

**Ant Communities of a Section of the Sagebrush
Semi-Desert in Idaho, with Special Reference
to the Vegetation (Hymenop.: Formicidae).**

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An area one-tenth of a mile square was selected in the sagebrush semi-desert near Twin Falls, Idaho, in which to conduct a survey of the principal ant communities. This area consisted of three distinct parts; firstly, a ledge of overhanging rocks along the north side of the square; secondly, a small stream along the south side; and thirdly, an intervening, somewhat level, sandy area. The principal vegetation of each of these three units is listed in table 1. *Agropyron repens* (L.) Beauv.

TABLE 1.

VEGETATION OF THREE SEMI-DESERT BIOTIC COMMUNITIES.

The Solenopsis molesta-Agropyron repens Community.

Frequent.	Scarce.
<i>Agropyron repens</i> (L.) Beauv.	<i>Bromus tectorum</i> L.
<i>Cirsium arvense</i> (L.) Scop.	<i>Chrysothamnus graveolens</i> (Nutt.) Greene

The Lasius niger americanus-Salsola pestifer Community.

Frequent.	Scarce.
<i>Salsola pestifer</i> A. Nels.	<i>Atriplex rosea</i> L.
<i>Aster</i> sp.	

The Formica subpolita-Artemisia tridentata Community.

Frequent.	Scarce.
<i>Artemisia tridentata</i> Nutt.	<i>Agropyron repens</i> (L.) Beauv.
<i>Chrysothamnus graveolens</i> (Nutt.) Greene	
<i>Bromus tectorum</i> L.	

(Bunchgrass) dominated along the rocky ledge, *Salsola pestifer* A. Nels. (Russian Thistle) on the stream margin, and *Artemisia tridentata* Nutt. (Sagebrush) in the central area. The overhanging ledge of rocks provided a shaded habitat in the afternoon and prevented the rapid evaporation of soil moisture. The soil of this portion was a sandy loam. Along the stream the soil was very moist and consisted of a rich loam, while in the unshaded central area it was dry and sandy.

THE BIOTIC COMMUNITIES *

1. *The Solenopsis molesta-Agropyron repens Community*

The ant *Solenopsis molesta* Say dominated in this community in which there were a few colonies each of *Crematogaster lineolata* Say, *Monomorium minimum* Buckley, *Pheidole vinelandica longula* Emery, *Pheidole sp.*, and *Camponotus hyatti* Emery. (Table 2.) One colony of a species of *Myrmica* was

TABLE 2.

ANTS OF THREE SEMI-DESERT BIOTIC COMMUNITIES.

The Solenopsis molesta-Agropyron repens Community.

<i>Solenopsis molesta</i> Say.....	13†
<i>Crematogaster lineolata</i> Say	6
<i>Monomorium minimum</i> Buckley	5
<i>Pheidole vinelandica longula</i> Emery	4
<i>Camponotus hyatti</i> Emery	2
<i>Pheidole sp.</i>	2
<i>Myrmica sp.</i>	1

The Lasius niger americanus-Salsola pestifer Community.

<i>Lasius niger americanus</i> Emery	22†
<i>Solenopsis molesta validiuscula</i> Emery	17
<i>Tapinoma sessile</i> Say	12
<i>Camponotus maculatus vicinus nitidiventris</i> Emery.....	8
<i>Formica neogagates neogagates</i> Emery.....	6
<i>Leptothorax curvispinosus rugatulus</i> Emery.....	4
<i>Pheidole sp.</i>	4
<i>Lasius umbratus mixtus aphidicola</i> Walsh.....	3
<i>Formica fusca</i> var.	1
<i>Lasius niger sitkaënsis</i> Pergande.....	1

The Formica subpolita-Artemisia tridentata Community.

<i>Formica subpolita</i> Mayr	46†
<i>Pogonomyrmex occidentalis</i> Cress	18
<i>Formica rufa obscuripes</i> Forel	14
<i>Formica fusca neorufibarbis</i> Emery	12
<i>Formica fusca</i> var.	4
<i>Formica sanguinea subnuda</i> Emery	2
<i>Formica pallide-fulva</i> var.	1

also represented. All of the above ants were beneath flat rocks.

2. *The Lasius niger americanus-Salsola pestifer Community*

Lasius niger americanus Emery was the dominant ant, while

* Expressed in terms of the dominant ant and the dominant plant.

† The figures indicate the number of colonies.

Solenopsis molesta validiuscula Emery, *Tapinoma sessile* Say, and *Camponotus maculatus vicinus nitidiventris* Emery were frequent. Less commonly represented were *Formica neogagates neogagates* Emery, *Leptothorax curvispinosus rugatulus* Emery, *Pheidole* sp., and *Lasius umbratus mixtus aphidicola* Walsh. *Formica fusca* var. and *Lasius niger sitkaënsis* were rare. (Table 2.) All of the colonies were found beneath flat rocks.

3. The *Formica subpolita*-*Artemisia tridentata* Community

The most abundant ant in this community was *Formica subpolita* Mayr. *Pogonomyrmex occidentalis* Cresson and *Formica rufa obscuripes* Forel were common, while *Formica fusca neorufibarbis* Emery and *Formica fusca* var. were less frequent, and *Formica sanguinea subnuda* Emery and *Formica pallide-fulva* var., rare. (Table 2.)

Formica obscuripes was represented by mounds of detritus formed around clumps of sagebrush, and pebble mounds of *Pogonomyrmex occidentalis* were abundant in the brome grass area between the shrubs. The remaining species were all beneath scattered stones.

DISCUSSION.

From a study of this nature we see that the habitat of a species of ant is greatly determined by the physical factors of the environment, or the vegetational equivalent. A culmination of factors acting upon the existing vegetation determines whether or not it shall continue to remain in the habitat; likewise, this same group of factors directly, through contact with the ant colonies, or indirectly, through the vegetation types, affects the entire ant fauna of a given community. It determines the quantitative as well as the qualitative composition of the area, and, unless the establishment of the ants is of a contingent nature, it also determines whether or not there shall be this establishment.

The food relations of these associated ants are of prime importance. The members of the genus *Pheidole*, of which three species are represented in our community, are nutritionally dependent upon seeds from adjoining vegetation. This is also true of *Pogonomyrmex occidentalis* and to a lesser extent of *Formica subpolita*. An abundance of annual and perennial

grasses with readily available seeds is an enticement to the establishment, and a factor influencing the continued existence, of the granivorous species of ants. The presence of sagebrush lends itself to the rapid establishment of *Formica obscuripes*. In such a habitat food is rather easily accessible.

It is of consequence that the physical and biotic nature of the semi-desert region is continually, and often rapidly, changing. Vegetation increases and decreases in size, abundance, and composition, annual and seasonal temperatures and precipitation suffer great fluctuations, the nature of the soils is variable, both physically and chemically, the water courses, both surface and subterranean, deviate from their paths, and, with all this, the ant fauna changes to a remarkable extent. New forms invade the area and become established, some permanently, if they are able to cope with rapidly changing conditions, and others only temporarily. Incipient nests are founded by old colonies, some of them fortuitously extending their range into new and previously unoccupied regions, over precarious barriers of climate and topography. The investigator cannot help but observe, from year to year and from decade to decade, the physical and biotic instability of the habitat. Upon a complex of interrelated factors must an individual live, so upon another must it die. The changeability of even a single factor may "push over the dominos" and affect the last link in the chain. The ant, as an organism, is, therefore, directly or indirectly dependent upon all phases of its diversified environment. It is itself a factor producing this environment and a product of it.

An Opportunity.

It will be of interest to all workers in Biology to learn that the Council of the Biological Society of Washington, at its last meeting, has voted the granting of a special price reduction on the following of its publications: "Natural History of the District of Columbia," by W. L. McAtee, 142 pages, inset map, octavo, paper, 1918. "The International Rules of Zoological Nomenclature," 28 pp. octavo, paper, 1926. "Birds of the Washington, D. C. Region," by May Thatcher Cooke. 79 pp. octavo, paper, 1929. These can be obtained from the Society's corresponding secretary, J. S. Wade, U. S. Bureau of Entomology, Washington, D. C. Requests should be sent promptly as only a very limited number of copies remain.