*Formica cinerea lepida*
	Formica perpilosa	*Formica fusca*
	Iridomyrmex pruinosum analis	*Formica integra haemorrhoidalis*
	Lasius alienus	*Formica limata*
	Myrmecocystus pyramicus	*Formica neorufibarbis gelida*
	Paratrechina sp.	*Formica obscuripes*
	Pheidole dentata	*Lasius crypticus*
	Pheidole hyatti	*Lasius niger*
	Pogonomyrmex occidentalis	*Lasius sitkaensis*
		Leptothorax museorum
		Monomorium minimum
		Myrmica brevinodus discontinua
		Myrmica lobicornis fracticornis
		Myrmecocystus mexicanus hortideorum
		Myrmecocystus mojave
		Pheidole sp.
		Pheidole bicarinata
		Solenopsis molesta validiuscula
		Tapinoma sessile

Discussion

In the several studies of ants of Utah the schemes of classification have varied. In so far as we can determine from the literature, approximately 126 kinds of ants combined under species, subspecies, and a variety of other categories are known for Utah. We list 42 kinds representing 41 species in 17 genera. The genus *Paratrechina* was the only one for which specific identification could not be made.

The following 23 species and subspecies and one genus are herein reported from Utah for the first time: *Acanthomyops claviger*, *Aphaenogaster subterranea valida*, *Camponotus vicinus*, *Crematagaster depilis*, *C. lineolata emeryana*, *C. punctulata*, *C. minutissima*, *Formica cinerea lepida*, *F. integra haemorrhoidalis*, *F. limata*, *F. neorufibarbis gelida*, *F. neoclara*, *Lasius alienus*, *L. crypticus*, *Leptothorax muscorum*, *Myrmica brevinodis discontinua*, *Myrmecocystus pyramicus*, *M. mojave*, *Paratrechina* sp., *Pheidole ceres*, *P. bicarinata*, *P. dentata*, and *P. hyatti*. It is unusual to have more than half of our collections represent new distribution records.

In many years of field surveys, and especially those involved with parasitic arthropod investigations, we have sampled most of the major types of ecological situations which occur in Utah. This may account in part for the many new distributional records.

Of the approximate 126 kinds of ants previously reported, 19 have been found by us to be predaceous-scavengers. This indicates that the 107 other kinds do not have this habit, or we have failed to discover such activities for these species. Although the latter is possible, it seems unlikely when one considers the number of years involved in our surveys and the thousands of animals trapped in varying types of habitats.

One should not classify an ant as a predaceous-scavenger kind if the ant simply assumes a defensive or protective action. Such a defensive pose is taken when *Pogonomyrmex occidentalis* is disturbed. One of the most abundant ants in Utah, this insect is responsible for mounds scattered throughout the valleys and foothills. Yet, our records show only two instances where this species was observed consuming animal flesh.

Those ants which we consider as predaceous-scavengers and are widespread in Utah are *Camponotus vicinus*, *Dorymyrmex pyramicus*, *Lasius niger*, *Myrmecocystus mexicanus hortideorum*, *Pheidole bicarinata*, and *Tapinoma sessile*. Some forms, such as *Iridomyrmex pruinosum analis* which was encountered only in the southeastern part of Utah in lowland desert situations, could be considered geographically restricted. Creighton (1950:343) stated that "the northern limit of the range appears to lie in southern Idaho." Although not restricted to any part of Utah, *Lasius sitkaensis* occurs at higher elevations on mountains, in canyons and in valleys.

There is little evidence that any of the ants observed in this study are prey-specific in their association. We have trapped a number of species of rodents in high mountain situations many times over the

years. At these higher elevations the numbers of species of predaceous-scavenger ants are comparatively fewer than at lower elevations and in the desert.

Geographic distributional records were included only for our collections. Seasonal collecting on a year-round schedule in localities ecologically similar and at similar altitudes is desirable. Collection data certainly are not complete, for example, when records for *Pogonomyrmex occidentalis* are known only from two localities at opposite ends of the state. The same is true for other species such as *Formica neorufibarbis gelida* which shows only an extreme east and west distribution.

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