

Summary of insect collecting
in the North Boulder Area

1995

February 3, 1996

Virginia Scott

Entomology Section
University of Colorado Museum
Campus Box 218
Boulder CO 80309

phone (303) 492-6270
fax (303) 492-4195
scottv@spot.colorado.edu

Abstract

Insect specimens were collected from City of Boulder Open Space property north of Boulder to document some of the insect fauna that is currently living in the area. A total of 402 adult specimens were taken from two sites on four different collecting days. The specimens collected came from a wide range of insect families at many trophic levels. Several introduced species were found. Suggestions for future projects are presented.

Statement of objectives

1. To collect insects on City of Boulder Open Space property to preserve them for the scientific record and make them available to systematists.
2. To report to City of Boulder Open Space which insects were present or obviously lacking in the area.

Methods

During 1995, insect collecting on City of Boulder Open Space property was limited to two sites north of Boulder: the Schneider Property and Eagle Trailhead. Collecting occurred at the Schneider site in a mixed grassland habitat on three days using aerial nets. Collecting at the Eagle Trailhead was done on one day by both aerial netting of specimens and use of ultra violet and mercury vapor lights to attract insects. This collecting was primarily restricted to mixed grassland habitat, however, the use of light traps pulled in insects from the area surrounding the Boulder Reservoir. This collecting was done in connection with the general entomology class offered by the EPO Biology Department at University of Colorado. One attempt to collect at the Boulder Valley

Ranch Trailhead using ultra violet light was unsuccessful due to high winds and cool temperatures.

Results

A total of 402 adult insect specimens were collected, prepared, and incorporated into the University of Colorado Museum as a permanent record of the insect fauna in the area. The number of specimens per insect family are listed in Table 1.

Despite the low number of specimens taken, the most common insect families are present. Trophic levels represented include herbivores, predators, scavengers and parasites. Herbivores include nectar and pollen eating species, as well as insects that feed on leaves, roots, plant saps and boring species. Trophic levels are noted for each family on Table 1.

Three introduced species were collected including *Coccinella septempunctata* (L.), *Apis mellifera* L., and *Forficula auricularia* L. *Coccinella septempunctata* is an introduced Ladybug that has been very successful in North America, originally introduced to attack Russian Wheat Aphids. This species was the most commonly observed Ladybug in the field. It is possible that this species has or is in the process of displacing native species, with aphids being a limited resource. Since they overwinter in the foothills and are considered beneficials, it is unlikely that anything could be done to manage their populations. Secondly, the European earwig, *Forficula auricularia*, was attracted to the lights we used while collecting at Eagle Trailhead. They are a nuisance species, getting into homes and occasionally eating garden crops. Their scavenger/herbivores habit has helped them spread throughout North America. They are here to stay. The third non-native species is the European Honeybee, *Apis mellifera*. It was the most abundant bee seen in the field. At the Schneider site, one swarm was observed to have begun constructing a nest in a dense bush of *Rhus triloba* Nutt. Exposed honeybee colonies are

rare, and with the cold temperatures here, there is no chance that this colony will survive the winter. The construction of a hive in such an exposed area suggests that there are not enough cavities for all the colonies present in the area. (That's ok). The abundance of honeybees and the lack of native bees is disturbing to me. There are abundant nesting sites for the native bees to nest (dead wood, pithy stems, bare soil), so it appears that the low numbers of native species is more likely do to competition with the honeybees for pollen and nectar. The native species appear to be loosing out.

Conclusions

Based on the small numbers of specimens collected, the insect fauna in the area appears diverse. The presence of many parasitoids is proof that their insect hosts are flourishing.

A complete survey of the insects, is probably not feasible. From a practical standpoint thousands of specimens would need to be collected and identified. That would take thousands of hours of manpower as well as the cooperation of specialists throughout the world. However, small-scale collecting such as that done during the summer of 1995 documents some of the current insect fauna, and gives some evidence of the state of the insect fauna in the area. I would like to see the continuation of general collecting. In looking back through the past century of Boulder County insect collecting, the bulk of collecting began in the 1910's and continued through the 1940's. There is then a ten year gap, with another big push of collecting in the 1960's through 1970's. Collecting tapered off in the 1980's with little done since then. Seeing as that we have great information, historically, I hate to see another non-collecting period repeated. Without specimens we will have no basis for determining the health of or changes in the insect fauna over time.

Unlike collecting vertebrates, collecting insects has essentially no impact on their populations, except through the disturbance of their habitat. Careful, low-impact collecting of insect specimens should not be detrimental to the ecosystem.

Recommendations

1. Limit honeybee rearing on Open Space property. Honeybees are going to occur here (unless the varroa and/or tracheal mites spread to our area), but there is no point in encouraging them. They simply reduce the diversity of native bee species in the area by out competing them for pollen and nectar resources.
2. As I am sure you already do, when introducing an exotic species as a means of biological control for either plants or insects, use caution.
3. Limit use of pesticides. Bees of all species are very susceptible to insecticides. Since many plant species depend on them for pollination, limited use is recommended.
4. Continued collecting by CU staff and supervised EPO Biology classes will provide specimens for an historical record of the present insect fauna.
5. Upgrading the Boulder County Entomological Database would provide basic information on what insect species occur in the area, and with which species they are associated. It would provide a great foundation for future studies, and an historical perspective that is currently unavailable.

References used

Arnett Jr., R. H. 1985. American Insects: a handbook of the insects of America north of Mexico. Van Nostrand Reinhold. New York. 850pp.

Borror D. J., C. A. Triplehorn and N. F. Johnson. 1989. An introduction to the study of Insects, sixth edition. Harcourt Brace College Publishers. New York. 875pp.

Goulet, H. and J. T. Huber Eds. 1993. Hymenoptera of the world: an identification guide to families. Agriculture Canada. Ottawa, Ontario, Canada. 668pp.

Michener, C. D., R. J. McGinley and B. N. Danforth. 1994. The bee genera of north and central America. Smithsonian Institution Press. Washington D.C. 209pp.

Common name	Food source		Order	Family or group	Schneider Open Space			Eagle Trailhead
	immature	adult			06 June 1995	21 June 1995	28 July 1995	15 Sept. 1995
Soldier Beetle	pred	herb	Coleoptera	Cantharidae				2
Ground Beetle	pred	pred	Coleoptera	Carabidae				2
Long-horned Beetle	herb	herb	Coleoptera	Cerambycidae		5	1	
Leaf Beetle	herb	herb	Coleoptera	Chrysomelidae	3	1	10	4
Checkered Beetle	pred	pred/herb	Coleoptera	Cleridae			1	
Ladybug	pred	pred	Coleoptera	Coccinellidae	4	3	5	1
Weevil	herb	herb	Coleoptera	Curculionidae	6		9	2
Water scavenger Beetle	pred	scav	Coleoptera	Hydrophilidae				1
Lizard Beetle	herb	herb	Coleoptera	Languriidae			1	
Blister Beetle	para/herb	herb	Coleoptera	Meloidae	4	3		1
Tumbling flower Beetle	herb/pred	herb	Coleoptera	Mordellidae	1		2	
Beetle			Coleoptera	Unidentified	21		2	1
European Earwig	herb	herb	Dermaptera	Forficulidae				3
Anthomyiid Fly	herb		Diptera	Anthomyiidae		1		
Bee Fly	para/pred	herb	Diptera	Bombyliidae		4	1	
Blow Fly	scav	scav	Diptera	Calliphoridae				1
Midge	herb/scav		Diptera	Chironomidae	2			2
Mosquito	herb/scav	para/herb	Diptera	Culicidae				1
Long-horned Fly			Diptera	Nematocera				4
Soldier Fly	herb/pred	herb	Diptera	Stratiomyidae			1	
Tachinid Fly	para		Diptera	Tachinidae		1		1
Crane Fly	pred/scav	herb	Diptera	Tipulidae				2
Fly			Diptera	Unidentified	42		4	
Broad-headed Bug	herb	herb	Hemiptera	Alydidae				1
Water boatman	herb/pred		Hemiptera	Corixidae				1
Seed Bug	herb/pred	herb/pred	Hemiptera	Lygaeidae	23			1
Plant Bug	herb	herb	Hemiptera	Miridae	5	2	1	1
Damsel Bug	pred	pred	Hemiptera	Nabidae				1
Stink Bug	herb/pred	herb/pred	Hemiptera	Pentatomidae	1	1	3	6
Shield-backed Bug	herb	herb	Hemiptera	Scutelleridae			1	
Lace Bug	herb	herb	Hemiptera	Tingidae			1	
True Bug			Hemiptera	Unidentified	13			
Aphid	herb	herb	Homoptera	Aphididae	6			
Spittlebug	herb	herb	Homoptera	Cercopidae	4	1	3	
Leafhopper	herb	herb	Homoptera	Cicadellidae	12		13	
Cicada	herb	herb	Homoptera	Cicadidae			4	
Fulgorid	herb	herb	Homoptera	Fulgoroidea			2	

Table 1. 1995 Collecting Report: City of Boulder Open Space Property

Treehopper	herb	herb	Homoptera	Membracidae		1		9	
Hopper			Homoptera	Unidentified		4			
Andrenid Bee	herb	herb	Hymenoptera	Andrenidae				1	
Honey/Bumblebee	herb/para	herb	Hymenoptera	Apidae			5	2	2
"Death" Wasp	para	herb	Hymenoptera	Braconidae				3	
Chalcid Wasp	para	herb	Hymenoptera	Chalcidoidea		6			
Ant	herb/pred	herb	Hymenoptera	Formicidae		4		6	2
Sweat Bee	herb/para	herb	Hymenoptera	Halictidae		3	8	7	
Ichneumon Wasp	para	herb	Hymenoptera	Ichneumonidae		2		2	1
Leafcutting Bee	herb/para	herb	Hymenoptera	Megachilidae				1	
Spider Wasp	pred	herb	Hymenoptera	Pompilidae				1	
Pteromalid Wasp	para	herb	Hymenoptera	Pteromalidae			1	3	
Sphecid Wasp	pred	herb	Hymenoptera	Sphecidae			1		
Sawfly	herb	herb	Hymenoptera	Symphyta		2			
Yellowjacket etc.	pred	herb	Hymenoptera	Vespidae			2	2	
Wasp			Hymenoptera	Unidentified		1			
Skipper	herb	herb	Lepidoptera	Hesperiidae					
Blue, Copper Butterfly	herb	herb	Lepidoptera	Lycaenidae			4		
Noctuid Moth	herb	herb	Lepidoptera	Noctuidae					5
Brush-footed Butterfly	herb	herb	Lepidoptera	Nymphalidae		1	6		2
Swallowtail Butterfly	herb	herb	Lepidoptera	Papilionidae					
White, Sulfer Butterfly	herb	herb	Lepidoptera	Pieridae			1		
Plume Moth	herb	herb	Lepidoptera	Pterophoridae		1			1
Satyr Butterfly	herb	herb	Lepidoptera	Satyridae			2		
Moth	herb	herb	Lepidoptera	Unidentified					2
Green Lacewing	pred	pred/herb	Neuroptera	Chrysopidae				1	
Antlion	pred		Neuroptera	Myrmeleonidae				1	
Dragonfly	pred	pred	Odonata	Anisoptera				2	
Damselfly	pred	pred	Odonata	Zygoptera			6		
Short-horned Grasshopper	herb	herb	Orthoptera	Acrididae					4
Cricket	herb	herb	Orthoptera	Gryllidae					1
Mantid	pred	pred	Orthoptera	Mantidae					4
Caddisfly	herb/pred		Trichoptera	Unidentified					3
				total by date		172	58	106	66
				total by site				336	66
				grand total					402

Table 1. 1995 Collecting Report: City of Boulder Open Space Property