TINGIDAE, NEIDIDAE (BERYTIDAE) AND PENTATOMIDAE OF THE NEVADA TEST SITE[1]

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Introduction

This report is another in the continuing series of publications concerned with the results of ecological observations of fauna at the United States Atomic Energy Commission Nevada Test Site. These reports are concerned with investigations being conducted by the Department of Zoology and Entomology of Brigham Young University in cooperation with the United States Atomic Energy Commission (Allred, *et al.*, 1963). Most of the earlier reports refer to studies of vertebrate organisms and ground-inhabiting invertebrates. Some studies have been directed to parasitic arthropods. For a recent listing of these publications refer to Allred, *et al.* (1966).

During the last several years emphasis has been given to collecting arthropods from known species of plants. The principal objective is to show the association between species of animals and plants. Although main attention has been given to collections during the flowering season, follow-up visits have also been made at other times. We are aware of the collection of a specimen in what may be termed an accidental visit by an animal organism to a species of plant. Such an accidental type of relationship we have tried to differentiate by making collections from several specimens of the plant species at separate localities.

Collections were made mostly by insect net sweeping, vigorously shaking the plant into the open net, picking organisms by hand from the plant, or severely beating larger bushes or trees while a net was held beneath the plant. Some collections were made by use of ultraviolet and incandescent light sources in specially-designed traps. They were so designed that individual specimens of species could be taken separately. Such collections were made in plant communities greatly predominated by one or two plant species.

For convenience of reference, a map to our areas of study is included (Figure 1). These subdivisions of the test site are not to be interpreted as biotic units, but they are divisions of convenience so a more accurate identification of a locality may be made. (See Allred *et al.*, 1963, for a detailed description of biotic community subdivisions.) The designation of the title "Host Plant Species" in Table I is an arbitrary term of identity on our part. Actually the insect-plant association at the time of our collection may have been a single visit. Nevertheless, this was the association we found when a collection was made at a given date.

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The classification of the Tingidae and the Neididae (Berytidae) was done by Dr. Richard C. Froeschner, Curator, Department of Entomology, at the U. S. National Museum. The Pentatomidae were identified by the late Dr. Herbert Ruckes, Department of Entomology, at the American Museum of Natural History. This latter courtesy was most likely the last service he performed, for the following week after we received his taxonomic analysis of our specimens, we learned of his untimely death. We are indeed grateful to these men for their help in the identifications. Instrumental in making some of the collections were Clyde M. Pritchett and Jose M. Merino, graduate students at Brigham Young University. We were assisted in plant classification by Dr. Janice C. Beatley, Curator of the Nevada Test Site Herbarium, and a member of the test site ecology staff from the University of California at Los Angeles.

Results

The data are arranged in tabular form. Table I comprises the Tingidae; Table II, the Neididae (Berytidae); and Table III, the Pentatomidae.

Discussion

Tingidae

Corythucha mollicula was found on a variety of plant species. Nevertheless, the greatest numbers were collected from *Gutierrezia sarothrae* and *G. microcephala*. There seemed to be no general preference for the tingid *Corythucha sphaeralceae*. This seemed rather unusual in that during the summer of 1965 there was a rank growth of *Sphaeralcea* sp. over thousands of acres of desert land. Only one specimen of *Dictyla coloradensis* was collected, yet many *Astragalus lentiginosus* were sampled. *Gargaphia opaxcula* was the most generally distributed tingid with reference to geography and plant species association. If there were any plant preference, it may have been *Eurotia lanata*. It also had an extended seasonal occurrence, being taken in January, April, May, June, July, and August from *Eurotia lanata*. The only tingid which appeared to be host specific was *Teleonemia nigrina*, collected from *Verbena bracteata*. Drake and Ruhoff (1965) listed six host-plant species, not including sugar beets and snapdragon flowers. *Eriogonum* sp. and *Verbena* sp. are also host plants. Checked with data from the Drake-Ruhoff catalogue, all tingids listed in this report are new records for Nevada. The host-plant associations have significantly added to those already known.

Neididae (Berytidae)

As a group, the fragile hemipteran "Stilt Bugs" were widely distributed over the test site. The most abundant species was *Jalysus wickhami*. Although found on other species of plants, there was a preference for *Eriogonum inflatum*, *E. deflexum*, and *E. nodosum*. The 1965 collections were taken when these species were in flower.

Pronatocantha annulata showed no host-plant preference. It is interesting to note, however, that specimens of this species were not taken from any species of *Eriogonum*. Only three specimens of *Neides muticus* were collected. One was from *Gilia* sp., and two others from the pinyon-pine, *Pinus monophylla*.

Pentatomidae

For the most part those "Stink Bugs" taken before 1964 as listed in Table III were collected in pit-fall can traps. This type of collecting was done to obtain a sample of organisms whose habit in part or entirely confined them to ground surface travel and living in selected biotic communities. Such collecting would not reveal the specific plant association by an organism. This in part explains the blank space beneath the heading "Plant Host(s)." Subsequent to 1963 the collections of pentatomids were directed to taking specimens from the plants themselves. The most commonly encountered species, *Chlorochroa sayi*, has a wide geographic and seasonal distribution. When data from pit-fall can traps are used plus records from plants in flower, the seasonal distribution was February through September, except May and July. There are not sufficient data to indicate plant preference. One may generalize from the data at hand that this species of stink bug is more or less a lowland-basin inhabitant at the test site. On the other hand, *Thyanta rugulosa* appears to be relegated to slightly higher elevations. *Atriplex canescens* was the plant on which most specimens of this species were found. Although *Thyanta pallidovirens spinosa* was generally distributed about the test site, it did not evidence any specific plant species as a preferred host. Five additional species of pentatomids were collected, including a possible new species of *Dendrocoris*. Most collections such as *Brochymena sulcata* and *Banasa euchlora* were taken only as single specimens. Five specimens of *Dendrocoris contaminatus* and three of *Prionosoma podopioides* were collected.

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TABLE I. Collection Records for Tingidae Taken at the Nevada Test Site.

SPECIES	PLANT HOST(S)	LOCALITY	DATE	NO. OF SPECIMENS
Corythucha mollicula Osborn & Drake	*Tetradymia glabrata*	17	1 Jy 65	1
	Artemisia sp.	18	8 Jy 65	1
	Gutierrezia sarothrae	5	16 Jy 65	28
	G. microcephala	410	27 Jy 65	60
	Franseria acanthicarpa	17		4
			5 Ag 65	3
	Eriogonum deflexum	16		1
	Hymenoclea salsola	5	12 Ag 65	2
	Franseria acanthicarpa	16	19 Ag 65	8
		17	26 Ag 65	2
Corythucha sphaeralceae Drake	*Artemisia* sp.	18	8 Jy 65	7
	?			1
	Sphaeralcea sp.	12	11 Ag 65	2
		23	18 Ag 65	6
	Franseria acanthicarpa	16	19 Ag 65	1
	Sphaeralcea sp.	18	23 Ag 65	2
Dictyla coloradensis (Drake)	*Astragalus lentiginosus*	17	11 Jn 65	1
Gargaphia opacula Uhler	*Eurotia lanata*	6	17 Ag 60	2
		4	23 Ja 61	1
	Eurotia lanata	6	31 Ja 61	1
			24 Ap 61	1
			20 My 61	1
			21 Jn 61	8
	Atriplex canescens			1
	Eurotia lanata		24 Jy 61	2
	Purshia tridentata	28	28 Jy 62	1
	Eurotia lanata	16	11 Jn 65	9
	Machaeranthera leucanthemifolia			2
	Chaenactis stevioides	5	12 Jn 65	1
	Opuntia acanthicarpa	14	14 Jn 65	1
	Coleogyne ramosissima	16	11 Jn 65	1
	Acamptopappus shockleyi	6	15 Jn 65	1
	Malacothrix glabrata	401	18 Jn 65	1
	Atriplex canescens		20 Jn 65	1
	Dalea polydenia	16	19 Ag 65	1
Teleonemia nigrina Champion	*Verbena bracteata*	5	13 Jn 65	17
			Total	183

TABLE II. Collection Records for Neididae (Berytidae) Taken at the Nevada Test Site

SPECIES	PLANT HOST(S)	LOCALITY	DATE	NO. OF SPECIMENS
Neides muticus (Say)	*Gilia* sp.	12	21 Jn 60	1
	Pinus monophylla		15 Ag 65	1
			25 Ag 65	1
Pronotacantha annulata Uhler	?	5	19 O 60	1
	Bromus rubens	28	21 Jy 62	3
	Penstemon palmeri	12	14 Jy 64	8
	P. floridus	12	15 Jy 64	1
	Phacelia peirsoniana		11 Jn 65	1
	Salvia dorrii			1
	Malacothrix glabrata	17	12 Jn 65	1
	Castilleja sp.	5	13 Jn 65	1
	Oenothera californica	17	16 Jn 65	1
	Ribes sp.	12	13 Ag 65	2
Jalysus wickhami Van Duzee	*Elymus cinereus*	5	27 Jy 61	1
	Artemisia tridentata	16	31 Jy 61	1
	?	5	2 O 61	1
	Sphaeralcea ambigua	5	11 Jn 64	1
	Eriogonum inflatum	6	19 Jy 65	1
	?	23	3 Ag 65	3
	?		4 Ag 65	8
	?		5 Ag 65	1
	Eriogonum deflexum	16		5
	E. nodosum	17		1
	E. deflexum	12	6 Ag 65	2
	?	17	8 Ag 65	1
	Sphaeralcea sp.	16	11 Ag 65	1
	Eriogonum deflexum			2
	?	23	12 Ag 65	1
	Eriogonum deflexum	5		23
	?	23	15 Ag 65	1
	Eriogonum deflexum	410	16 Ag 65	46
	Eriogonum sp.	16	17 Ag 65	1
	E. deflexum		19 Ag 65	4
			20 Ag 65	1
	Eriogonum inflatum	6		6
	E. deflexum	12	23 Ag 65	1
	Chenopodium leptophyllum	18		1
	Eriogonum nodosum			2
			Total	139

TABLE III. Collection Records for Pentatomidae Taken at the Nevada Test Site

SPECIES	PLANT HOST(S)	LOCALITY	DATE	NO. OF SPECIMENS
Chlorochroa sayi Stål	?	1	15 S 60	1
	Salsola kali		19 S 60	1
	?		16 F 61	1
	Astragalus sp.	4	12 Mr 61	1
	?	1	16 Mr 61	5
	?		20 Mr 61	2
	?		27 Mr 61	4
	?		30 Mr 61	6
	?		6 Ap 61	4
	?		10 Ap 61	4
	?		17 Ap 61	1
	?		20 Ap 61	2
	?		24 Ap 61	1
	?		1 S 62	1
	?		3 S 62	1
	Stanleya pinnata	5	12 Jn 64	2
	Lepidium fremontii	9	10 Jn 65	6
	Stanleya pinnata	5	12 Jn 65	2
	Grayia spinosa	401	18 Jn 65	4
	Purshia glandulosa		20 Jn 65	1
	Chrysothamnus sp.	12	7 Ag 65	1
	Chenopodium leptophyllum	17	8 Ag 65	1
	?	23	10 Ag 65	1
	Sphaeralcea sp.	401	11 Ag 65	1
	Stanleya pinnata	5	12 Ag 65	6
			13 Ag 65	4
	?	23	15 Ag 65	2
	?		18 Ag 65	2
	Salsolia kali	5		1
	?	16	19 Ag 65	2
	Stanleya pinnata		20 Ag 65	1
	Atriplex canescens	17	25 Ag 65	1
	Stanleya pinnata	5	28 Ag 65	8
	?	23	29 Ag 65	1

Thyanta rugulosa (Say)	?	5	10 Mr 61	1
	Lycium sp.		14 Jn 61	1
	Rumex salicifolius (S)		27 Jy 61	1
	Artemisia tridentata	16	23 Jy 62	1
	?	12	25 Jy 62	1
	Purshia tridentata	28	28 Jy 62	1
	Artemisia tridentata	16	31 Jy 62	1
	?	5	20 Jy 65	1
	?	18	22 Jy 65	1
	Atriplex canescens	17	5 Ag 65	3
	?	23	12 Ag 65	1
	?		15 Ag 65	11
	Atriplex canescens	16	19 Ag 65	2
		17	25 Ag 65	21
		12		2
		5	28 Ag 65	42
Thyanta pallidovirens spinosa Ruckes	*Larrea divaricata*	401	2 Ag 62	1
	?	18	3 Ag 62	1
	Baileya pleniradiata		13 Jy 64	2
	Rumex salicifolius	12	19 Jy 64	1
	?		9 Ag 64	1
	?	16	11 Ag 64	1
	?	5	19 Jy 65	2
	?	410	21 Jy 65	3
	?	23	5 Ag 65	1
	Sphaeralcea sp.	16	11 Ag 65	1
	?	23	15 Ag 65	1
	Elymus cinereus	12	23 Ag 65	1
Banasa euchlora Stål	?	12	9 Ag 64	1
Brochymena sulcata Van Duzee	*Pinus monophylla*	18	20 Jn 65	1
Dendrocoris sp. novum (?)	*Pinus monophylla*	18	20 Jn 65	3
Dendrocoris contaminatus Uhler	*Larrea divaricata* (L)	CE	3 Ag 61	1
	Viguiera multiflora	16	19 Ag 65	1
	Larrea divaricata	5	28 Ag 65	3
Prionosoma podopioides Uhler	?	1	19 Jn 61	1
	?	1	26 Jn 61	1
	?		21 Jy 61	1
			Total	202