INSECTS OF CRATERS OF THE MOON NATIONAL MONUMENT, IDAHO

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DONALD SHERWOOD HORNING, JR.

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This thesis of Donald Sherwood Horning, Jr. for the Master of Science degree, "Insects of Craters of the Moon National Monument, Idaho,"

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C. has been granted final acceptance after review by the Graduate Council and after successful completion of the final oral examination:

Dean of the

Graduate School_____ Date_____

BIOGRAPHICAL SKETCH OF THE AUTHOR

Donald Sherwood Horning, Jr. was born in Portland, Oregon, 12 March 1937. He attended Lincoln High School, Portland, Oregon, and Columbia High School, Richland, Washington, and graduated from the latter in June, 1955. In September, 1955 he enrolled at the University of Idaho, Moscow, Idaho. His education was interrupted when he was drafted into the United States Army in January, 1960. He returned to the University of Idaho in September, 1962 and received a Bachelor of Science degree in Forestry with a major in Fisheries Management in June, 1963. He then entered the University of Idaho Graduate School in September, 1963 and in June, 1966 completed his requirements for the Master of Science degree, of which this thesis is a part.

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ABSTRACT

This study consisted of an inventory of the insect species inhabitating Craters of the Moon National Monument, Idaho, with special attention given to the associations of insects and plants and the relating of insects with particular lava and non-lava habitats. The period of study included the summers of 1964 and 1965, with the majority of field work conducted in 1965.

The largest number of insect species was collected from a non-volcanic area. Lava habitats varied in number of insect species. Old, decomposed cinder cones supported the greatest number of insect species. The decomposed aa and pahoehoe lava flows were less favorable to insect activity than the cinder cones. Undecomposed pahoehoe lava flows and bare cinder areas did not have an abundance of plant life, and the insect populations were markedly lower. The least favorable habitat to insects in the Monument was the undecomposed aa lava flows.

Several plant species growing on lava were found to be particularly attractive to insects. These include Chamaebatiaria millefolium (Torrey) Maximowicz, Chrysothamnus nauseosus (Pallas) Britton, Phacelia leucophylla Torrey, and Pinus flexilis James. Only a few plant species were considered to be of little significance to insect life.

During this study, 20 orders, 225 families, 1054 genera and 1844 species and subspecies were found from Craters of the Moon National Monument. More than 30 of the species are new to science. Also included in the list of species are many new state records and several new United States records.

The order Hymenoptera was best represented with 315 genera, 676 species, and 4054 collected specimens. Diptera ranked next in number with 243 genera, 425 species, and 1566 collected specimens. Coleoptera was third in number with 201 genera, 325 species, and 2192 collected specimens.

INSECTS OF CRATERS OF THE MOON NATIONAL MONUMENT, IDAHO

BY

DONALD SHERWOOD HORNING, JR.

INTRODUCTION

Craters of the Moon National Monument located in south central Idaho contains one of the more recent volcanic areas in the United States, excluding Alaska and Hawaii. Because of the unique volcanic landscape, this National Monument was established by Presidential Proclamation in 1924.

Craters of the Moon is located on a fissure, known as the Great Rift, and was subjected to at least three eruption periods ranging from approximately 1,000,000 to 1,600 years ago (Fig. 1). The Monument covers about 83 square miles of the more interesting and recent part of a large basaltic lava flow that covered hundreds of square miles of the northeast corner of the Snake River Plains.

The geology of the area has been studied extensively by Sterns (1926) and Murtaugh (1961). Their research established a general sequence of flow activity and includes specific descriptions of the different lava formations.

A limited amount of work has been conducted on the flora of this Monument. Senior (1940) published a brief, popular account of the area and listed a few of the plants that occur. The major botanical work was conducted by Eggler (1941). He studied the vegetation and primary plant

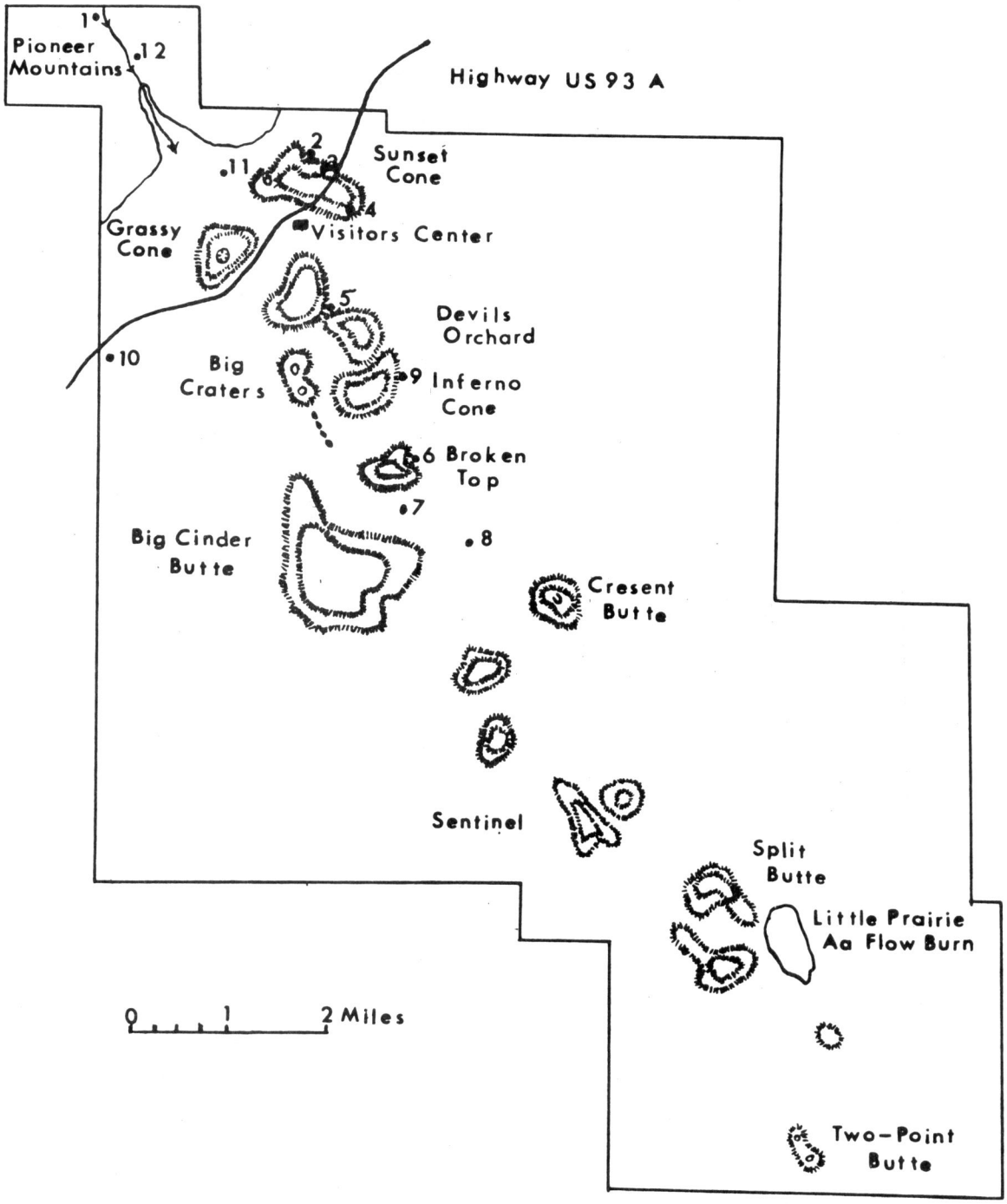


Fig. 1. Craters of the Moon National Monument, Idaho. Numbers mark the sites of the collecting stations.

succession on lava and on cinder cones in the Monument and adjacent areas. He recognized four distinct vegetation habitats on young lava flows with a ropy or smooth surface: (1) The xeric, bare flow surface supports the pioneer plants of lichen; (2) The joint habitat is characterized by plants growing with their stems fully exposed and with their roots penetrating narrow joints in the rock; (3) Shallow crevices, with a thin soil deposit, furnish a habitat for smaller plant species; (4) Deep crevices that provide the most moisture support several mesic herb and shrub species as pioneers. Soil eventually fills the crevices and is deposited as a mantle over the lava flow surface. He concluded that deep crevice plants first would be eliminated because of the changing habitat, then shallow crevice plants, and finally joint and rock surface plants. He felt they are all replaced by a grass-sage community which may be climax for the area.

Little research has been conducted on the fauna at Craters of the Moon. Park personnel have composed several unpublished checklists of birds, mammals, and reptiles, but they are not generally available to the public. Scattered literature records indicate a small amount of insect collecting has previously taken place (Harris and Shull, 1944; MacNeil, 1964; Richards, 1963; Stephen, 1957).

The present study, conducted during the summers of 1964 and 1965, constitutes the first comprehensive investigation of the Insecta at Craters of the Moon National

Monument. It was designed primarily as an inventory of the insects within the boundaries of the Monument. Efforts were made to associate insects with particular lava environments and plant associations. Generally, other Arthropoda were collected only when they appeared to have a relationship with insects.

The identification of insects was made by the author and the taxonomic specialists listed in the acknowledgments. Some groups of insects are not yet identified and include Cicadellidae, Chrysopidae, Diptera, and Microlepidoptera. As a consequence, a complete listing of all insect species collected is not possible.

STUDY AREA

The area receives scanty precipitation and has fairly low winter temperatures and moderately hot summers. The total precipitation in 1964 was 21.2 inches, with 158.3 total inches of snow. The total precipitation in 1965 was 15.8 inches, with 98.4 total inches of snow. The ten year average is 17.1 inches of total precipitation, with 90.3 total inches of snow. The precipitation rate in 1964 was higher with more snow than the previous ten year average. The recorded temperature extremes during the two year study period were -17° F. in December, 1964 and 93° F. in July, 1964. The 1964-1965 mean maximum for July (the hottest month) was 83.2° F., compared with the ten year average of 85.3° F.

The 1964-1965 mean minimum for February (the coldest month) was 7.3° F. compared to the ten year average of 6.8° F. for January which is generally the coldest month. The year 1964 had a colder winter and a slightly warmer summer than in 1965. The temperatures for 1964-1965 did not vary much from the previous ten year average. All the above records were obtained from the weather data files at Craters of the Moon National Monument. The summer days were quite warm and the nights cool, with cloudless nights.

Prevailing southwesterly winds usually would commence in mid-morning and be at full force by early afternoon. By late afternoon, the winds abated and calm conditions were usually evident by sundown. Night winds were rare. Wind velocity was not measured during this study, however, Eggler (1941) estimated it to reach 15 to 20 miles per hour in unprotected areas and rarely 32 to 38 miles per hour (Beaufort scale).

For the purposes of this study, only three basic lava types were considered: (1) Aa lava is a flow with a rough, clinkery surface; (2) Pahoehoe lava has a smooth or ropy surface; (3) cinder cones are mounds built up by small ejecta around a vent with most of the particles being no larger than one-half inch in diameter, and mostly loose. A cinder cone may rise several hundred feet above the surrounding plateau.

This entomological inventory was conducted not only in the lava areas but also included a superficial survey of

Little Cottonwood Creek Canyon in the northern portion of the Monument. This area is in the lower part of the Pioneer Mountains and is not of volcanic origin.

DESCRIPTIONS OF COLLECTING SITES

Approximately seven square miles of the Monument was under study due to the inaccessibility of the remaining area. It is believed by the author that this small area contained a good representation of the lava formations, plant cover, and insect life in the entire Monument. Several collecting stations were established in the study area. They are described in some detail below to illustrate the topography and plant species at each site.

Collecting station 1 was located on a treeless, south slope near the northern boundary of the Monument near the top of Little Cottonwood Creek Canyon at an elevation of 7000 feet. The soil is of a granitic origin, with no evidence of lava activity, and supports a dense cover of Heracleum lanatum Michaux, Rudbeckia occidentalis Nuttall, Salix spp., Senecio serra Hooker, Urtica lyalli Watson, and various tall grasses. Only casual collecting was carried on here.

Collecting station 2 was located at an elevation of 6000 feet on the northeast slope of Sunset Cone which consists primarily of decomposed cinder mixed with small areas of broken lava. Pseudotsuga menziesii variety glauca (Beissner) Franco with a small scattering of Pinus flexilis James,

Populus tremuloides Michaux, and Salix spp. are dominant. The principal shrubs are Artemisia tridentata Nuttall, Purshia tridentata (Pursh) de Candolle, and Ribes cereum Douglas, with scattered plants of Chamaebatiaria millefolium (Torrey). Herbs include Chaenactis douglasii (Hooker) Hooker and Arnott, Eriogonum ovalifolium Nuttall, Eriogonum umbellatum Torrey, Lupinus spp., and Potentilla spp. At the bottom of the slope is a small, treeless flat with Chrysothamnus nauseosus (Pallas) as the principal shrub species. There are many herbs, including those occurring further up the slope, and a large stand of grass, Elymus condensatus Presl. Despite the sheltering effect of a portion of Sunset Cone to the west, wind velocities occasionally were high in this area, as evidenced by the small pieces of cinder imbedded in the grass stems. There was a remarkable difference in insect activity at this station between 1964 and 1965. In early June, 1965, a small corral was built to keep horses. A continuous stream of running water was piped to the corral and the overflow from the watering trough proved to be an excellent attractant to many insect species that had not been previously seen or collected at this station.

Collecting station 3 was on a treeless, open area on the east slope of Sunset Cone about 100 yards west of the Little Cottonwood Creek access road at an elevation of 5950 feet. The soil is a combination of aeolian soil and decomposed cinder. The principal shrubs include A. tridentata

C. nauseosus, and P. tridentata. The principal herbs of insect importance include Balsamorhiza sagittata (Pursh) Nuttall, E. ovalifolium, E. umbellatum, Lithospermum ruderale Lehmann, Phlox spp., and Pteryxia terebinthina (Hooker) Coulter and Rose. Scattered clumps of E. condensatus also are present.

Collecting station 4 was placed on an open area on the southeast extension of Sunset Cone, approximately 300 yards west of the permanently established disposal area. It was located at the summit of a south facing small knoll and was subjected to high wind velocities from the southwest. The soil is much the same as at station 3. The usual shrubs associated with the older cinder cones are present. This station is much the same as station 3 except B. sagittata does not occur here and there are heavy stands of E. condensatus with scatterings of Oryzopsis hymenoides (Roemer and Schultes) Ricker. A constantly dripping faucet was located just south of this station and provided a good attractant for flying insects.

Collecting station 5 was located on the east side of North Crater cinder cone at an elevation of 5900 feet. It was set in a small isolated patch of P, tridentata and herbs, including C. douglasii and Phacelia leucophylla Torrey (Fig. 2). A bare cinder slope much the same as described at station 8 surrounds this island of vegetation.



Fig. 2. Island of vegetation at right is location of station 5, on the east slope of North Crater (USNPS).

Collecting station 6 was placed on the east slope of Broken Top cinder cone, just west of the fire access road at an elevation of 6000 feet. This slope is covered with P. flexilis with a small patch of Juniperus scopulorum Sargent. Many dead P. flexilis are near the upper limits of this station. Shrubs such as C. nauseosus, P. tridentata, and Ribes cereum Douglas are the dominant species. Among

the principal herbs are C. acuminatum, G, nuttalli, Lupinus caudatus Kellogg, P. leucophylla, and P. terebinthina. A few clumps of E. condensatus are present in the more open areas.

Collecting station 7 was located on a large, bulbous pahoehoe lava flow, at an elevation of 5800 feet. Three general habitats are present: (1) Bare rock surfaces; (2) small crevices and pockets in the lava flows; (3) Deep cracks in the lava (Fig. 3). This part of the lava flow is flat and is subjected to the highest wind velocities encountered at any of the other collecting stations. There are no trees and only a few shrub species, principally Appoppus sp., C. millefolium, Holodiscus discolor (Pursh) Maximowicz, and Philadelphus lewisii Pursh. Herbs include C. douglasii, Erigeron spp., various species of Eriogonum, P. leucophylla, and Potentilla spp.

Collecting station 8 was located at the north end of Trench Mortar Flat south of the fire access road at an elevation of 5775 feet. It is a large cinder flat partially surrounded by a shrub-herb community (Fig. 4). The area is exposed to high wind velocities from the west and although the cinder is light in weight, it is fairly stable and does not form dunes. Many plants are present including C. douglasii, Eriogonum depressum Blankinship, Gayophytum ramosissimum Torrey and Gray, Lewisia rediviva Pursh, and Mimulus nanus Hooker and Arnott as well as scattered plants of

E. umbellatum throughout the area with patches of Bromus tectorum Linnaeus and Lupinus sp. on the edges of the bare cinder flat. The shrub, C. nauseosus, is invading the area from the surrounding heavily vegetated community.



Fig. 3. Ropy pahoehoe lava like that present at station 7. Small herbs can be seen in the cracks in the lava (USNPS).

Collecting station 9 was on the east slope of Inferno Cone west of the Loop Drive Road at an elevation of 5850 feet. This cone is old and is covered with a dense stand of trees and shrubs. The soil consists mainly of decomposed

cinder and provides a good base for plant growth. Wind velocities at this station are not too great, as it is protected somewhat by Inferno Cone. The dominant plants

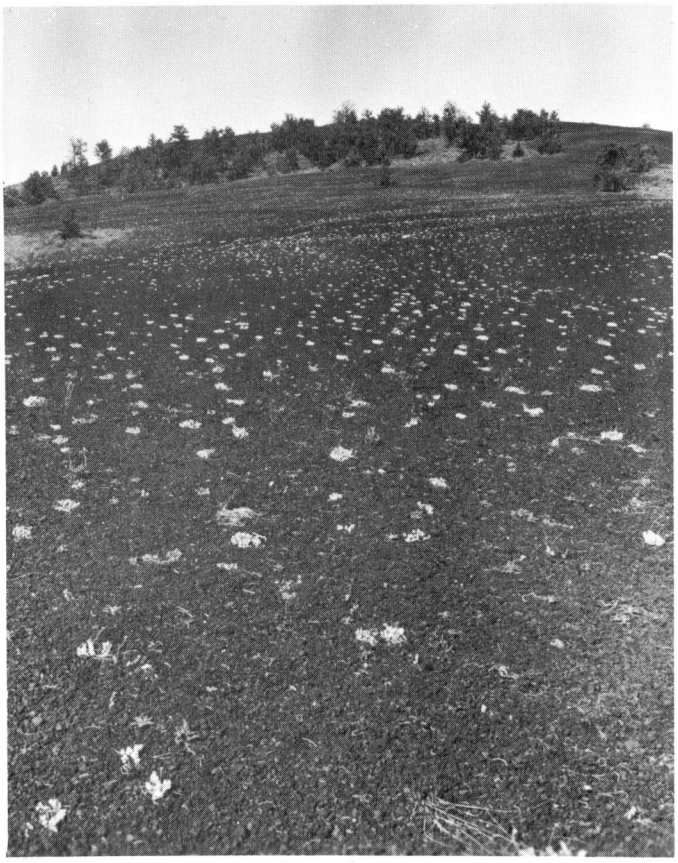


Fig. 4. A typical cinder slope. The white plants are Eriogonum depressum Blankinship (USNPS).

consist of a mature stand of P. flexilis and P. tridentata. A dense mixture of shrubs consisting of Artemisia tridentata

Nuttall, with scattered plants of C. millefolium, C. nauseosus, and R. cereum, are evident. Herbs of insect importance include C. douglasii, L. caudatus, and P. leucophylla with M. nanus growing in open areas.

Collecting station 10 was on the west boundary of the Monument, approximately 400 yards south of U. S. Highway 93 A, at an elevation of 5750 feet. It was placed in a mixture of aa and pahoehoe lava (Fig. 5). There are no trees, but shrubs, such as C. millefolium and P. lewisii, predominate. They have become established in the deep cracks



Fig. 5. Lava formations typical of station 10 (USNPS)

in the lava where there is a source of water. There are scattered plants of Allium sp., Eriogonum umbellatum Torrey, Opuntia polyacantha Haworth, and Opuntia rhodantha Schumann in the shallower cracks.

Collecting station 11 was on a treeless, exposed, decomposed aa flow that issued from a parasitic cone on the northwest side of Sunset Cone, elevation 5950 feet (Fig. 6). It is a mixture of decomposed aa rising above adjacent loess and decomposing cinder soil. Wind velocities are not too great because of the protection of a much higher flow to the west. Vegetation was noticeably different on the aa and the adjacent area. On the decomposed aa flow, such herbs as Allium sp., Calochortus sp., E. ovalifolium, E. umbellatum, Mentzelia laevicaulis (Douglas) Torrey and Gray, O. polyacantha, O. rhodantha, P. leucophylla, Phlox sp., and Potentilla sp. are abundant. There is a scattered shrub cover consisting primarily of A. tridentata and P. tridentata. In the loess and decomposing soil area, such shrubs as A. tridentata, C. millefolium, C. nauseosus, Chrysothamnus viscidiflorus (Hooker) Nuttall, and P. tridentata are common. The herbs that are on the decomposed aa lava are present in this area, except for the two species of Opuntia. The Malaise trap was set in a meadow grass clearing just west of this station.

Collecting station 12 was located on a flat clearing near the entrance to a deserted mine in Little Cottonwood

Creek Canyon at an elevation of 6300 feet. It is totally different than the lava formations to the south and is basically the same as station 1. The creek had been dammed by beaver and the majority of collected aquatic insects came from this beaver pond. There are many plant species but only



Fig. 6. Decomposed aa lava flow northwest of Sunset Cone. Station 11 was located in an area on the lower right of the photograph. The Pioneer Mountains are in the background (USNPS).

a few were checked continually for insect activity. The principal tree species are Alnus tenuifolia Nuttall, Populus tremuloides Michaux, and Populus trichocarpa

Torrey and Gray, with a scattering of Salix spp. A few shrubs, such as A. tridentata and C. nauseosus grow in the more open areas. There is a heavy stand of mixed vegetation along the creek, including Agastache urticifolia (kuntze) Rydberg, H. lanatum, Prunus virginiana Linnaeus, Rubus parviflorus Nuttall, S. serra, U. lyalli, and Xanthium sp. It is believed that one half of all plant species growing in the Monument can be found here.

In addition to the established collecting stations, other sites also were visited.

Big Craters is a large multi-crater composite cinder cone that issued both aa and pahoehoe lava flows. Collections were made periodically on the southwest slope at an elevation of 6000 to 6300 feet. Collecting efforts were concentrated only on the dead trees in a stand of P. flexilis, having an understory of such herbs as C. douglasii, M. nanus, P. leucophylla, and various species of Eriogonum.

Devils Orchard is an easily accessible and unique composite area at an elevation of 5800 feet. It has several kinds of lava formations (Fig. 7) and the majority of the plant species adapted to the lava environment are present. Unfortunately the number of insect collections made at this site were limited because of large visitor concentrations.

General area designation is used extensively in the following text to indicate general collecting sites not

assigned a collecting station number, or those that could not be related to a landmark.

Grassy Cone is similar to Sunset Cone in age and vegetation and supports a shrub-grass-herb community similar to that at station 3, except for the northeast slope which has a dense stand of P. menziesii variety glauca with a



Fig. 7. General features at the edge of an aa lava flow with cinder in the foreground. This is typical of the Devils Orchard (USNPS).

scattering of P. flexilis similar to station 2.

Little Prairie Aa Flow Burn was caused by

lightning in August, 1964. It burned approximately 300 acres of vegetation on aa and broken pahoehoe lava. The burn is located in the southeast area of the Monument and is confined to a shrub and herb community at the east edge of a large P. flexilis stand. Because of the unique conditions, several collections were made immediately following the fire in 1964.

Visitor Center and Residential area collections were made frequently, especially on the shrubs Cornus sericea form stolonifera (Michaux) Fosberg and Rosa woodsi Lindley. Additional collections were made on lawn grass and clover, Trifolium repens Linnaeus. Many insects were captured in the Visitors Center on the large south-facing windows. In 1964, all blacklighting was done near the residential area.

METHODS

Many standard entomological collecting techniques were utilized, including the use of beating and sweeping nets, lights, traps, Berlese funnel, and rearing of immature insects from their hosts. Two special traps, the Malaise trap and the stick traps, were very successful.

The Malaise trap (Marston, 1965) was the most efficient collecting technique utilized. It was moved from a station after maximum floral activity at that station was completed (approximately one week). It could not be set up at stations 7 and 10, due to the lack of secure anchorage in the lava.

High wind velocities destroyed the trap before it could be set up at stations 1 and 6.

Stick traps, consisting of 15 inch long, small diameter, sticks with a hole drilled in one end and another in the side, were set out at various collecting sites at the beginning of the summer to attract nesting Hymenoptera and their parasitoids. All traps were placed vertically in the ground, with the drilled tops exposed and available to the nesting Hymenoptera.

PROCEDURES USED IN COMPOSING LIST OF INSECTS

The arrangement and use of ordinal names follow Borror and DeLong (1964) except for the Raphidoidea. The placement of families and genera follow recent catalogs, revisions, checklists, and taxonomic specialists as indicated. All species are listed alphabetically for convenience. The collection data are written in a telegraphic style. Station numbers and other collecting areas follow the insect name, with the inclusive collecting dates shown next. Host plant species are shown after the dates in an abbreviated style to conserve space, followed by the method of collection. Any available biological information also is appended.

PLANTS FROM WHICH INSECTS WERE COLLECTED

Collecting efforts were concentrated on the plant species as tabulated below. These species represent the majority of plants of known importance to insect life at Craters of the Moon National Monument. The abbreviations used comprise the first two letters of the genus and species, respectively. Thus, Artr represents Artemisia tridentata. If there are two or more plant species with the same abbreviation, then all but the first will be followed by a number, e.g., Potr for Populus tremuloides, Potr 2 for Populus trichocarpa. If there are no identified species within a genus, then the first four letters of the generic name are used and are placed in upper case letters, e.g., SALI for Salix species. The below plant species names and those mentioned in the text follow Davis (1952) when applicable.

Agur = Agastache urticifolia (Kuntze) Rydberg

Alte = Alnus tenuifolia Nuttall

Amal = Amelanchier alnifolia Nuttall

Arca = Arceuthobium campylopodum Engelmann

Artr = Artemisia tridentata Nuttall

Asca = Aster canascens Pursh

Basa = Balsamorhiza sagittata (Pursh) Nuttall

CALO = Calochortus sp.

Chdo = Chaenactis douglasii (Hooker) Hooker and Arnott

CHEN = Chenopodium sp.

Chmi = Chamaebatiaria millefolium (Torrey) Maximowicz

Chna = Chrysothamnus nauseosus (Pallas) Britton

Chvi = Chrysothamnus viscidiflorus (Hooker) Nuttall

Cica = Cirsium canescens Nuttall

Civu = Cirsium vulgare (Savi) Airy-Shaw

Cost = Cornus sericea form stolonifera (Michaux) Fosberg

Crac = Crepis acuminatum Nuttall

DELP = Delphinum spp.

Elco = Elymus condensatus Presl

ERIO = Eriogonum spp.

Erde = Eriogonum depressum Blankinship

Erla = Eriophyllum lanatum (Pursh) Forbes

Erov = Eriogonum ovalifolium Nuttall

Erum = Eriogonum umbellatum Torrey

Ganu = Gayophytum nuttalli Torrey and Gray

Gara = Gayophytum ramosissimum Torrey and Gray

Gene = Geranium nervosum Rydberg

Hean = Helianthus annuus Linnaeus

Hela = Heracleum lanatum Michaux

Hodi = Holodiscus discolor (Pursh) Maximowicz

Jusc = Juniperus scopulorum Sargent

Lere = Lewisa rediviva Pursh

Liru = Lithospermum ruderale Lehmann

Luca = Lupinus caudatus Kellogg

LUPI = Lupinus spp.

Mela = Mentzelia laevicaulis (Douglas) Torrey and Gray

Meof = Melilotus officinalis (Linnaeus) Lamarck

MERT = Mertensia sp.

Mina = Mimulus nanus Hooker and Arnott

Oppo = Opuntia polyacantha Haworth

Oprh = Opuntia rhodantha Schumann

Pede = Penstemon deustus Douglas

Phle = Phacelia leucophylla Torrey

Phle 2 = Philadelphus lewisii Pursh

Pifl = Pinus flexilis James

Pops = Potentilla glandulosa pseudorupestris Rydberg

POTE = Potentilla species

Potr = Populus tremuloides Michaux

Potr 2 = Populus trichocarpa Torrey and Gray

Prvi = Prunus virginiana Linnaeus

Psgl = Pseudotsuga menziesii variety glauca (Beissner) Franco

Ptte = Pteryxia terebinthina (Hooker) Coulter and Rose

Putr = Purshia tridentata (Pursh) de Candolle

Ranu = Ranunculus spp.

Rice = Ribes cereum Douglas

Rowo = Rosa woodsi Lindley

Ruoc = Rudbeckia occidentalis Nuttall

RUME = Rumex sp.

Rupa = Rubus parviflorus Nuttall

SALI = Salix spp.

Seca = Senecio canus Hooker

Sese = Senecio serra Hooker

Syva = Symphoricarpos vaccinioides Rydberg

Taof = Taraxacum officinale Weber

Tavu = Tanacetum vulgare Linnaeus

Trre = Trifolium repens Linnaeus

Urly = Urtica lyalli Watson

Veth = Verbascum thapsus Linnaeus

Wyam = Wyethia amplexicaulis Nuttall

XANT = Xanthium sp.

ZYGY = Zygydenus sp.

ANNOTATED LIST OF INSECTS COLLECTED

ORDER THYSANURA

SUBORDER ECTOGNATHA

Family Lepismatidae

Mesomachilis nearcticus Silvestri

Station 6 and general area; 14 June to 31 July; on foliage of Pifl, in fly trap, on cinder, in rotten log.

ORDER THYSANURA

SUBORDER ENTOGNATHA

Family Campodeidae

Genus ? species ?

Station 6; 17 September; Berlese plants of Ptte.

ORDER COLLEMBOLA

Arrangement of this order follows the list of Wray and Knowlton (1956) and was reviewed by R. F. Wilkey.

SUBORDER ARTHROPLEONA

Family Poduridae

Xenylla humicola Tullberg

Station 6; 17 September; Berlese plants of Ptte.

This species was very abundant at the base of plants of Ptte.

Onychiurus pseudofimetarius Folsom

Station 12; 22 November; in duff.

Several active specimens were observed in duff under a stand of Potr in below freezing weather.

Family Isotomidae

Isotoma trispinata ? (MacGillivray)

Station 12; 22 November; in duff.

Several active specimens were observed in duff under a stand of Potr and Potr 2 in below freezing weather.

Family Entomobryidae

Entomobrya species

Station 2; 12 September; Berlese duff of Psgl.

Family Tomoceridae

Tomocerus (Pogonognathellus) flavescens (Tullberg)

Station 12; 22 November; under rocks.

Several active specimens were seen under rocks in duff under a stand of Potr in below freezing weather.

SUBORDER SYMPHYPLEONA

Family Sminthuridae

Sminthurus species

Station 6; 17 September; Berlese plants of Ptte.

ORDER EPHEMEROPTERA

Arrangement for this order follows the checklist of Edmunds and Allen (1957).

Family Siphlonuridae

Ameletus velox ? Dodds

Station 12; 23 November; nymphs on 5-10 cm rocks in water at edge of stream.

Family Heptageniidae

Cinygma integrum Eaton

Station 12; 23 November; nymphs on 5-10 cm rocks in water at edge of stream.

Family Baetidae

Baetis species

Station 12; 20 June; sweeping streamside vegetation.

Family Caenidae

Caenis simulans McDunnough

Station 6; 14 August; attracted to black light trap.

ORDER ODONATA

SUBORDER ANISOPTERA

Arrangement of this suborder follows Needham and Westfall (1955).

Family Aeshnidae

Aeshna interrupta interna Walker

Visitors Center and Residential area; 31 July to 28 August; in flight.

Aeshna palmata Hagen

Devils Orchard; 2 August; in flight.

Family Libellulidae

Sympetrum danae (Sulzer)

Station 6; 1 August to 27 August; in flight.

Sympetrum obtrusum (Hagen)

Stations 2 and 6; 8 July to 27 August; on branches of Artr and Chvi.

Specimens of this slow flying species were captured while resting on the tips of dead branches of Artr at station 6. The author believes there must be

undiscovered standing water to the east of this station in the broken pahoehoe lava flows because the majority of specimens collected were in a teneral condition.

SUBORDER ZYGOPTERA

The placement of names in this suborder follows Walker (1953).

Family Lestidae

Lestes congener Hagen

Stations 2 and 6; 17 July to 27 August; trunk bark of *Pifl*, Malaise trap, in flight.

This species was most abundant at station 6, suggesting a nearby water source.

Lestes unguiculatus Hagen

Station 6; 30 June to 20 July; on dead branches of *Artr*, in flight.

This species seemed to prefer dead branches of *Artr* on which to rest. All specimens observed landed on stems with the heads up and bodies parallel to the branches.

Family Coenagrionidae

Amphiagrion abbreviatum (Selys)

Station 2; 10 July to 24 August; sweeping *Artr*, shrubs, in flight.

Many adults were observed at this station on the shrubs surrounding the horse pasture. Nymphs could not

be found in the steady stream of water that ran through the area.

Enallagma boreale Selys

Stations 2, 6, and 10; 30 June to 2 August; on foliage of Artr, Chmi, and Meof, in flight.

Ischnura cervula Selys

Station 2; 24 August; sweeping shrubs.

Ischnura perparva Selys

Stations 2 and 12; 14 July to 12 August; Malaise trap, on ground.

ORDER ORTHOPTERA

Family arrangement follows the monograph of Rehn and Grant (1961). All genera and species within the families are listed alphabetically.

SUBORDER CAELIFERA

Family Acrididae

Arphia pseudonietana pseudonietana (Thomas)

General area; 20 July to 27 August; on cinder.

Cirotettia undulatus (Thomas)

Station 3; 27 August; on cinder.

Cratypedes neglectus (Thomas)

General area; 12 July to 15 August; on cinder.

Dissosteira carolina (Linnaeus)

Station 12; 3 August to 5 September; on ground.

Melanoplus bivitattus (Say)

Station 4 and general area; 23 July to 10 August; on cinder.

The largest population of this species was in the area south and east of the permanent garbage dump. Several specimens also were collected at the site of the Little Prairie Aa Flow Burn (1964).

Melanoplus foedus Scudder

Station 6 and general area; 27 July to 24 August; on cinder.

Melanoplus occidentalis Thomas

Visitors Center area; 11 August; under rock.

One specimen was found dead under a 15 cm rock at the edge of the parking lot in back of the Visitors Center.

Melanoplus sanguinipes sanguinipes (Fabricius)

Stations 6, 12, and general area; 12 July to 22 November; on foliage of Chna, Chvi, on limb of dead Pifl, in duff of Potr, on cinder.

One live female was found under a 10 cm rock near the stream at station 12 on 22 November. Temperatures to this time probably had not been lower than 15° F. in this protected area.

Melanoplus packardii ? Scudder

Station 6; 10 August; sweeping shrub foliage.

Pseudopomala brachyptera (Scudder)

Station 4; 14 July; sweeping Elco.

Schistocercus shoshone (Thomas)

Station 7 and Little Prairie Aa Flow Burn (1964); 9 August to 10 August; on cinder and pahoehoe lava.

Trimerotropis arenacea Rehn

Stations 1, 6, 8, and general area; 27 July to 13 September; on foliage of Chna, on ground.

Trimerotropis cyaneipennis Brunner

Station 4 and general area; 13 July to 17 August; sweeping Chmi, on cinder.

Trimerotropis fontana Thomas

Stations 1, 4, and general area; 8 August to 5 September; on cinder, on ground.

Trimerotropis pallidipennis pallidipennis (Burmeister)

General area; 20 July to 10 September; on cinder.

Trimerotropis suffusa Scudder

Station 6 and general area; 17 July to 24 August; on cinder, in tin can trap.

Xanthippus corallipes buckelli Hebard

Stations 2, 7, and 11; 13 June to 10 July; on cinder.

Xanthippus corallipes montanus (Thomas)

Station 3; 20 June; on cinder.

Family Tettigonidae

Conocephalus fasciatus (DeGeer)

Station 2 and Visitors Center and Residential area; 9 August to 24 August; on foliage of Trre, sweeping shrub foliage.

Idiostatus magnificus ? Hebard

General area; 19 August; on branches of Pifl.

Steiroxys trilineatus ? (Thomas)

General area; 10 August; on ground.

Family Gryllacrididae

Ceuthophilus caudelli Hubbard

Visitors Center; 9 August; in dark corner of room.

Ceuthophilus species

Station 4 and Visitors Center; 27 June to 9 August; in room, under canvas.

Family Gryllidae

Oecanthus californicus Saussure

Stations 3, 6, and 12; 11 August to 27 August; Malaise trap, under rock.

Oecanthus quadripunctatus Beutenmuller

General area; 13 September; on foliage of Chna.

ORDER ISOPTERA

Family Rhinotermitidae

Reticulitermes hesperus Banks

Station 12; 25 June to 28 June; under rock.

The nest was under a 40 cm diameter rock, on the east slope of a hill, under the shade of a *Potr*.

ORDER PLECOPTERA

Arrangement for this order follows the systematic checklist of Gaufin (1964).

Family Nemouridae

Nemoura (*Zapada*) *oregonensis* Claussen

Station 1; 23 November; nymphs under 10 cm rock in water at edge of stream.

Nemoura (*Malenka*) species

Station 1 and 12; 20 June to 23 November; sweeping streamside vegetation, nymphs under 2-4 cm rocks in water in middle of stream.

Family Perlodidae

Isoperla species nova

Station 12; 1 August; sweeping streamside vegetation.

Family Chloroperlidae

Alloperla fidelis Banks

Station 12; 20 June to 15 July; sweeping streamside vegetation.

Family Perlididae

Acroneuria californica Banks

Station 12; 17 August; nymphs under 20 cm rock at stream edge.

ORDER DERMAPTERA

Family Forficulidae

Forficula auricularia Linnaeus

Campground area and Visitors Center; 17 July to 31 August; on ground, on floor.

It is believed this species is regularly brought into the Monument by park visitors as the cinder and rough lava environment may be unsuitable for its establishment.

ORDER PSOCOPTERA

SUBORDER TROCTOMORPHA

Family Liposcelidae

Liposcelis species near liparus Broadhead

General area; 14 April to September; under bark of Pifl.

Many specimens were reared from under the bark of dead Pifl that was collected in early Spring.

SUBORDER EUPSOCIDA

Family Psocidae

Blaste species

Station 6; 17 July; in flight.

Psocus conspersus Banks

General area; Summer; taken from Pifl rearings.

ORDER THYSANOPTERA

Watson's (1923) and Cott's (1956) papers were followed in placing the families and genera of this order in a sequence which was reviewed By Dr. Stanley F. Bailey.

SUBORDER TEREBRANTIA

Family Aeolothripidae

Aeolothrips auricestus Treherne

Station 2; 12 July; on plant foliage.

Aeolothrips fasciatus (Linnaeus)

Visitors Center area; 13 August; sweeping Meof.

Family Thripidae

Hercothrips fasciatus (Pergande)

Station 2; 17 September; Berlese duff of Psgl.

Frankliniella minuta (Moulton)

Station 12; 16 August; host data unavailable.

Frankliniella occidentalis (Pergande)

Stations 2, 4, and 8; 13 August to 17 September; on Chna, Meof, Mela, Psgl, and Veth.

Thrips nigropilosus Uzel

Station 2; 17 September; Berlese duff of Psgl.

Oxythrips species

Station 2; 17 September; Berlese duff of Psgl.

SUBORDER TUBULIFERA

Family Phloeothripidae

Leptothrips species

Station 2; 17 September; Berlese duff of Psgl.

Neoheegeria verbasci (Osborn)

Station 4 and general area; 13 August; on Veth.

Oedaleothrips (Leptogasterthrips) yosemitae (Moulton)

Station 4 and Visitors Center area; 4 September; Berlese entire plants of Erum.

ORDER HEMIPTERA

Family placement of this order follows the outline of Borror and DeLong (1964). Genera have been arranged alphabetically except in the families Lygaeidae and Miridae.

SUBORDER CRYPTOCERATA

Family Corixidae

Cenocorixa utahensis (Hungerford)

Station 4 and 12; 5 July to 28 July; attracted to black light trap, in beaver pond.

Family Notonectidae

Notonecta undulata Say

Station 10 and 12; 22 July to 26 July; in beaver pond, in flight.

SUBORDER GYMNOCERATA

Family Gerridae

Gerris remigis Say

Station 12; 5 August; on surface of beaver pond.

Family Anthocoridae

Anthocoris melanoceros Reuter

Station 6; 29 August; sweeping foliage of Jusc.

Elatophilus species

General area; 17 June; sweeping foliage of Pifl.

Lyctocoris campestris (Fabricius)

Visitors Center; 17 March; on south-facing window.

Orius tristicolor (White)

General area; 3 July to 29 August; sweeping Chmi, Chna, Sese, and Veth.

Family Miridae

The placement of genera and species follows the recent catalog of Carvalho (1957-1960).

Deraeocoris bakeri Knight

Stations 2, 4, 10, 11, and general area; 9 July to 13 September; on Artr, Chmi, Chna, Chvi, and ERIO.

Deraeocoris hesperus Knight

General area; 27 August; sweeping mixed shrubs.

Deraeocoris nubilus Knight

General area; 2 August to 25 August; sweeping Chmi.

Deraeocoris schwartzii (Uhler)

General area; 21 July; on foliage of Artr.

Chlamydatus associatus Uhler

Station 10 and general area; 17 June to 26 July; sweeping Chmi, and Syva.

Chlamydatus species

General area; 3 July to 12 July; sweeping Psgl, attracted to white light.

Europiella species

Station 11; 13 July; sweeping Artr.

Macrotylus infuscatus Van Duzee

Visitors Center area; 5 July; sweeping Meof.

Phyllopidea picta (Uhler)

General area; 3 July to 4 July; on Psgl and Rowo.

Plagiognathus species

General area; 20 June to 22 June; on flowers of Basa.

Psallus species

Sunset Cone; 28 June; sweeping foliage of Psgl.

Orectoderus species

Visitors Center area; 13 July; sweeping Meof.

Dicyphus (Dicyphus) cucurbitaceus (Spinola)

Station 10; 19 July to 30 August; sweeping Chmi.

Strongylocoris stygicus (Say)

Station 1; 27 August; sweeping mixed shrubs.

Strongylocoris species

Stations 2, 11, and 12; 9 July to 14 August; sweeping Artr.

Hadronema (Aoplonema) princeps ? Uhler

Station 1, 2, 8, and 11; 5 July to 27 August; on Artr, Chdo, Chna, sweeping streamside vegetation.

Hadronema (Aoplonema) uniformis Knight

Station 3; 11 July; sweeping flowering Crac.

Hadronema (Hadronema) militare (Uhler)

Station 6 and general area; 4 July to 14 July; on Luca, LUPI, and Rowo.

Hadronema simplex Knight

Visitors Center area; 4 July; on foliage of Rowo.

Ilnacorella argentata Knight

Station 3; 22 June; sweeping flowering Basa.

Labopidea species

Station 11; 13 July; on Artr.

Lopidea species

Station 3; 3 July; on foliage of Erum.

Orthotylus coagulatus (Uhler)

Station 10; 3 July to 26 July; on Veth.

Orthotylus species

Stations 3, 6, and 11; 13 June to 14 July; on Basa, Liru, and LUPI.

Pilophorus species

General area; 14 July to 25 July; on Pifl and Psgl.

Adelphocoris superbus (Uhler)

Station 12; 14 August to 16 August; on Cica.

Dichrooscytus irroratus Van Duzee

Station 6; 29 August; sweeping foliage of Jusc.

Dichrooscytus species

Station 6; 29 August; sweeping foliage of Jusc.

Irbisia pacificus (Uhler)

Station 11; 5 July; sweeping mixed shrubs.

Lygus desertus Knight

Stations 3, 4, 10, and general area; 15 June to 13 September; on Acla, Basa, Chmi, Chna, Chvi, Hean, and Meof, attracted to black light trap.

Lygus elisus Van Duzee

Station 1, 6, 12, and general area; 5 July to 10 August; sweeping Chmi, Hela, and Urly.

Lygus hesperus Knight

Stations 2, 6, 11, and 12; 15 July to 17 September; on Acla, Chmi, Berlese flowers of Chna, on Elco, Hean, LUPI, Potr 2, and Veth.

Lygus nigropallidus Knight

Station 6; 14 July; on LUPI.

Lygus shulli Knight

Station 6; 14 July to 10 August; on LUPI.

Lygus solidaginis (Kelton)

Station 1; 13 June to 27 July; on foliage of Hela.

Neoborella species

Station 12; 28 July; attracted to black light trap.

Orthops scutellatus Uhler

Stations 1 and 12; 23 June to 14 August; on Alte, Hela, Rice, and unidentified Umbelliferae.

Phytocoris species

Stations 2, 4, 6, 8, 11, and general area; 5 July to 12 September; on Chna, Berlese plants of Mela, on Psgl, attracted to black light trap, Malaise trap.

Polymerus diffusus (Uhler)

Station 2; 3 July to 12 July; sweeping PENS.

Proba sallei (Stal)

Station 1 and general area; 13 June to 14 August; sweeping Artr and Chna.

Leptopterna ferrugata (Fallen)

Station 3; 11 July; sweeping flowering Chna.

Megaloceroea debilis (Uhler)

Stations 3, 4, 11, and general area; 5 July to 12 July; attracted to white light, in flight.

Stenodema (Stenodema) virens (Linnaeus)

Stations 1, 3, 4, 6, 9, 11, 12, and general area; 18 June to 31 August; on Acla, Basa, Chmi, seedheads of Elco, on Pifl, and unidentified Umbelliferae, attracted to black light trap, Malaise trap.

Family Phymatidae

Phymata americana coloradensis Melin

Station 4; 9 August to 21 August; on Chmi and Chna.

Phymata pennsylvanica Handlirsch

General area; 13 August to 22 August; on flowers of Chmi and Chna.

Family Reduviidae

Rhynocoris ventralis (Say)

Stations 6, 7, 12, and general area; 22 June to 17 July; on Basa, Cica, Pifl, and Rowo.

Spinea spinicollis (Champion)

General area; 28 August; on Chmi.

Zelus socius Uhler

This species was recorded by Harris and Shull (1944).

Family Nabidae

Nabis alternatus (Parshley)

Stations 1. 2. 3. 4. 6. and general area; on Chmi, Chna, Elco, ERIO, Erum, Meof, Psgl, and unidentified Umbelliferae.

Nabis rosipennis (Reuter)

Station 2; 24 August; sweeping mixed shrubs and grasses.

Nabis vanduzeei (Kirkaldy)

Visitors Center area; 15 July; on flowers of Acla.

Family Tingidae

Corythucha distincta Osborn and Drake

Station 12; 14 August; sweeping streamside vegetations.

Corythucha immaculata Osborn and Drake

Station 3; 13 June to 22 June; sweeping Basa.

Corythucha mollicula Osborn and Drake

Station 12; 23 June to 27 June; sweeping Hela.

Hesperotingis occidentalis Drake

General area; 14 August; sweeping Chna.

Family Neididae

Acanthophysa echinata Uhler

This species was not taken during 1964 or 1965. Its occurrence in the Monument is based on the record of Harris and Shull (1944).

Jalysus wickhami Van Duzee

General area; 28 July to 30 August; sweeping Chmi, Chna, and Rice.

Neides muticus (Say)

Station 2 and general area; 26 July to 31 August; sweeping Chmi and Psgl.

Family Lygaeidae

Genera and species follow the recent catalog of Slater (1964).

Lygaeus kalmii kalmii Stal

Station 11 and 12; 14 June to 31 August; on Chdo and Chna.

Melanocoryphus admirabilis (Uhler)

Station 3; 22 June; sweeping Basa.

Melanocoryphus bicrusis (Say)

Station 12 and general area; 8 August to 12 September; on Chna and Sese.

A copulating pair were seen on flowers of Sese on 8 August.

Nysius angustatus (Uhler)

Visitors Center area; 5 July; sweeping flowering Meof.

Nysius ericae Auctorum

Stations 4, 5, 8, 9, 10, and general area; 14 June to 13 September; on Acla, Artr, Basa, Chna, Chvi, Cost, Crac, Elco, Hean, LUPI, Mina, Phle, Ptte, and Veth, Malaise trap.

Nysius raphanus Howard

Stations 1, 5, 10, 11, and general area; 17 June to 13 September; on Acla, Basa, Chna, Phle, Pifl, and Putr.

Nysius strigosus Uhler

This species was recorded by Harris and Shull (1944).

Nysius tenellus Barber

Stations 6, 9, 11, and general area; 23 June to 13 September; on Acla, Artr, Chna, and Chvi, Malaise trap.

Ortholomus scolopax Say

Stations 2, 10, and general area; 29 July to 1 September; sweeping Chmi and Psgl.

Kleidocerys franciscanus (Stal)

Station 4, 10, and general area; 15 June to 30 August; sweeping Chmi, Elco, Pifl, and Prvi.

Geocoris pallens pallens Stal

Station 10 and general area; 1 July to 13 September; on Acla, Chna, Meof, and Phle.

Heterogaster behrensii (Uhler)

Station 12; 23 June; sweeping Hela.

Malezonotus sodalicius (Uhler)

General area; 14 April; on bark of Pifl.

Family Coreidae

Chelinidea vittiger Uhler

Sunset Cone; 6 July; on foliage of Oppo.

Coriomeris humilis (Uhler)

General area; 11 August; on flowers of Chvi.

Leptoglossus clypealis Heidemann

General area; 27 June to 8 September; on Cost and Pifl.

Many specimens were seen on the green cones of Pifl in late July.

Family Rhopalidae

Arhyssus barberi Harris

General area; 26 June to 12 September; sweeping Basa, Cost, on ground.

Arhyssus crassus Harris

Stations 3 and 12; 20 June to 22 June; on Basa.

Arhyssus scutatus (Stal)

Station 6 and general area; 10 August to 10 September; sweeping plant foliage.

Aufeius impressiocollis Stal

This species was recorded from the Monument by Harris and Shull (1944).

Harmostes reflexulus (Say)

Stations 6, 12, and general area; 22 June to 11 August; on Basa, Chna, Chvi, Cica, Pifl, and Sese.

Two pairs of this species were in copulations on flowers of Cica on 15 and 16 July.

Liorhyssus hyalinus (Fabricius)

Station 10 and general area; 26 July to 4 September; sweeping Hean.

Stictopleurus plutonius (Baker)

General area; 21 July to 3 September; on Artr and Chna.

Family Coriscidae

Alydus calcaratus (Linnaeus)

Station 2 and 12; 14 July to 27 August; sweeping Potr 2, Malaise trap.

Alydus eurinus (Say)

Station 2 and 12; 14 July to 5 September; Malaise trap.

One specimen was found inside the decomposed body cavity of a deer mouse on 5 September.

Tollius setosus (Van Duzee)

This species was recorded from the Monument by Harris and Shull (1944).

Family Aradidae

Aradus acutus Say

Station 12; 23 June; on bark of dead Potr.

Aradus lugubris Fallen

General area; 9 July; on Pifl.

Aradus vadosus Van Duzee

Station 12; 23 June to 6 July; on bark of dead Potr.

Family Saldidae

Saldula explanata (Uhler)

Station 12; 18 July; on ground near stream.

Family Cydnidae

Allocoris virilis McAtee and Malloch

This species was recorded from the Monument by Harris and Shull (1944).

Cynoides ciliatus (Uhler)

Station 11; 5 July; sweeping mixed shrubs.

Family Corimelaenidae

Corimelaena extensa Uhler

Station 12; 14 August to 17 August; on Veth.

Corimelaena virilis McAtee and Malloch

Station 12 and general area; 13 June to 10 August; sweeping Veth and Wyam.

Family Scutelleridae

Homaemus aeneifrons consors Uhler

Station 6 and general area; 27 June to 13 September; on flowers of Acla, on Artr, Chna, and Cost.

Homaemus bijugis Uhler

Station 12; 28 August; on flowers of Acla.

Family Pentatomidae

Aelia americana Dallas

General area; 5 July to 11 July; on flowers of Crac and Luca.

Apateticus antarius ? Van Duzee

Station 12; 14 August; sweeping streamside vegetation.

Apateticus crocatus Uhler

Station 1, 6, and 11; 24 August to 31 August; sweeping Chna, Jusc, and Sese.

Carpocoris remotus Hovarth

General area; 22 June to 21 August; on Basa and Chna.

Chlorochroa liguata (Say)

Stations 2, 3, 4, 6, 7, 8, and general area; 22 June to 6 September; on Artr, Basa, Chna, Cica, Pifl, Psgl, and Putr.

This species was found on plants of Basa in June. In August and September, specimens were most abundant on cones of Pifl and on the ground under dead Artr and Putr.

Chlorochroa persimilis Horvarth

Station 12 and general area; on Basa, on ground.

Chlorochroa uhleri Stal

Stations 3, 11, and 12; 20 June to 6 September; on Basa, Chna, Chvi, and Ptte.

One specimen was prey to Stenopogon inguinatus Loew (Asilidae).

Eurygaster species

General area; 19 August; nymphs on Erde.

Neottiglossa tumidifrons Downes

This species was recorded by Harris and Shull (1944).

Peribalus abbreviatus Uhler

General area; 19 June to 1 July; on Pifl.

Peribalus limbolarius (Stal)

General area; 17 August to 12 September; on Chna and Veth.

Perillus species

General area; 12 July; nymphs on Putr branches.

The colorful nymph of this species was found in large numbers on the foliage of Putr exclusively.

Thyanata pallidovirens pallidovirens Stal

General area; 20 June to 12 September; on Basa and Chna.

Trichopepla grossa Van Duzee

General area; 26 June; on ground.

ORDER HOMOPTERA

Family placement of this order follows Borror and DeLong (1964). Genera and species are listed alphabetically.

SUBORDER AUCHENORRHYNCHA

Family Cicadidae

Okanogana bella Davis

Station 12 and general area; 19 June to 7 July; on Alte, Elco, and Hela.

Okanogana oregona Davis

Station 12; 24 June; on Urly.

Family Membracidae

Campylenchia latipes (Say)

Visitors Center area; 7 July; sweeping Meof.

Palonica pyramidata Uhler

Station 12; 14 August; on bark of SALI.

Publilia modesta Uhler

General area; 16 June to 22 August; on Chna and Cica.

A colony of nymphs was found established on the main stem of a large Cica.

Stictocephala species

General area; 19 July to 14 August; sweeping Pifl and Putr.

Tortistilus wickhami Van Duzee

Station 2, 6, 11, and general area; 7 July to 10 August; sweeping Chna, Meof, Malaise trap.

One specimen was prey to Efferia benecticti (Bromley) (Asilidae).

Family Cicadellidae

Acinopterus species

General area; 28 August; on ERIO.

Balclutha species

General area; 14 August; sweeping plant foliage.

Ballana venditarius (Ball)

General area; 7 July; on plant foliage.

Chlorotettix species

General area; 11 August; sweeping foliage of Chvi.

Circulifer tenellus (Baker)

General area; 19 September to 1 October; sweeping mixed shrubs.

Colladonus species

General area; 22 June to 6 September; on Basa, Chna, Prvi, Rice, and Sese.

Cuerna species

General area; 14 August; sweeping shrubs.

Dicraneura species

General area; 18 July to 1 August; sweeping Sese.

Empoasca species

General area; 3 July to 13 September; on Chna.

Exitianus species

General area; 29 July; sweeping Acla.

Graminella species

General area; 1 August; sweeping shrubs.

Gypona species

General area; 15 July; on Pifl.

Idiocerus species

Station 2 and Visitors Center area; 28 July to 30 August; on Chna, attracted to black light trap.

Macrosteles species

General area; 13 August to 13 September; sweeping Chna, attracted to white light.

Norvellina tenellus (Baker)

General area; 6 July; on foliage of Putr.

Oncopsis species

General area; 14 August; sweeping shrubs.

Parabolocratus species

General area; 3 July to 5 July; sweeping LUPI and Psgl.

Psammotettix species

General area; 11 August; sweeping Chna.

Stragania species

General area; 27 August to 13 September; sweeping Chna.

Family Cercopidae

Aphrophora species

Station 8; 8 July; on Luca.

A large colony of nymphs were feeding on the lower stems of Luca.

Clastoptera arborina Ball

Station 6; 29 August; sweeping Jusc.

Clastoptera brunnea Ball

Station 6 and 11; 26 July to 29 August; sweeping Artr, Chmi, and Jusc.

Clastoptera delicata Uhler

General area; 12 September; sweeping Chna.

Neophilaenus lineatus (Linnaeus)

Station 1, 2, and general area; 4 July to 13 September; sweeping Artr, Chna, Chvi, ERIO, Meof, and Rowo.

Family Delphacidae

Eurysa species

General area; 1 August; sweeping shrubs.

Stobaera species

General area; 15 June; sweeping Chna.

Family Dictyopharidae

Scolops (Belonocharis) abnormalis Ball

General area; 25 August; sweeping ERIO.

Family Cixiidae

Oecleus obtusus Ball

General area; 28 July to 1 August; sweeping plant foliage.

SUBORDER STERNORRHYNCHA

Family Psyllidae

Aphalara loca ? Caldwell

General area; 1 July; sweeping Pifl.

Arytaina pubescens Crawford

General area; 6 July; on plant foliage.

Psylla coryli Patch

Station 5 and general area; 22 June to 1 August; sweeping Putr.

Psylla galeaformis Patch

Station 12; 14 August; sweeping Alte.

Psylla ribesiae (Crawford)

Station 2 and general area; 1 August to 31 August; sweeping Psgl.

Family Aphididae

The collected material of this family is under the study of L. M. Russell, U. S. National Museum, Washington, D. C. Specific records are not yet available.

Family Coccidae

Phenacaspis penifoliae (Fitch)

General area; 26 August; on needles of Pifl.

Family Pseudococcidae

Chorizoccus species

Station 6; 28 July to 17 September; on Ptte roots.

Phenacoccus defectus Ferris

General area; 24 June; host record unavailable.

ORDER RAPHIDIODEA

Family Raphidiidae

Agulla adnixa (Hagen)

Station 1; 23 June; sweeping Urly.

Agulla assimilis ? (Albarda)

General area; 25 August; sweeping Chmi.

Agulla modesta Carpenter

Station 12; 14 August; sweeping streamside vegetation.

ORDER NEUROPTERA

Family Chrysopidae

The collected specimens of this family are under the study of Ellis G. MacLeod, Harvard University, Cambridge, Massachusetts. Specific records are not yet available.

Family Coniopterygidae

Aleuropteryx species

Station 2; 7 July; sweeping SALI.

Coniopteryx species

Station 9; 21 June; Malaise trap.

Malacomyza species

Station 11; 13 July; Malaise trap.

Family Hemerobiidae

Hemerobius pacificus Banks

Stations 2, 6, 11, and 12; 14 July to 1 September; sweeping Jusc and Psgl, Malaise trap.

Hemerobius stigmaterus Fitch

Station 9; 18 June to 22 June; sweeping Elco and Pifl, Malaise trap.

Kimminsia coloradensis (Banks)

Stations 2, 8, 9, and 11; 19 June to 23 July; attracted to white light, Malaise trap.

Sympherobius killingtoni Carpenter

Station 3; 23 August; Malaise trap.

Micromus montanus ? (Hagen)

Station 12; 11 August; Malaise trap.

Micromus variolosus Hagen

Station 3, 9, 11, and 12; 21 June to 21 August; Malaise trap.

Family Myrmeleontidae

Hesperoleon brunneus Currie

Station 11 and Visitors Center and Residential area; 14 July to 8 August; attracted to white light, Malaise trap.

ORDER COLEOPTERA

The placement of families, genera, and subgenera follows the manual of Arnett (1960-1962).

SUBORDER ADEPHAGA

Family Carabidae

Carabus (*Oreocarabus*) *taedatus oregonensis* LeConte

Station 1 and 12; 23 June to 5 September; on ground.

Elaphrus (*Elaphrus*) species

Stations 2, 4, and 12; 14 July to 24 July; attracted to black light trap, on ground.

Bembidion (*Peryphus*) *bimaculatum* Kirby

Visitors Center and Residential area; 20 July; attracted to black light trap.

Bembidion (*Peryphus*) *immaculosum* Hatch

Visitors Center and Residential area; 24 January to 28 July; attracted to black light trap, on window.

This species was found in the Visitors Center in January and March on the large south-facing windows on sunny days.

Bembidion (*Peryphus*) *nebraskense* LeConte

Stations 4, 6, 12, and general area; 5 July to 5 September; on flowers of *Chna*, attracted to black light trap, on ground.

Bembidion (Peryphus) obscurellum fusicrus Motschoulsky

Stations 4 and 12; 5 July to 28 July; attracted to black light trap.

Bembidion (Peryphus) rupicola Kirby

Stations 1, 12, and Visitors Center and Residential area; 13 June to 19 September; swept from flowers of unidentified Umbelliferae, attracted to black light trap, in lawn grass clippings, under rocks, at stream edge.

Pterostichus (Hypherpes) protractus LeConte

Stations 6 and 12; 24 June to 5 September; on ground, under leaves.

Pterostichus (Bothriopterus) oregonus LeConte

Station 12; 19 November; in duff of rotten Potr or Potr 2 log.

Agonum (Agonum) placidum Say

Visitors Center; 12 July; attracted to white light.

Amara (Curtonotus) laticollis LeConte

General area; 12 July; on ground.

Amara (Bradytus) apricaria Paykull

Visitors Center and Residential area; 27 June to 14 July; in lawn grass clippings, on ground.

Amara (Celia) amplicollis Mannerheim

General area; 28 July; under rocks.

Amara (Celia) erratica Sturm

General area; 6 March to 19 June; under boards, under rocks.

Several specimens were observed on the southwest slope of Sunset Cone under rocks at the edge of the snow line in March.

Amara (Celia) farcta LeConte

General area; 26 June; on limbs of Pifl.

Amara (Celia) quenseli Schonherr

Station 12 and general area; 22 July to 5 September; on ground.

Amara (Amara) impuncticollis Say

General area; 11 July to 19 July; on ground, sweeping shrub foliage.

Amara (Amara) species

General area; 14 June to 22 August; on limb of Pifl, on ground.

Harpalus (Harpalus) basilaris Kirby

General area; 25 June to 11 July; on Cost, on ground.

Harpalus (Harpalus) fraternus LeConte

Station 6, 12, and general area; 13 June to 5 September; on Pifl, attracted to white light, on ground, under rocks.

This species was most common under rocks at the stream edge south of station 12.

Lebia furcata aberration debiliceps Casey

Station 6; 10 August; sweeping shrub foliage.

Lebia guttula LeConte

Station 4, general area; 8 August to 5 September; on foliage of Chna, attracted to white light.

Apristus laticollis LeConte

Station 12; 20 June; on ground.

Cymindis brevipennis Zimmerman

Station 10; 14 September; under wet cardboard.

Family Dytiscidae

Laccophilus decipiens LeConte

Station 2 and 12; 8 August to 10 August; in water.

This species was abundant in the small, articifical stream of water at the bottom of the horse pasture at station 2.

Hygrotus obscureplagiatus Fall

Station 12; 10 August; in beaver pond.

Hydroporus (Heterosternus) planiusculus Fall

Station 12; 10 August; in beaver pond.

Hydroporus (Potamonectes) striatellus LeConte

Stations 2 and 12; 22 July to 10 August; in beaver pond, in small stream.

This species was abundant in the small stream of water at the bottom of the horse pasture at station 2.

Agabus lugens LeConte

Station 1; 24 June; at edge of stream.

Agabus seriatus intersectus Crotch

Station 12; 10 August; in beaver pond.

Agabus tristis Aube

Station 12; 22 July; in beaver pond.

Rhantus binotatus Harris

Station 12 and general area; 10 August to 10 September; in beaver pond, on ground.

Rhantus hoppingi Wallis

Stations 2 and 12, general area; 28 July to 10 August; in beaver pond, in small stream (station 2).

SUBORDER POLYPHAGA

Family Hydrophilidae

Berosus fraternus LeConte

Visitors Center and Residential area; 20 July; attracted to black light trap.

Sphaeridium lunatus Fabricius

Station 10; 10 September; on dead mule deer.

Family Staphylinidae

Carpelimus (Carpelimus) diffusus Casey

Stations 7, 8, and 12, general area; on Erum, attracted to black light trap, sweeping streamside vegetation.

Platystethus americanus Erichson

Station 2; 29 July; foliage of Psgl.

Pelecomalium puberulum Fauvel

Station 12; 14 June to 7 July; on Cost and Hela.

Phlaeopterus brevipennis Casey

Station 1; 24 June; under rocks at stream edge.

Deliphrum occidum Casey

Station 4; 22 June; attracted to white light.

Stenus species

General area; 19 August; on ground.

Sunius (Hypomedom) peregrina Casey

Visitors Center; 24 January; on window.

This species was found in the Visitors Center on the large south-facing windows on a sunny day.

Staphylinus maxillosus villosus Gravenhorst

Visitors Center and Residential area; 11 August to 15 August; on garbage cans.

Philonthus (Philonthus) concinnus Gravenhorst

Station 4 and general area; 24 June to 18 July; in fly trap, on dead yellowbelly marmot.

Philonthus (Philonthus) cruentatus Gmelin

Station 12 and general area; 25 June to 19 November; on dead yellowbelly marmot, in duff of Potr.

Philonthus (Philonthus) politus Linnaeus

Visitors Center; 22 June swept from foliage of Cost.

Philonthus (Philonthus) stace-smithi Hatch

Station 12; 5 September; on ground.

Philonthus (Philonthus) species

Station 2 and general area; 24 January to 17 September; on Chmi, duff of Psgl, on window.

One specimen was taken from the large south-facing window in the Visitors Center on a sunny day.

Philonthus (Gabrius) wawawai Hatch

Stations 3, 4, and general area; 6 March to 21 July; on cinder, on dead yellowbelly marmot.

Several specimens were seen on a southwest facing cinder slope at the edge of the snow line in March.

Heterothops fumigatus LeConte

Station 2; 25 July; on foliage of Psgl.

Quedius (Quedius) lanei Hatch

Station 12; 19 November; in duff of Potr.

Quedius (Microsaurus) limbifer Horn

Station 12; 19 November; in duff of Potr.

Tachinus angustatus Horn

Stations 1, 2, 3, 6, 9, and 12, Visitors Center and Residential area, general area; 11 June to 17 September; on flowers of Basa, Berlese duff of Psgl, Berlese plants of Ptte, on unidentified Umbelliferae, on ground, under boards.

This was the most common species of Staphylinidae seen in the Monument.

Aleochara (Coprochara) bimaculata Gravenhorst

Station 10; 10 September; on dead mule deer.

Aleochora (Coprochara) recta Casey

Station 4; 18 July; in meat trap.

Family Silphidae

Necrodes ramosa (Say)

Station 1; 5 July; on ground.

Silpha (Thanatophilus) lapponica Herbst

Station 4 and general area; 24 June to 28 July; in fly trap, on dead yellowbelly marmot, on ground.

Nicrophorus guttulus Motschoulsky

General area; 12 July to 15 July; on ground.

Nicrophorus hecate hecate Bland

Station 4, Visitors Center and Residential area; general area; 18 June to 21 August; on dead yellowbelly marmot, in fly trap, on garbage can, on ground.

Nicrophorus investigator investigator Zetterstedt

Station 4 and general area; 25 June to 28 July; in fly trap, on dead yellowbelly marmot, on ground.

Family Ptiliidae

Acratrichis species near vicina Matthews

Station 2; 17 September; Berlese Psgl duff.

Family Histeridae

Saprinus fibriatus LeConte

Station 4, 10, and general area; 25 June to 10 September; on dead Great Basin rattlesnake and dead mule deer.

Saprinus lubricus LeConte

General area; 25 June to 25 August; on Chmi, on dead yellowbelly marmot.

Saprinus lugens Erichson

Station 4, Big Craters, Visitors Center and Residential area, and general area; 24 June to 14 August; in fly trap, on dead Great Basin rattlesnake, dead yellowbelly marmot, in garbage cans, on ground.

Saprinus oregonensis J. LeConte

Station 4 and Visitors Center and Residential area; 24 June to 17 July; in lawn grass clippings, on dead yellowbelly marmot.

Gnathoncus nanus Scriba

Station 4; 18 July; in domicile.

Carcinops quatuordecimstriatus Stephens

Station 4; 14 August; on ground.

Family Lucanidae

Platycerus piceus marginalis Casey

Station 6; 15 June; on dead stem of Artr.

Family Scarabaeidae

Aphodius denticulatus Haldeman

Station 4; 14 July; attracted to black light trap.

Aphodius granarius (Say)

Visitors Center and Residential area; 20 June; attracted to black light trap.

Serica anthracina LeConte

Station 11; 5 July; on flowers of Erum.

Serica curvata LeConte

General area; 19 July to 4 August; attracted to black light trap, on ground.

Serica cuyamaca Saylor

Station 12; 28 July; attracted to black light trap.

Polyphylla decemlineata Say

Visitors Center and Residences area; 18 July to 15 August; on ground.

Cremastocheilus crinitus biforeatus Van Duzee

Station 11; 20 June to 7 July; in flight, on ground.

Trichiotinus assimilis (Kirby)

Station 1, 11, and 12; 24 June to 8 August; on flowers of Cica, Civu, Hela, Sese, and XANT.

This species was found most often deep in the flower heads of Cica and Civu at Station 12.

Family Helodidae

Cyphon concinnus LeConte

Station 12; 29 June to 5 July; on MERT and Potr.

Family Heteroceridae

Heterocerus brunneus Melsheimer

Station 4; 5 July; attracted to black light trap.

Heterocerus tristis Mannerheim

Visitors Center and Residential area; 30 June; attracted to black light trap.

Family Buprestidae

Dicerca frosti Nelson

Station 12; 22 June; on branch of Artr.

Dicerca tenebrica (Kirby)

Station 12; 20 June to 16 August; on Potr.

The majority of specimens were taken from a 40 cm diameter Potr log that had been felled by beaver in the fall of 1964.

Dicerca tenebrosa (Kirby)

West of Devils Orchard area; 14 April; in Pifl.

Approximately 30 dead adult specimens were found in the wood near the base of a 50 cm diameter dead Pifl. Apparently they had died prior to emergence.

Poecilonota montana Chamberlain

South of Devils Orchard; 15 July; on bark of Pifl.

Buprestis aurulenta Linnaeus

Big Craters area; 13 June to 7 August; on foliage of Pifl.

Buprestis langi (Mannerheim)

Station 12; 14 August; in flight.

Melanophila acuminata (DeGeer)

West of Devils Orchard area; 14 April; one specimen found dead.

Melanophila intrusa Horn

Station 5 and 6, general area; 22 June to 4 September; on bark of Pifl; reared from Pifl limbs.

Anthaxia expansa LeConte

General area; 21 July; general sweeping of foliage.

Anthaxia retifer LeConte

Station 2 and general area; 7 July to 14 July; general sweeping of vegetation.

Anthaxia simiola Casey

Station 12 and north side of Sunset Cone; 28 June to 19 July; on flowers of Erde and Erla.

Chrysobothris breviloba Fall

Stations 5, 6, and general area; 22 June to 9 July; on Pifl, Malaise trap.

Chrysobothris femorata (Olivier)

Station 12; 5 July to 10 July; on dead Potr.

Chrysobothris fragariae Fisher

Stations 7, 8, and 11; 3 July to 16 July; on Erde, Erov, and Phle.

Chrysobothris species nova

Station 8; 18 June; on cinder.

Chrysophana placida (LeConte)

General area; 18 June to 22 June; on foliage of Pifl and on seed cones of Pifl.

Acmaeodera species

Station 12; 20 June to 28 July; on flowers of Erla.

Agrilus politus Say

Station 2; 1 August; on foliage of SALI.

Family Elateridae

Ampedus ursinus (Van Duzee)

Station 12 and Grassy Cone; 13 June to 17 June; on Psgl, under rocks.

Agriotella fusca Lane

General area; 29 June; on Phle.

Limonius aeger LeConte

East side of Grassy Cone; 17 June; sweeping Psgl.

Athous rufiventris Eschscholtz

Station 12; 14 August; sweeping Alte.

Hemicrepidius carbonatus (LeConte)

Station 12; 16 July; on flowers of Cica.

Ctenicera carbo (LeConte)

Station 12; 24 June; on ground.

Ctenicera castanicolor (Fall)

Station 12; 23 June to 5 July; on Potr, on ground.

Ctenicera glauca (Germar)

Station 12 and general area; 22 June to 27 June; on flowers of Cica, on foliage of Pifl, Ptte, on flowers of Wyam.

Ctenicera nebraskensis (Bland)

Station 9 and general area; 22 June to 29 June; on Pifl and Psgl, Malaise trap.

Ctenicera nigricollis (Bland)

Station 2; 26 June to 25 July; sweeping Psgl.

Ctenicera pudica (Brown)

Station 12 and general area; 10 July to 11 August; Malaise trap, sweeping vegetation.

Dalopius fuscatus Brown

Station 1 and general area; 22 June to 7 July; on Elco and Prvi, unidentified Umbelliferae.

Negastrius pectoralis (Say)

General area; 6 March to 23 August; on cinder.

In March, several specimens were observed crawling on a southwest cinder slope at the edge of the snowline.

Melanotus texanus Candeze

Station 12 and general area; 11 June to 26 June; sweeping mixed grasses (mostly Elco), attracted to black light trap, on ground.

Cardiophorus tenebrosus LeConte

Stations 6, 12, and general area; 20 June to 23 November; on Pifl and Putr, on ground, under rocks.

Six specimens were found under an one meter rock at station 12 in November.

Family Eucnemidae

Anelastes druryi Kirby

Visitors Center and Residential area; 4 August; attracted to black light trap.

Family Cantharidae

Podabrus falli R. and G. Hopping

Station 2, 7, 11, and 12, general area; 14 June to 13 July; on flowers of Chvi, Phle, on Pifl, on ground.

Podabrus piniphilus Dejean

Stations 1 and 12; 22 June to 23 June; on flowers of Hela.

Podabrus pruinosus diversipes Fall

Stations 1, 12, and general area; 20 June to 21 July; on Alte, Artr, Cica, and Hela, on ground.

Family Lampyridae

Pyropyga fenestralis Melsheimer

Station 12; 13 August; Malaise trap.

Family Dermestidae

Dermestes frischi Kugelann

Station 4; 24 June to 18 July; in fly trap, on dead yellowbelly marmot.

Dermestes lardarius Linnaeus

Visitors Center; 24 January; on floor.

One specimen was crawling on the floor of the Visitors Center lobby in January.

Dermestes marmoratus Say

Station 4 and general area; 24 June to 26 July; in fly trap, on dead yellowbelly marmot.

Dermestes undulatus talpinus Mannerheim

Station 4 and general area; 19 June to 18 July; in fly trap, on dead yellowbelly marmot.

Orphilus niger Rossi

General area; 9 August; on flowers of Chmi.

Anthrenus lepidus LeConte

Station 1 and 12; 15 July to 18 July; on Cica and Hela.

Anthrenus lepidus aberration pictus Casey

Visitors Center and Residential area; 29 June; sweeping vegetation.

Trogoderma simplex Jayne

Station 12; 16 July; on flowers of Cica.

Megatoma giffardi Blaisdell

South side of Grassy Cone; 17 June; on flowers of Basa.

Megatoma variegata Horn

General area; 14 April to 5 July; on Pifl, attracted to man.

Family Anobiidae

Ptilinus lobatus Casey

Station 12; 6 July to 15 July; from borings in Potr.

Family Ostomidae

Tenebriodes occidentalis Fall

Station 6; 24 June to 15 September; bark of Pifl.

Family Cleridae

Phyllobaenus scaber LeConte

General area; 28 August; on ERIO.

Phyllobaenus species

Station 2; 14 July; sweeping vegetation.

Enoclerus acerbus Wolcott

Station 8; 5 July; Malaise trap.

Enoclerus lecontei (Wolcott)

Station 6 and general area; 22 June to 30 July; on flowers of CALO, on bark of dead Pifl.

Trichodes ornatus Say

Stations 7, 11, and general area; 15 June to 12 August; on flowers of Acla, Basa, CALO, Chmi, Chna, Erde, Erov, Erum, Phle, Pops, POTE, and Rowo.

This species appeared to prefer the flowers of all species of ERIO.

Chariessa pilosa Forster

Station 12; 8 August; on ground.

Necrobia violacea Linnaeus

General area; 10 September; on ground.

Family Melyridae

Collops bipunctatus Say

General area; 15 July to 17 August; on flowers of Acla and Veth.

Malachius horni (Fall)

Stations 4, 9, and 12, Sunset Cone, general area; 14 June to 14 July; on Elco, Hela, Pifl, and Urly, Malaise trap, sweeping mixed grasses (mostly Elco).

Two specimens were taken from Pifl rearings.

Tanaops ignitus aberration nunenmacheri Marshall

General area; 19 July to 25 August; sweeping Chmi and Chvi.

Tanaops species

General area; 13 July; on flowers of Phle.

Hypebaeus bicolor LeConte

General area; 19 July; on bark of Pifl.

Attalus glabrellus Fall

General area; 28 August; on flowers of ERIO.

Attalus morulus smithi Hopping

Station 6 and general area; 14 July to 4 September; on Chna, Hela, Phle, Pifl, Psgl, and Rice.

Attalus oregononensis Horn

Station 11 and south side of Sunset Cone; 12 July to 16 July; on flowers of Oprh and Phle.

Eurelymis atra LeConte

Station 2 and 12, general area; 19 June to 14 July; on Chna, Erde, Potr, and Psgl.

Dasytes cruralis LeConte

General area; 29 June to 26 July; on foliage of Phle and Psgl.

Hoppingiana hudsonica LeConte

Stations 4 and 12; 25 June to 14 July; on flowers of Cica, on Elco.

Hoppingiana nitida Hatch

Station 6; 18 June to 10 August; on flowers of Erde, sweeping shrub foliage.

Mecomycter omalinus Horn

General area; 21 August; on Chna.

Trichochrous condonensis Hatch

Station 2, 3, and 12; 25 June to 13 July; on flowers of Chdo and Cica.

Trichochrous musculus Hatch

Station 2, 11, and general area; on Chdo and Crac.

Trichochrous species

General area; 12 July to 21 August; on flowers of Chna and Oprh.

Amecocerus quadricollis Hatch

Stations 2, 3, 5, 9, Grassy Cone, and general area; 13 June to 21 July; on flowers of Basa, Chmi, on Elco, sweeping Meof, on Pifl, Prvi, Putr, Malaise trap.

Amecocerus suckeri Hatch

General area; 14 July; on LUPI.

Amecocerus trifasciatus Hatch

Station 2 and general area; 21 June to 18 July; on Chdo, Meof, and Pifl.

Amecocerus species

General area; 15 June to 21 August; on Chna, Oppo, Ptte, and Ruoc, sweeping shrub foliage.

Family Meloidae

Lytta vulnerata cooperi LeConte

Station 3, 11, and general area; 27 July to 31 August; feeding on flowers of Chna and Chvi.

Epicauta normalis Werner

General area; 5 July; on blossoms of Luca.

Epicauta puncticollis (Mannerheim)

Stations 1, 11, 12, and general area; 3 June to 21 August; on flowers of Acla, Agur, Basa, Chna, Chvi, Cica, Erum, Sese, Wyam, and XANT.

This species was seen only north of the highway and was particularly abundant at station 1.

Linsleya spaericollis (Say)

Stations 4, 11, and 12; 11 July to 17 August; on Chna, Malaise trap.

Nemognatha (Meganemognatha) lurida apicalis LeConte

General area; 4 September; on flowers of Hela.

Nemognatha (Meganemognatha) lutea dichroa LeConte

Stations 11 and 12, general area; 24 June to 11 August; on flowers of Acla, Chna, and Cica.

Nemognatha (Pauronemognatha) nigripennis LeConte

Station 1 and general area; 5 July to 25 August; on flowers of Acla, Chdo, and Chmi.

Family Mordellidae

Mordella atrata Melsheimer

Stations 2, 6, 10, 11, and 12, general area; 23 June to 11 August; on flowers of Chdo, Chmi, Chna, Erov, Erum, Hela, on leaf of Potr, and on flowers of POTE.

Mordellistena asperata Melsheimer

General area; 22 June; on flowers of Basa.

Mordellistena sericans Fall

Stations 4, 9, 12, and general area; 18 June to 26 July; on flowers of Chmi, Hela, and Liru, Malaise trap.

Mordellistena unicolor LeConte

General area; 22 June; on flowers of Basa.

Mordellistena species

General area; 15 June; on foliage of Chna.

Family Rhipiphoridae

Macrosiagon dimidiatum Fabricius

General area; 2 August; on flowers of Chvi.

Family Tenebrionidae

Eleodes (Melaneleodes) rileyi Casey

Station 11 and general area; 27 June to 21 July; on ground and under rocks.

Eleodes (Eleodes) nispilabris connexa Say

General area; 13 June to 29 August; on lawn grass, on ground.

Eleodes (Eleodes) obscura sulicipennis Mannerheim

General area; 23 June to 23 July; on ground.

Eleodes (Blapylis) chordata Eschscholtz

Station 11 and 12; 13 June to 27 June; on ground and under rocks.

Eleodes (Blapylis) nunenmacheri Blaisdell

Station 12 and general area; 13 June to 18 July; on ground and under rocks.

Eleodes (Blapylis) tenebrosa Horn

Station 6 and general area; 20 June to 29 August; on bark of Pifl, on ground.

Eleodes (Metablapylis) nigrina perlonga Blaisdell

General area; 13 June to 28 August; on ground and under rocks.

Eleodes (Utheleodes) cognata Haldeman

Station 8 and general area; 21 June to 10 September; on bark of Pifl, on ground, under rotten Psgl log.

Coniotis oralis oblita (Say)

Station 1 and 3, general area; 13 June to 17 July; on cinder, on ground and under rocks.

Coniontellus subglaber Casey

Station 11; 16 July; on flowers of Erum.

Tribolium madens Charpentier

West of Devils Orchard; 14 April; on dead Pifl.

Coelocnemis californicus Mannerheim

Station 1 and general area; 18 June to 25 June; on ground.

Coelocnemis species nova ?

Station 11; 27 June; under rock.

Family Alleculidae

Pseudocistela pacifica (Hopping)

Station 2; 13 July to 25 July; on Psgl.

Isomira variabilis Horn

General area; 1 August; sweeping plant foliage.

Family Melandryidae

Pentaria trifasciata Melsheimer

General area; 19 July to 29 August; on Chmi, Chna, Phle, and Sese.

Anaspis tufa Say

Station 2 and 12, general area; 5 July to 9 August; on Cost, Chmi, Potr, and Sese.

Nassipa hoppingi Liljeblad

Station 2; 14 July; sweeping shrub foliage.

Family Pedilidae

Pedilus vittatus Horn

Station 1 and 12; 3 June to 5 July; on flowers of Basa and Hela.

Pedilus species

Station 12; 23 June; on foliage of Potr.

Family Anthicidae

Notoxus serratus LeConte

Station 11; 5 July to 17 July; sweeping Artr, sweeping Putr, Malaise trap.

Lappus nitidulus LeConte

Stations 4, 9, and general area; 17 June to 29 August; on Chna and Elco, Malaise trap.

Anthicus hastatus Casey

Visitors Center; 11 August; attracted to white light.

Anthicus praeceps Casey

Visitors Center; 11 August; attracted to white light.

Family Nitidulidae

Cateretes (Pulion) pennatus sericans LeConte

Station 1; 27 June; on flowers of Hela.

Brachypterus pedicarius Linnaeus

Station 3; 22 June; on flowers of Basa.

Brachypterus troglodytes Murray

Sunset Cone; 6 July; on flowers of Oppo.

Carpophilus (Carpophilus) pallipennis (Say)

General area; 25 June to 12 July; on flowers of Cica and Oppo.

Nitidula ziczac Say

Station 4; 19 July; in fly trap.

Family Cucujidae

Cucujus clavipes puniceus Mannerheim

Station 12; 5 September to 13 September; on Alte

On 5 September, adults, pupae, and larvae of several instars were found under the bark of a dead Alte.

Family Cryptophagidae

Cryptophagus species

Station 6; 17 September; Berlese plants of Ptte.

Family Endomychidae

Aphorista laeta LeConte

Station 12; 19 September; in duff of Psme.

Family Coccinellidae

Hyperaspis disconotata Mulsant

Station 12; 18 July; on SALI foliage.

Hyperaspis lateralis Mulsant

Station 6 and general area; 19 July to 3 September; on foliage of Chmi, Chna, Psgl, sweeping shrub foliage.

Hyperaspis lateralis aberration montanica Say

Stations 1, 2, 3, 4, 6, 11, and general area; 28 July to 17 September; on foliage of Artr, Chmi, Chna, Berlese flowers of Chna, on Jusc, in seed cone of Pifl, on Psgl, Malaise trap.

Hyperaspidius vittigera LeConte

Station 11; 5 July; sweeping shrub foliage.

Brachyancantha dentipes Fabricius

Station 12 and general area; 10 August to 17 August; on flowers of Chna.

Brachyancantha ursina uteella Casey

Station 11; 15 July; on flowers of Chna.

Scymnus ardelio Horn

Station 10; 10 September; on dead mule deer.

Scymnus caurinus Horn

Station 2, 11, and general area; 22 June to 14 August; on Artr, Basa, and Psgl, Malaise trap.

Scymnus lacustris LeConte

Station 12 and general area; 21 July to 25 August; on Chna, Cica, ERIO, and Erum, Malaise trap.

Scymnus species

General area; 25 July; on foliage of Psgl.

Psyllobora vigintimaculata taedata LeConte

Station 12; 14 August; sweeping shrub foliage.

Hippodamia apicalis Casey

Station 6, 11, and general area; 12 July to 13 September; on Acla, Artr, Chmi, Chna, and Chvi, sweeping Elco, on stems of Hean, on foliage of Psgl, on flowers of Sese.

Several specimens were observed feeding on unidentified Aphididae on the stems of Hean.

Hippodamia caseyi Johnson

Station 12 and general area; 22 June to 7 July; on flowers of Hela, sweeping Meof.

Hippodamia convergens Guerin-Meneville

Stations 2 and 12, general area; 18 June to 14 September; on Artr, Basa, Chmi, Chna, Crac, Hean, Meof, and Pifl.

One pair was observed in copulation on a leaf of Hean on 26 July.

Hippodamia tredecimpunctata tibialis Say

Station 12 and general area; 24 June to 11 August; sweeping Cost, Malaise trap.

Hippodamia glacialis lecontei Mulsant

Station 10; 26 July; on stems of Hean.

Hippodamia moesta bowditchi Johnson

Station 2; 24 August; sweeping shrub foliage east of the horse pasture.

Hippodamia quinquesignata Kirby

Stations 1, 2, 3, 4, 6, and 10, general area; 15 June to 14 September; on Acla, Artr, Basa, Chmi, Chna, Chvi, Cica, Cost, Crac, sweeping seedheads of Elco, Hean, Phle, Pifl, Sese, Tavu, unidentified Umbelliferae, and Veth, Malaise trap.

Hippodamia sinuata disjuncta Timberlake

Station 10, 12, and Visitors Center; 24 June; sweeping Cost, on Hean, sweeping Meof, Malaise trap.

Coccinella difficilis Crotch

Station 4 and general area; 1 July to 5 September; on Chmi, Chna, Chvi, Crac, Mela, Psgl, and Putr.

Coccinella novemnotata degener Casey

Stations 1, 3, 11, and general area; 22 June to 13 September; on Artr, Chna, Chvi, Crac, Hean, and Ptte.

Coccinella prolongata Casey

Station 1, 3, 12, and general area; on LUPI, Mela, Pifl, Malaise trap.

One specimen was seen feeding on unidentified Aphididae on the upper stems of LUPI at station 12.

Coccinella transversoguttata richardsoni Brown

Stations 1, 2, 11, and general area; 22 June to 14 August; on Artr, Chna, Cica, Cost, Hean, Pifl, Malaise trap.

Several specimens were observed feeding on unidentified Aphididae on Artr and on unidentified Aphididae on Hean. One specimen was reared from a pupa from the underside of a large leaf of Hean.

Mulsantina picta minor Casey

Station 2; 23 July; on Psgl.

Anatis rathvoni LeConte

Station 7; 18 June; on foliage of Ptte.

Neomysia hornii Crotch

General area; 1 July to 3 July; on Pifl.

Brumus septentrionis Weise

Stations 4 and 6; 15 June to 8 August; on foliage of Artr and Chna.

Family Erotylidae

Dacne californica Horn

Grassy Cone; 17 June; in fungus on rotten Psgl log.

Triplax cuneata Boyle

Station 12; 14 June; on mushrooms.

Several adult specimens were collected as they were feeding on the gills of unidentified mushrooms of this stations damp, shady streamside area.

Family Phalacridae

Phalacrus penicillatus Say

General area; 22 June to 13 September; on Basa, Chmi, Chna, and sweeping seedheads of Elco.

Olibrus rufipes LeConte

General area; 10 August to 13 September; on flowers of Chna.

This species was commonly encountered only on flowers of Chna.

Family Lathridiidae

Lathridius minutus Linnaeus

Station 2; 4 September; Berlese Psgl duff.

Family Colyiidae

Aulonium longum LeConte

West of Devils Orchard; summer 1964; taken from Pifl rearings.

Family Cerambycidae

Prionus (Prionus) californicus Motschulsky

General area; 14 August; on Pifl bark

Tragosoma depsarium (Linnaeus)

General area; 15 July; on Pifl.

Arhopalus asperatus (LeConte)

General area; 11 July to 25 August; on Pifl, attracted to white light.

Asemum nitidium LeConte

Station 6 and general area; 24 June to 4 September; on Pifl.

Grammoptera subargentata (Kirby)

Station 12; 23 June to 28 July; on Gene, on ground.

Grammoptera species

General area; 14 August; on Chna.

Anoplodera canadensis Oliver

General area; 11 August; on ground.

Anoplodera crassipes LeConte

General area; 10 August; on ground.

Anoplodera instabilis Haldeman

Stations 1 and 12; 23 June to 1 August; on flowers of Acla, CALO, and Hela.

Anoplodera serpentina (Casey)

General area; 11 August; on flowers of Chna.

Anoplodera tribalteata LeConte

Station 1 and general area; 20 July to 11 August; on flowers of Acla, Hela, Sese, and Veth.

Cortodera longicornis (Kirby)

General area; 11 July; on ground.

Cortodera subpilosa LeConte

Station 3; 20 June to 25 June; on flowers of Basa.

Cortodera species

General area; 17 June to 21 July; on Artr, Chmi, Cica, Erov, Erum, and Prvi.

Toxotus species nova

Stations 1 and 12; 5 July to 28 July; on Civu, Gene, Hela, LUPI, and Urly.

Centrodera spurca LeConte

General area; 12 July to 23 July; on ground.

Centrodera species nova

Visitors Center area; 10 August to 12 August; attracted to white light.

Crossidius ater LeConte

General area; 6 September; on flowers of Chna.

Crossidius hirtipes allgewahri LeConte

Station 6 and general area; 3 September to 12 September; on flowers of Chna.

Crossidius punctatus LeConte

General area; 10 August to 12 September; on flowers of Chna, on bark of live Pifl.

Elatotrypes hoferi Fisher

General area; summer; emerged from limbs of dead Pifl.

Xylotrechus annosus emotus Brown

Station 12; 19 June to 28 July; on trunk of Potr.

Xylotrechus mormonus (LeConte)

General area; 11 July; on ground.

Neoclytus muricatulus muricatulus (Kirby)

General area; summer; reared from dead Pifl.

Monochamus maculosus Haldeman

General area; 14 June to 5 September; on bark of Pifl, attracted to black light trap.

Several specimens were reared from sections of the main trunk of a Pifl tree that had been dead for one year.

Neocanthocinus obliquus (LeConte)

General area; 14 July to 5 September; on Pifl.

Several specimens were reared from large limbs of a two year dead Pifl.

Saperda calcarata Say

Station 12; 28 July; attracted to white light.

Oberea quadricallosa LeConte

Station 2; 13 July; in flight.

Family Chrysomelidae

Zeugophora atra (Fall)

Station 2; 14 July; sweeping vegetation.

Saxinis saucia LeConte

Station 2 and general area; 1 July to 10 August; sweeping shrub foliage.

Pachybrachis caetatus LeConte

Station 11 and general area; 5 July to 10 August; on Chna flowers.

Pachybrachis melanostictus Suffrain

General area; 24 July to 14 August; on Artr and Sese.

Pachybrachis mercurialis Fall

General area; 11 August; on flowers of Chna and Chvi.

Pachybrachis vacillatus Fall

Stations 4, 6, and general area; 17 July to 17 August; on flowers of Chmi, Chna, on foliage of Pifl.

Pachybrachis vau Fall

General area; 5 September; on flowers of Chna.

Pachybrachis species

General area; 11 August; sweeping Chna.

Cryptocephalus sanguinicollis Suffrain

General area; 19 July; on flowers of Phle.

Cryptocephalus spurcus LeConte

Stations 4, 6, 10, and general area; 26 July to 5 September; on flowers of Chna and Chvi.

Myochrous longulus LeConte

Station 11; 9 July; Malaise trap.

Leptinotarsa decimlineata (Say)

Visitors Center and Residential area; 24 June to 15 July; on Cost, sweeping lawn grass.

Larvae were found feeding on potatoes growing in a small garden near a domicle. Adults were seen only near this area and on miscellaneous foliage surrounding the Visitors Center.

Gastrophysa cyanea Melsheimer

Station 1 and Visitors Center area; 23 June to 12 July; on RUME.

Larvae were abundant on RUME until the second week of July. After this time, neither larvae nor adults were seen. The larvae seemed to prefer the edges of a leaf, taking a portion randomly along the margin. Damage ranged from an occasional portion removed to complete leaf defoliation leaving only the stems and central leaf ribs. No feeding damage was noted on the flowers or seed stalks.

Trirhabda canadensis (Kirby)

General area; 11 August; on flowers of Sese.

Trirhabda lewisii Crotch

Stations 2, 6, and 9; 12 July to 10 August; on flowers of Chna.

Trirhabda nitidicollis LeConte

General area; 16 July to 11 August; on Chna and Pifl.

Trirhabda pilosa Blake

Station 2; 24 August; sweeping shrub foliage below the horse pasture.

Galerucella luteola Muller

General area; 24 June; sweeping Cost.

Monoxia consputa LeConte

Stations 4, 6, and general area; 18 July to 29 August; sweeping Chna.

Monoxia debilis LeConte

General area; 11 August to 21 August; sweeping Chna.

Monoxia species

General area; 10 July; sweeping mixed shrubs.

Luperodes nigrovirescens Fall

Station 3 and general area; 20 June to 28 July; on flowers of Basa, Crac, and Luca.

Pseudoluperus longulus LeConte

Stations 1 and 3, general area; 13 June to 5 July; on Basa, Cica, Hela, sweeping Meof, on foliage of Ptte.

Disonycha latifrons Schaeffer

Station 4 and general area; 12 June to 13 September; on flowers of Chna and Chvi.

Altica prasina LeConte

Grassy Cone; 17 June; on flowers of Prvi.

Epithrix subcrinata LeConte

Station 2; 25 July; sweeping Psgl.

Phyllotreta albionica LeConte

Stations 6, 10, 11, and general area; 7 July to 13 September; on flowers of Acla, sweeping Artr, on Chmi, Chna, Jusc, SALI, Sese, sweeping mixed meadow grasses.

Glyptina atriventris Horn

Station 1 and general area; 27 August to 13 September; on Chna.

Dibolia borealis Chevrolat

Station 10; 26 July; on flowers of Chmi.

Anisostena californica Van Dyke

General area; 7 July; sweeping mixed grasses.

Family Bruchidae

Acanthoscelides pauperculus LeConte

General area; 22 June to 13 September; on Basa and Chna.

Family Curculionidae

The order of genera in this family follows Kissinger (1964).

Brachyrhinus ovatus (Linnaeus)

Station 6, 12, and general area; 24 June to 5 September; sweeping Chna, on ground and under rocks.

Sitona cylindricollis Fahraeus

General area; 5 July; sweeping flowering Meof.

Scythropus elegans (Couper)

Grassy Cone and general area; 12 June to 22 June; on foliage of Pifl and Psgl.

One pair was found in copulation on the foliage of Pifl on 17 June.

Acmaegenius granicollis Van Dyke

Station 11; 14 July; in ground.

One specimen was dug from a nest of the sphecid wasp Eucerceris flavocincta Cresson.

Cleonus species near basalis Fall

General area; 31 July; on ground.

Pissodes similis Hopkins

General area; 25 July; sweeping Psgl.

Smicronyx species

Station 11; 31 August; sweeping Artr.

Phyllotrox nubifer LeConte

Grassy Cone; 17 June; in flowers of Seca.

Apion species A

General area; 24 June; on foliage of Ptte.

Apion species B

General area; 28 August; on ERIO.

Apion species C

General area; 28 August; on ERIO.

Auletobius (Auletobius) congruus (Walker)

Station 2; 14 June; on flowers of POTE.

One pair was found in copulation on the flowers of POTE on 14 June.

Rhynchites bicolor wickhami Cockerell

General area; 27 June to 3 July; on Cost and Rowo.

One pair was found in copulation on the flowers of Rowo on 3 July.

Myrmex lineata lineata (Pascoe)

Station 11; 9 July; sweeping Chna.

Magdalis lecontei Horn subspecies ?

Station 5 and general area; 13 June to 21 July; sweeping Meof, on foliage of Pifl.

Tachypterellus consors Dietz

General area; 13 June; sweeping foliage of Prvi.

Anthonomus ochreopilosus Dietz

Station 2 and general area; 31 August to 12 September; sweeping Chna, on foliage of Psgl.

Epimechus mimicus Dietz

Station 12; 14 August; sweeping plant foliage.

Rhynchaenus parvicollis LeConte

Station 1; 27 August; sweeping streamside vegetation.

Tychius lineellus LeConte subspecies ?

Station 11; 16 July; Malaise trap.

Tychius tectus LeConte

Station 11; 9 July; sweeping Artr.

Gymnaetron teter Fabricius

Station 12 and general area; 3 July to 17 July; found on Veth exclusively.

Cylindrocopturus adspersus (LeConte)

General area; 15 July; on ground.

Orthoris species near crotchi LeConte

Station 3; 25 August to 8 September; on Mela.

Many specimens of an unidentified Curculionidae larva found in the roots, stems, and seed pods of Mela may well be this species.

Family Scolytidae

Dendroctonus valens LeConte

Station 4 and 5; 22 June to 3 July; on bark of dead Pifl, on ground.

Carphoborus species

General area; 14 April; on dead Pifl.

Several specimens were collected from under the loose bark of small twigs of a recently killed Pifl.

Pitogenes carinulatus (LeConte)

General area; 14 April; on dead Pifl.

Many specimens were collected from under the loose bark of small (5-10 cm diameter) limbs of a Pifl recently killed by chemicals.

Orthothomicus latidens (LeConte)

General area; 14 April to 5 September; reared from dead Pifl.

ORDER STREPSIPTERA

Family Stylopidae

Pseudoxenos species

Station 12; 13 August; Malaise trap.

A male puparium of this species was found in the abdomen of Ancistrocerus catskill catskill (Saussure) (Vespidae).

ORDER TRICHOPTERA

Family Rhyacophilidae

Rhyacophila vao Milne

Station 4 and 12; 6 July to 12 August; attracted to black light trap, Malaise trap.

Family Glossosomatidae

Anagapetus debilis Ross

Station 12 and general area; 14 July to 15 July; sweeping streamside vegetation, attracted to black light trap.

Family Hydropsychidae

Parapsyche almota Ross

Station 4; 5 July; attracted to black light trap.

Hydropsyche occidentalis Banks

Station 4; 5 July; attracted to black light trap.

Family Limniphilidae

Hesperophylax incisus ? Banks

Station 3 and general area; 27 June to 12 September; attracted to white light, Malaise trap.

Limnephilus frijole Ross

Station 4, 8, and 12; 5 July to 28 July; attracted to black light trap, Malaise trap.

Chyranda centralis (Banks)

Station 12; 20 June to 19 August; sweeping streamside vegetation, attracted to white light, Malaise trap.

Family Lepidostomatidae

Lepidostomata roafi (Milne)

Station 12 and general area; 20 July to 12 August; attracted to black light trap, Malaise trap.

ORDER LEPIDOPTERA

SUBORDER RHOPALOCERA

The recent synonymic list of dos Passos (1964) was used to place the families, genera, and species into proper order, and was checked by Jon H. Shepard, Stanford University.

Family Hesperiidae

Ochlodes sylvanoides sylvanoides (Boisduval)

Station 12 and general area; 11 August to 23 August; on flowers of Chna, Malaise trap.

Polites draco (Edwards)

Station 12; 20 June; in flight.

Hesperia harpalus harpalus (Edwards)

Station 12 and general area; 19 June to 22 August; on flowers of Chna and Chvi, Malaise trap.

Heliopetes ericetorum (Boisduval)

Station 12; 20 June; in flight.

Erynnis icelus ? (Scudder and Burgess)

Station 12; 20 June; in flight.

Family Papilionidae

Parnassius clodius Menetries subspecies ?

Station 1 and 12; 19 June to 10 August; on Acla, in flight.

One adult was found dead on the leaves of Acla on 10 August.

Papilio indra indra Reakirt

General area; 2 July; in flight.

Papilio rutulus rutulus Lucas

Station 12; 20 June; in flight.

Papilio multicaudata Kirby

Station 2, 12, and general area; 14 June to 2 July; on flowers of PENS, in flight.

Family Pieridae

Pieris beckerii beckerii Edwards

Station 12 and general area; 20 June to 14 August; on flowers of Sese, in flight.

Pieris napi (Linnaeus)

Station 12; 20 June; in flight.

Pieris protodice occidentalis Reakirt

General area; 14 August; on flowers of Cica.

Pieris rapae (Linnaeus)

Station 12; 19 June; in flight.

Colias (Colias) eurytheme Boisduval subspecies ?

General area; 14 August to 3 October; on Chna, Cica.

Colias (Colias) alexandra edwardsii Edwards

Station 12 and general area; 20 June to 14 August; on flowers of Cica and Sese, in flight.

Anthocaris (Anthocaris) sara Lucas subspecies ?

Station 12; 20 June to 5 July; in flight.

Euchloe ausonides ausonides Lucas

Station 12; 20 June; in flight.

Family Lycaenidae

Callipsyche behrii (Edwards) subspecies ?

General area; 27 July to 2 August; on flowers of Chmi, Chna, and Chvi.

Satyrium fuliginosum fuliginosum (Edwards)

Station 12; 10 August; in flight.

Strymon titus titus (Fabricius)

General area; 14 August; on flowers of Chna.

Strymon californica (Edwards)

Station 11 and 12; 14 July to 14 August; on dead limb of Artr, on flowers of Erum and Sese.

Lycaena heteronea heteronea Boisduval

General area; 2 August; on flowers of Chvi.

Lycaena rubidus rubidus (Behr)

Station 12 and general area; 15 July to 14 August; on flowers of Sese, in flight.

Lycaena helloides (Boisduval)

General area; 20 June to 27 June; on flowers of Wyam.

Plebejus (Icaricia) icariodes (Boisduval) subspecies ?

Station 12; 15 June to 25 July; in flight.

Plebejus (Icaricia) acmon lutzi dos Passos

Station 2; 13 June; in flight.

Philotus battoides (Behr) subspecies ?

Station 1, 6, 8, 11, 12, and general area; 15 June to 30 July; on flowers of Erov, on foliage of Pifl, in flight.

Two specimens were observed as prey of Cyrtopogon inversus Curran (Asilidae) on 10 July and 15 July. Both butterflies were immobile and the wings were pointed down. There was a small puncture on the right dorsal side of the thorax just in front of the tegula.

Scolitantides piasus piasus (Boisduval)

Station 12; 20 June to 5 July; in flight, on moist ground.

Glaucopsyche lygdamus (Doubleday) subspecies ?

Station 12; 20 June; in flight.

Family Nymphalidae

Limenitis (Limenitis) weidemeyerii weidemeyerii Edwards

General area; 20 June to 22 July; in flight.

This was the only butterfly that was found commonly in the southern portion of the Monument.

Vanessa cardui (Linnaeus)

Station 12; 15 June to 27 July; in flight.

Nymphalis californica (Boisduval)

General area; 20 July; in flight.

Nymphalis milberti furcillata (Say)

Station 1 and 12; 19 June to 8 August; on Urly, in flight.

There were heavy concentrations of larvae feeding on Urly at station 1. No pupae were found in the natural environment although several larvae were reared to adults in small, outdoor screened cages. Under this condition, pupation took place on the sides of the cages.

Nymphalis antiopa (Linnaeus)

Station 12 and general area; 20 June to 17 August; on flowers of Sese, in flight.

SALI plants north of the Visitors Center and Residential area were severely defoliated by the larvae of this species during early summer, 1965. Pupae were first found on the lower branches on 27 July.

Polygonia zephyrus (Edwards)

General area; 27 July to 8 August; in flight.

Phyciodes (Phyciodes) campestris (Behr) subspecies ?

Station 12; 20 June to 10 July; in flight.

Euphydryas anicia (Doubleday) subspecies ?

Station 2, 3, 12, and general area; 13 June to 12 September; on flowers of Basa.and Chna, in flight.

This species exhibited a preference for visiting the flowers of Basa. Pupae were collected from under

rocks, logs, and eaves of buildings. One dead specimen was found as prey of Formica (Formica) rasilis Wheeler (Formicidae).

Speyeria (Speyeria) coronis near snyderi (Skinner)

General area; 19 June; on moist ground.

Speyeria (Speyeria) coronis gunderi (J. A. Comstock)

General area; 25 July; in flight.

Speyeria (Speyeria) coronis (Behr) subspecies ?

General area; 24 June; in flight.

Speyeria zerene near garretti (Gunder)

General area; 24 June; in flight.

Speyeria zerene platina (Skinner)

General area; 28 July; in flight.

Speyeria zerene cynna dos Passos and Grey

General area; 28 August; in flight.

Speyeria callippe near nevadensis (Edwards)

General area; 27 June to 22 August; on flowers of Chna, Chvi, Erov, and Sese, Malaise trap.

Speyeria callippe harmonia dos Passos and Grey

General area; 28 July; in flight.

Family Danaidae

Danaus (Danaus) plexippus (Linnaeus)

General area; 26 August to 6 September; on dead branches of Artr, in flight.

Family Satyridae

Coenonympha species

Station 12 and general area; 19 June to 11 August; on flowers of Sese, in flight.

Cercyonis oetus oetus (Boisduval)

Station 4, 11, and general area; 13 July to 14 August; on flowers of Chvi, in flight, Malaise trap.

Erebia episodea hopfingeri Ehrlich

Station 12; 20 June to 10 July; in flight.

SUBORDER HETEROCERA

Family and genera placement follow the order of the checklist of McDunnough (1938, 1939).

Family Sphingidae

Sphinx perelegans vancouverensis Hy. Edwards

Station 12 and general area; 7 July to 28 July; attracted to black light trap, attracted to white light.

Smerinthus cerisyi Kirby

General area; 24 July; at rest on building.

Smerinthus geminatus Say

General area; 27 June to 8 July; attracted to white light.

Pachysphinx modesta Harris

Station 4, 12, and general area; 22 June to 26 July; attracted to black light trap, white light.

Hemaris diffinis reubens Hy. Edwards

Station 12; 15 July; on Sese.

One male was found as prey of the spider Misumena vatia (Clerck) (Thomisidae) while visiting the flowers of Sese.

Propserpinus clarkiae Boisduval

General area; 15 July; in flight.

Celerio lineata Fabricius

General area; 22 June to 8 August; attracted to white light.

Many larvae were observed feeding on Ganu at station 6. They fed on blossoms and foliage, and would leave only the central stem intact. Under caged conditions a larva consumed the equivalent of one plant per day.

Family Saturniidae

Platysamia gloveri Strecker

General area; 14 June to 1 July; attracted to white light.

Pseudohazis eglanterina nuttalli Strecker

General area; 20 August to 29 August; on flowers of Chna, attracted to white light.

Family Arctiidae

Apantesis species

Station 4; 5 July to 14 July; attracted to black light trap.

Callarctia nevadensis (Grote and Robinson)

Visitors Center and Residential area; 13 September; attracted to white light.

Platyprepia guttata Boisduval

General area; 8 July; in flight.

Family Noctuidae

Acronita americana eldora Smith

Station 4, 12, and general area; 24 June to 28 July; attracted to black light trap.

Acronita strigulata Smith

Station 4; 14 July; attracted to black light trap.

Euxoa atropulverea Smith

General area; 28 July; attracted to black light trap.

Euxoa choris Harvey

Station 12 and general area; 28 July to 8 August; attracted black light trap, attracted to white light.

Euxoa costata idahoensis Grote

Station 4; 5 July; attracted to black light trap.

Euxoa laetificans Smith

Station 4; 8 August; attracted to white light.

Euxoa messoria Harris

Station 12 and Visitors Center; 11 August to 9 September; attracted to white light, Malaise trap.

Euxoa mimallonis gagates Grote

General area; 13 September; attracted to white light.

Euxoa nostra Smith

Station 4; 5 July to 17 July; attracted to white light.

Euxoa ochrogaster form insignata Walker

Station 6; 21 July; attracted to black light trap.

Euxoa olivalis Grote

Station 12; 28 July; attracted to black light trap.

Euxoa plagigera Morrison

Station 4 and Visitors Center; 17 July to 21 July; attracted to white light.

Euxoa pleuriticoides Benjamin

Station 4; 28 July; attracted to black light trap.

Euxoa pluralis Grote

Station 4 and Visitors center; attracted to black light trap, attracted to white light.

Euxoa punctigera strofusca Smith

Station 12; 28 July; attracted to black light trap.

Euxoa septentrionalis Walker

Station 4; 5 July; attracted to black light trap.

Euxoa tessellata Harris

Station 4; 21 July; attracted to black light trap.

Euxoa species near setonia McDunnough

Station 6; 21 July; attracted to black light trap.

Euxoa species A

Station 12 and general area; 17 July to 8 August; attracted to black light trap, attracted to white light.

Euxoa species B

Station 11; 15 July; on ground.

Chorizagrotis auxiliaris Grote

General area; 13 September; attracted to white light.

Copablepharon canariana McDunnough

General area; 25 July; on foliage of Artr.

Protogygia enalaga McDunnough

Station 4; 21 July; attracted to black light trap.

Spaelotis havilae Grote

Station 4, 6, 9, and general area; 21 June to 17 September; Berlese flowers of Chna, attracted to black light trap, attracted to white light.

Setagrotis cinereicollis Grote

Station 12; 28 July; attracted to black light trap.

Abagrotis barnesi Benjamin

Station 4; 21 July; attracted to black light trap.

Abagrotis duanca Smith

Station 4 and 11; 5 July to 15 July; attracted to black light trap, on ground.

Abagrotis forbesi ? Benjamin

Station 4 and 12; 21 July to 28 July; attracted to black light trap.

Abagrotis vittifrons Grote

Station 4; 21 July; attracted to black light trap.

Rhynchagrotis exsertistigma Morrison

Station 4 and 11; 5 July to 21 July; attracted to black light trap, on ground.

Ufeus hulsti Smith

Visitors Center; 5 September; attracted to white light.

Trichoclea u-scripta Smith

Station 4, 9, and general area; 14 June to 21 July; attracted to black light trap, attracted to white light, Malaise trap.

Lacinipolia olivacea Morrison

Station 12; 28 July; attracted to black light trap.

Lacinipolia stricta tenisca Smith

Visitors Center; 8 September; attracted to white light.

Lacinipolia species

Station 4 and general area; 14 July to 9 September; attracted to black light trap, attracted to white light.

Orthodes communis Dyar

General area; 21 July; attracted to black light trap.

Dargida procincta Grote

General area; 21 July; attracted to black light trap.

Cuculla montanae Grote

Station 4; 5 July to 21 July; attracted to black light trap.

Oncocnemis chorda Grote

Station 3; 8 August; Malaise trap.

Pseudanarta caeca ? Dodds

Station 4; 14 July; attracted to black light trap.

Pseudanarta crocea Hy. Edwards

Station 7; 14 August; attracted to black light trap.

Septis occidens Grote

General area; 17 July; attracted to white light.

Agroperina lateritis Hubner

General area; 3 August; attracted to black light trap.

Aseptis characta Grote

Station 6 and 12; 21 July to 28 July; attracted to black light trap.

Aseptis fumosa Grote

Station 4 and 12; 21 July to 28 July; attracted to black light trap.

Aseptis paviae Strecker

Station 6 and 12; 21 July to 28 July; attracted to black light trap.

Apamea amputatrix Fitch

Station 4; 5 July; attracted to black light trap.

Apamea occidens Grote

Station 4, 9, and 12; 19 June to 28 July; attracted to black light trap, Malaise trap.

Draudtia lunata Barnes and McDunnough

General area; 17 July; attracted to white light.

Platyperigea extima Walker

Station 4 and general area; 21 July to 5 September; attracted to black light trap, attracted to white light.

Platyperigea species probably camina Smith

Station 12; 14 August; sweeping streamside vegetation.

Enargia decolor form infumata Grote

Station 12; 28 July; attracted to black light trap, attracted to white light.

Zotheca tranquilla form viridula Grote

Station 12; 28 July; attracted to black light trap.

Schinia albafascia Smith

General area; 25 July; on dead branch of Artr.

Schinia separata Grote

General area; 8 August; attracted to white light.

Autographa californica Speyer

Station 4 and general area; 21 July to 21 August; attracted to black light trap, attracted to white light, Malaise trap.

Catocala arizonae ? Grote

Visitors Center; 16 August; on south-facing window.

Synedoida howlandi Grote

General area; 18 June to 22 June; attracted to white light, in flight.

Synedoida nichollae Hampson

Station 4; 5 July to 14 July; attracted to black light trap.

Synedoida tejonica Behr

General area; 17 July; attracted to black light trap.

Scoliopteryx libatrix Linnaeus

Visitors Center; 26 August; on inside wall.

Hypena humuli Harris

General area; 8 August; in flight.

Camptylochila lubricalis Geyer

Station 4; 14 July; attracted to black light trap.

Family Pericopidae

Gnophaela latipennis discreta Stretch

Station 1, 4, and 12; 21 July to 10 August; on flowers of Ruoc and Sese.

Family Liparidae

Hemerocampa pseudotsugata McDunnough

Station 2; May; larvae on foliage of Psgl.

Several larvae were observed on the foliage of Psgl by Lowell Farmer, U.S.F.S., Ogden, Utah. (Memo in Craters of the Moon National Monument files).

Family Lasiocampidae

Malacosoma californica (Packard)

Station 4, 6, 12, and general area; 20 June to 17 July; larvae on Prvi, Putr, and Rice, adults attracted to black light trap, attracted to white light.

Family Geometridae

Chlorosea nevadaria Packard

Station 4, 11, and general area; 18 July to 25 July; attracted to black light trap, Malaise trap.

Eupithecia species

General area; 20 August; attracted to white light.

Dysstroma citrata Linnaeus

Station 4; 5 July; attracted to black light trap.

Dysstroma formosa Hulst

Station 4; 5 July; attracted to black light trap.

Marmopteryx marmorata Packard

Station 9 and general area; 14 June to 11 July; attracted to white light, Malaise trap.

Entephria multivaga Hulst

General area; 8 August; attracted to white light.

Semiothisa curvata Grote

Station 4; 14 July; attracted to black light trap.

Semiothisa neptaria Guenee

Station 12; 28 July; attracted to black light trap.

Itame colata Grote

Station 4 and Visitors Center and Residential area; 5 July to 13 September; attracted to black light trap, attracted to white light.

Elpiste lorquinaria Guenee

Station 12; 11 August; Malaise trap.

Hesperumia sulphuraria Packard

Station 4, 6, and 12; 21 July to 10 August; on foliage of Putr, attracted to black light trap, attracted to white light.

Glena nigricaria Barnes and McDunnough

Station 4 and 9; 21 June to 21 July; attracted to black light trap, attracted to white light, Malaise trap.

Caripeta aequaliaria Grote

Station 4 and general area; 22 July to 25 July; on cinder.

Neoterpes trianguliferata (Packard)

Station 3; 26 June; on foliage of Basa.

Sicya macularia Harris

Station 12; 28 July; attracted to white light.

Family Pyralidae

Loxostege species

General area; 30 August; attracted to black light trap.

Pyrausta fodinalis Lederer

Station 12; 28 July; attracted to black light trap.

Pyrausta fumoferalis Hulst

Station 12; 28 July; attracted to white light.

Pyrausta semirubralis Packard

General area; 10 August; on foliage of Putr.

Family Phycitidae

Myelopsis species

General area; 20 August to 9 September; attracted to black light trap, attracted to white light.

Family Crambidae

Crambus bonifatellus (Hulst)

General area; 25 June; in flight.

Crambus race between ruricolellus Zeller and plumbifimbriellus Dyar

Visitors Center and Residential area; 9 September; attracted to white light.

Crambus species

General area; 28 July to 13 September; attracted to black light trap, attracted to white light.

Family Orneodidae

Orneodes species

General area; 15 August to 29 August; in flight.

Family Pterophoridae

Oidaematophorus grisescens Walsingham

General area; 21 July to 24 August; on foliage of Putr, in flight.

Family Olethreutidae

Eucosma ridingsana (Robinson)

Visitors Center and Residential area; 30 August; attracted to black light trap.

Eucosma species

General area; 28 July; attracted to black light trap.

Family Tortricidae

Sparganothis tunicana (Walsingham)

Visitors Center and Residential area; 28 July; attracted to black light trap.

Choristoneura species possibly fumiferana (Clemens)

General area; 25 July; on foliage of Psgl.

Family Cossidae

Genus ? species ?

Station 12; 28 July; attracted to black light trap.

Family Gelechiidae

Lita species

Visitors Center and Residential area; 13 September; attracted to white light.

Aroga websteri Clarke

Visitors Center and Residential area; 28 July; attracted to black light trap.

Chionodes species

General area; 11 August; sweeping Putr.

Filatima species

Visitors Center and Residential area; 30 August; attracted to black light trap.

Chrysopora species nova

General area; 11 August; sweeping Chvi.

Gnorimoschema ? species A

General area; 28 July; attracted to white light.

Gnorimoschema ? species B

Station 12; 1 August; on foliage of Hela.

Family Oecophoridae

Agonopterix species

General area; 10 August; sweeping Putr.

Family Ethmiidae

Ethmia albistrigella (Walsingham)

Station 3; 26 June; on foliage of Basa.

Ethmia monticola (Walsingham)

Visitors Center and Residential area; 22 June; sweeping Cost.

Family Aegeriidae

Ramosia fragariae (Hy. Edwards)

General area; 30 June to 5 July; on flowers of Acla, on pahoehoe lava.

Family Lyonetiidae

Bucculatrix species probably tridenticola Braun

General area; 10 July to 25 July; on Chna and Psgl.

Genus ? species ?

General area; July; reared from dead Pifl.

ORDER DIPTERA

This order is arranged following the catalog of Stone et al (1965).

SUBORDER NEMATOCERA

Family Tipulidae

Nephrotoma ferruginea ferruginea (Fabricius)

Station 11; 19 July; Malaise trap.

Tipula (Bellardina) umbra Alexander

Station 12; 12 August; Malaise trap.

Tipula (Platytipula) spenceriana hardyi Alexander

General area; 9 September; attracted to white light.

Tipula (Oreomyza) fallax Loew

General area; 15 July; in flight.

Tipula (Oreomyza) species near alcestis Alexander

General area; 3 July; in flight.

Tipula (Lunatipula) bisetosa bisetosa Doane

Station 12; 28 July to 12 August; in flight, Malaise trap.

Tipula (Lunatipula) dorsimacula dorsimacula Walker

Station 2; 21 July; Malaise trap.

Tipula (Lunatipula) lamellata Doane

Station 6 and 11; 27 June to 19 July; in flight, Malaise trap.

Tipula (Lunatipula) pellucida Doane

Station 1, 4, 6, and general area; 20 June to 15 July; on Prvi, attracted to black light trap.

Tipula (Pterelachisus) horningi species nova ms Alexander

General area; 30 June to 17 July; in flight.

Tipula species

Station 4; 14 July; attracted to black light trap.

Limonia (Geranomyia) canadensis (Westwood)

General area; 26 August; sweeping Chna.

Limonia (Dicranomyia) citrina (Doane)

Station 2; 22 June; sweeping Psgl.

Limonia (Dicranomyia) venusta (Bergroth)

General area; 5 July; in flight.

Dactylolabis (Dactylolabis) species

Station 1; 14 June; sweeping Elco.

Erioptera (Symplecta) cana (Walker)

General area; 14 June; sweeping Pifl.

Ormosia (Rhypholophus) bifidaria Alexander

General area; 20 June; in flight.

Family Psychodidae

Pericoma (Pericoma) californica Kincaid

Station 12; 14 June; sweeping Rupa and Urly near stream edge.

Family Culicidae

Aedes (Ochlerotatus) dorsalis (Meigen)

Station 6; 4 September; attracted to man.

Aedes (Ochlerotatus) nigromaculis (Ludlow)

General area; 10 August; biting man.

Aedes (Ochlerotatus) schizopinax Dyar

General area; 18 June; on Pifl.

Culiseta (Culiseta) inornata (Williston)

Station 2, 9, 12, and general area; 17 June to 24 August; attracted to black light trap, attracted to man, Malaise trap.

Culex (Culex) tarsalis Coquillett

Station 2, 12, and general area; 23 July to 7 September; attracted to white light, Malaise trap.

Family Chironomidae

Cricotopus species

Station 1; 23 June; sweeping blooming unidentified Umbelliferae.

Chironomus (Chironomus) species

Station 12; 29 June; in flight.

Family Simulidae

Simulium (Psilozia) vittatum Zetterstedt

Station 4; 23 June to 12 July; attracted to white light.

Family Bibionidae

Bibio albipennis albipennis Say

Station 3 and general area; 13 June to 24 June; on foliage of Basa, Chna, Cost, Elco, Pifl, Ptte, and Urly.

Bibio vestitus Walker

Station 1 and 12; 22 June to 23 June; sweeping Prvi and unidentified Umbelliferae.

Bibiodes aestivus Melander

General area; 2 July to 7 July; sweeping Psgl.

Dilophus proximus McAtee

Station 1; 23 June; sweeping unidentified Umbelliferae.

Family Mycetophilidae

Allodia species A

Station 12; 14 June; sweeping Urly.

Allodia species B

Station 9; 17 June; Malaise trap.

Megalopelma species

Station 9; 17 June; Malaise trap.

Leia joculator Laffon

Station 1; 23 June; sweeping unidentified Umbelliferae.

Family Siaridae

Bradysia species

Station 9; 17 June; Malaise trap.

Family Scatopsidae

Genus ? species ?

Station 12; 18 July; on flowers of Sese.

Family Cecidomyiidae

Genus ? species ?

General area; 1 August; sweeping mixed shrubs.

SUBORDER BRACHYCERA

Family Stratiomyidae

Adoxomyia rustica (Osten Sacken)

General area; 17 June; on ground.

Euparyphus (Aochletus) cinctus (Osten Sacken)

General area; 30 July; in flight.

Odontomyia (Odontomyiina) virgo (Wiedemann)

General area; 18 July; on flowers of Acla.

Family Tabanidae

Silvius (Silvius) gigantulus (Loew)

Station 1 and 12; 19 June to 18 July; on flowers of Hela, in flight.

Chrysops (Chrysops) mitis Osten Sacken

Grassy Cone; 3 July; in flight.

Chrysops (Chrysops) noctifer pertinax Williston

Station 12 and general area; 17 June to 18 July; on Pifl, attracted to man, on moist ground.

Hybomitra tetrica (Marten)

Station 8 and 12; 3 July to 7 July; Malaise trap.

Hybomitra tetrica variety hirtula (Bigot)

General area; 16 July; in flight.

Family Rhagionidae

Symphoromyia inurbana Aldrich

Station 1, 11, and general area; 20 June to 9 July; on Psgl and unidentified Umbelliferae.

Family Therevidae

Psilocephala aldrichii Coquillett

Station 2 and 3; 16 July to 27 July; Malaise trap.

Psilocephala costalis Loew

Station 2, 3, 11, and 12; 11 June to 8 September; on stem of Mela, Malaise trap.

One specimen was taken from a rearing of Mela which was heavily infested with Curculionidae larvae.

Psilocephala limata Coquillett

Station 2; 25 July; Malaise trap.

Psilocephala montivaga Coquillett

Station 2; 25 July; Malaise trap.

Psilocephala species nova A

General area; 18 June; in flight.

Psilocephala species nova B

Grassy Cone; 17 June; sweeping flowering Prvi.

Psilocephala species nova C

General area; 21 August to 12 September; on flowers of Chna, in flight.

Metaphragma planiceps (Loew)

Station 1; 23 June; sweeping unidentified Umbelliferae.

Thereva furcata Loew

Station 12 and general area; 20 July to 13 September; on flowers of Chvi and XANT, attracted to black light trap.

Therva neomexicana Cole

Station 11, 12, and general area; 20 June to 20 July; on Cica, Sese, and XANT, Malaise trap.

One specimen was found prey to the spider Misumena vatia (Clerck) (Thomisidae) while visiting the flowers of Sese.

Thereva pseudoculata Cole

Station 2, 11, and general area; 24 June to 25 July; on Artr, Chna, and Cost, Malaise trap.

Thereva species nova A

General area; 7 July to 18 July; on flowers of Cica, in flight.

Thereva species nova B

General area; 3 July to 12 September; on flowers of Chna and Rowo.

Family Scenopinidae

Genus ? species ?

General area; 23 June to 19 July; on Pifl, attracted to white light.

Family Asilidae

Apachekolos confusio Martin

Station 2, 11, and general area; 7 July to 17 July; sweeping Chna, Malaise trap.

Leptogaster fornicata Martin

Station 11; 16 July; Malaise trap.

Leptogaster nitoris Martin

Station 12; 11 August to 13 August; Malaise trap.

Cophura brevicornis (Williston)

Station 6 and general area; 14 July to 21 July; sweeping foliage of Artr and Pifl.

Cyrtopogon banksi Wilcox and Martin

Station 11, 12, and general area; 20 June to 21 July; on flowers of Hela and Sese.

Cyrtopogon glarealis Melander

Station 2, 12, Grassy Cone, and general area; 17 June to 25 July; sweeping Basa, on flowers of Cica, on foliage of SALI, Malaise trap.

Cyrtopogon inversus Curran

Station 12 and general area; 21 June to 15 July; in flight.

Two specimens were captured with prey, Formica species (Formicidae) (a winged male), and Philotus battoides (Behr) subspecies ? (Lycaenidae).

Dicolonus sparsipilosum Back

General area; 15 July; in flight.

Holopogon (Holopogon) seniculus Loew

Station 11; 12 July; on pahoehoe lava.

Ospriocerus abdominalis (Say)

General area; 2 August; in flight.

Stenopogon inquinatus Loew

Station 11; 14 July; on dead branch of Artr, in flight, on ground.

One specimen was captured with prey, Chlorochroa uhleri Stal (Pentatomidae). The right hemielytron and hindwing were badly disturbed on the bug, indicating a small feeding puncture at the base of the right wing.

Stenopogon martini Bromley

Station 12 and general area; 19 June to 11 August; sweeping Prvi and Sese, Malaise trap.

Stenopogon neglectus Bromley

General area; 27 August; on ground.

Willistonia bilineata nigrofemorata Wilcox

Station 12; 11 August; Malaise trap.

Laphria fernaldi (Back)

Station 12; 20 June to 14 August; on Hela, Potr, Prvi, and Urly, Malaise trap.

Pogonosoma ridingsi Cresson

Station 6; 8 July to 17 July; on foliage of Pifl.

Asilus albicomus Hine

Station 2 and 12; 10 August; Malaise trap, in flight.

Asilus auriannulatus (Hine)

Station 12; 20 June to 7 July; sweeping Elco and Prvi.

Asilus species

Station 11; 17 July to 19 July; Malaise trap.

Efferia benedicti (Bromley)

Station 2 and 11; 9 July to 15 July; on rocks.

One specimen was captured with prey, Tortistilus wickhami Van Duzee (Membracidae).

Efferia frewingi Wilcox

Station 10; 4 September to 8 September; on pahoehoe lava.

The specimens definitelly had a preference for resting on broken pahoehoe lava. Three individuals were captured with prey, an unidentified Muscidae, Ravinia lherminieri (Robineau-Desvoidy)(Sarcophagidae), and Eupeodes volcris Osten Sacken (Syrphidae). Each of the prey had a puncture at the left side of the abdomen near the thorax and their heads were turned 90° left or right.

Efferia pallidula (Hine)

General area; 13 July; in flight.

Efferia zonata ? (Hine)

Station 3; 27 July; Malaise trap.

Machimus occidentalis (Hine)

Station 11 and 12; 5 July to 19 August; on Artr and Phle, Malaise trap.

Mallophorina martimorum Cole

Station 4 and general area; 2 August to 4 September; sweeping foliage of Chmi, Chna, and Chvi, on rocks.

Negasilus belli Curran

Station 11 and general area; 9 July to 15 July; sweeping plant foliage.

Family Acroceridae

Eulonchus species near sapphirinus Osten Sacken

Station 1; 18 July; on flowers of Acla.

Acrocera melanderi Cole

Station 11; 14 July; sweeping flowers of Erum.

Family Bombyliidae

Bombylius cinerivus Painter

Station 1, 2, and general area; 13 June to 20 June; on flowers of POTE, in flight.

Bombilius facialis ? Cresson

General area; 20 June to 2 August; on flowers of Chdo and Chna.

Systoechnus oreas Osten Sacken

Station 1 and general area; 20 June to 10 July; on flowers of POTE, on ground.

Anastoechus barbatus Osten Sacken

General area; 10 August to 8 September; on Chna and Chvi.

Anastoechus species

General area; 6 September; on Chna.

Heterostylum (Heterostylum) robustum (Osten Sacken)

Station 4; 9 July; in flight.

Lordatus gibbus striatus Painter

Sunset Cone; 12 September; on flowers of Chna.

Conophorus fallax (Greene)

General area; 20 June; on ground.

Conophorus fenestratus (Osten Sacken)

Station 12; 15 June to 5 July; on Elco, in flight.

Conophorus obesulus (Loew)

Station 12; 19 June; in flight.

Pantabarbes capito Osten Sacken

Station 1 and 11; 20 June to 14 July; in flight.

Mythicomyia species

General area; 2 August; sweeping Chmi.

Oligodranes species

General area; 29 August; on Chna.

Geron species A

General area; 11 August; on Asca, Chmi, and Chna.

Geron species B

General area; 11 August to 17 August; on Asca and Chna.

Geron species C

General area; 16 August to 30 August; on Chna and Ruoc.

Toxophora virgata Osten Sacken

Station 6 and general area; 16 July to 25 August; on Acla, Chmi, Chna, and Erum.

Eclimus muricatus (Osten Sacken)

Station 4, 7, and general area; 3 July to 8 July; on flowers of Erum and Phle.

Eclimus species

Station 1, 7, and general area; 3 July to 15 August; on flowers of Acla and Cica.

Aphoebantus mormon ? Melander

Station 11; 31 August; in flight.

Aphoebantus species

Station 1, 2, and general area; 20 June to 14 July; in flight.

Anthrax albofasciatus cascadensis Marston

Station 9 and 12; 20 June to 14 July; in flight.

Anthrax argentatus (Cole)

Station 7, 8, and 11; 3 July to 16 July; in flight.

Anthrax irroratus Say

Station 1, 2, 8, 9, 10, 11, 12, and general area; 20 June to 13 August; on flowers of Hela, Phle, Malaise trap, in stick traps.

An immature larva of this species was found in a cell of a stick trap associated with Hylaeus species (Colletidae) at station 10, and in a cell of a stick trap parasitizing a specimen of Hoplitis (Alcidamea) producta producta (Cresson) (Megachilidae) at station 9.

Anthrax plesius Curran

Station 11 and 12; 16 July to 13 August; on flowers of Hela, Malaise trap.

Villa (Villa) agrippina (Osten Sacken)

General area; 10 August; on flowers of Chna.

Villa (Villa) alternata alternata (Say)

General area; 13 July to 6 September; on flowers of Acla and Chna.

Villa (Villa) lateralis lateralis (Say)

Station 4, 6, 9, 12, and general area; 12 June to 6 September; on flowers of Acla, Chna, Erum, Hela, Phle, and Ptte, attracted to black light, Malaise trap.

Villa (Hemipenthes) catulina (Coquillett)

Station 11, 12, and general area; 16 July to 11 August; on flowers of Acla, Malaise trap.

Villa (Hemipenthes) eumenes Osten Sacken

General area; 27 June to 15 July; in flight.

Villa (Hemipenthes) morio (Linnaeus)

Station 1, 2, 3, 6, 8, 11, 12, and general area; 13 June to 13 August; on Artr, Chna, Erov, and LUPI, Malaise trap.

Villa (Thyridanthrax) fenestratoides (Coquillett)

Station 12; 20 June; on ground.

Villa (Thyridanthrax) nugator (Coquillett)

General area; 13 July to 6 September; on Chna.

Villa (Chrysanthrax) nebulosa ? (Coquillett)

Station 12; 13 August; Malaise trap.

Villa species A

Station 2, 9, and general area; 13 June to 25 July; on flowers of Erov and Phle, Malaise trap.

Villa species B

General area; 20 July; on flowers of Cica.

Villa species C

General area; 10 July; in flight.

Villa species D

Station 6, 9, and general area; 22 June to 4 September; Malaise trap.

Lepidanthrax species

Station 2, 6, and 11; 14 July to 17 July; sweeping Artr.

Poecilanthrax tegminipennis (Say)

General area; 21 August; in flight.

Poecilanthrax willistonii (Coquillett)

Station 2 and general area; 23 August to 11 September; Malaise trap, in flight.

Exoprosopa caliptera (Say)

Station 1, 2, 3, and 12; 20 June to 23 July; hovering near cinder, Malaise trap.

Exoprosopa dorcadion Osten Sacken

Station 12; 11 August; Malaise trap.

Exoprosopa eremita Osten Sacken

Station 2 and general area; 10 July to 25 July; Malaise trap.

Family Empididae

Genus ? species ?

General area; 14 June to 14 August; sweeping mixed shrubs and herbs.

Family Dolichopodidae

Dolichopus crenatus (Osten Sacken)

Station 12; 14 August; sweeping streamside vegetation.

Dolichopus obcordatus ? Aldrich

General area; 1 July to 1 August; sweeping Pifl.

Dolichopus plumipes (Scopoli)

Station 12; 1 August; sweeping streamside vegetation.

Pelastoneurus vagans Loew

General area; 30 July; in flight.

Medetera species

General area; 30 July to 1 August; sweeping Chmi.

SUBORDER CYCLORRHAPHA

Family Lonchopteridae

Lonchoptera furcata (Fallen)

General area; 6 July; on plant foliage.

Family Phoridae

Genus ? species ?

General area; 15 June to 18 July; on shrub foliage.

Family Pipunculidae

Genus ? species ?

General area; 28 June to 13 September; sweeping mixed grasses and shrubs.

Family Syrphidae

Syrphus bigelowi Curran

Station 12; 10 August; on flowers of Veth.

Syrphus currani Fluke

Grassy Cone and general area; 13 June to 17 June; sweeping Basa, Pifl, and Psgl.

Syrphus jonesi Fluke

Station 12; 6 July; sweeping Urly.

Syrphus opinator Osten Sacken

Station 3 and general area; 13 June to 27 June; sweeping Basa, Pifl, and Potr 2.

Syrphus ribesii (Linnaeus)

Station 1, 3, and 12; 18 July to 23 August; on flowers of Hela, Malaise trap.

Metasyrphus aberrantis (Curran)

Station 6; 26 June; on foliage of Pifl.

One specimen was reared from a pupa which was attached on the ventral surface of a Pifl needle.

Metasyrphus astutus Fluke

Grassy Cone; 17 June; in flight.

A large series of this species was collected at a shaded, heavily timbered habitat. Specimens were attracted to a white net held motionless in the air.

Metasyrphus lapponicus (Zetterstedt)

General area; 25 June to 1 July; sweeping plant foliage.

Metasyrphus latifasciatus (MacQuart)

Station 12; 15 July to 5 September; on Cica, in flight.

Metasyrphus lebanoensis (Fluke)

Station 12 and general area; 3 July to 13 August; on flowers of Phle, Malaise trap.

Metasyrphus snowi (Wehr)

Station 12; 5 July; on ground.

Metasyrphus venablesi (Curran)

Station 12; 11 August; Malaise trap.

Eupeodes volucris Osten Sacken

Station 2, 3, 8, 9, 10, 11, 12, and general area; 13 June to 4 September; on Basa, Chna, Erde, Erov, Erum, Liru, Phle, and POTE, Malaise trap.

A specimen was prey to the robberfly Efferia frewingi Wilcox (Asilidae) at station 10 on 4 September.

Scaeva pyrastri (Linnaeus)

Station 3, 4, 6, 12, and general area; 17 June to 24 August; on Chna, Cica, sweeping Syva, Malaise trap.

Two specimens were prey of the ambush bug, Phymata americana coloradensis Melin (Phymatidae), while visiting the flowers of Chna, at station 4.

Dasysyrphus amalopis (Osten Sacken)

Station 12 and general area; 20 June to 11 August; sweeping Cost and Prvi, Malaise trap.

Dasysyrphus creper (Snow)

General area; 13 September; in flight.

Allograpta obliqua (Say)

Station 2; 24 August; in flight.

Sphaerophoria robusta Curran

Station 3, 4, 6, 12, and general area; 11 August to 12 September; on flowers of Asca and Chna, Malaise trap, in flight.

One specimen was prey of the spider Misumena vatia (Clerck)(Thomisidae) while visiting the flowers of Chna.

Mesograpta marginata (Say)

Station 3, 4, 11, and general area; 9 July to 24 August; on Chna, Malaise trap.

Baccha (Ocyptamus) lemur Osten Sacken

Station 2, 4, 10, 11, 12, and general area; 9 July to 30 August; on Artr, Chmi, Chna, Hela, Pifl, SALI, and Sese, Malaise trap.

Melanostoma species

Station 1, 2, 9, 11, and general area; 17 June to 13 August; sweeping Basa and Erov, Malaise trap.

Carposcalis rostrata ? (Bigot)

General area; 22 June; sweeping Pifl.

Carposcalis stegna (Say)

Station 12; 30 June; on ground.

Paragus (Paragus) bicolor (Fabricius)

Station 2, 9, 11, and general area; on Acla and Hela, Malaise trap.

Paragus (Pandasyopthalmus) tibialis (Fallen)

Station 2, 4, 8, 11, and general area; 22 June to 14 July; on Erov and Pifl.

Pipiza femoralis Loew

Station 12; 11 August; Malaise trap.

Pipiza species

Station 2 and 12; 23 July to 13 August; Malaise trap.

Chrysotoxum (Primochrysotoxum) chinook Shannon

Station 11 and 12; 17 July to 11 August; Malaise trap.

Chrysotoxum (Primochrysotoxum) coloradense Greene

Station 3 and 9; 19 June to 23 August; Malaise trap.

Chrysotoxum (Primochrysotoxum) integre Williston

Station 2, 3, and 12; 23 July to 24 August; on flowers of Chvi, Malaise trap.

One specimen was prey to the spider Misumena vatia (Clerck)(Thomisidae) while visiting the flowers of Chvi, Cheilosia species

Station 1; 23 June to 5 July; on flowers of Hela, sweeping unidentified Umbelliferae.

Ferdinandea croesus (Osten Sacken)

Station 2, 11, 12, and general area; 20 June to 19 August; Malaise trap.

Eumerus strigatus (Fallen)

General area; 11 August to 20 August; on flowers of Taof, Malaise trap.

Volucella (Volucella) bomylans variety rufomaculata Jones

Station 3; 22 June; sweeping Syva.

Volucella (Volucella) satura Osten Sacken

General area; 12 July to 28 July; on Sese, in flight.

Volucella (Copestylum) caudata (Curran)

General area; 21 August; in flight.

Sericomyia chalcopyga Loew

Station 1; 27 August; in flight.

Arctophila flagrans Osten Sacken

Station 1 and 12; 11 August to 27 August; Malaise trap.

Xylota (Xylota) flavitibia Bigot

Station 12; 27 August; sweeping Potr 2.

Xylota (Xylota) lovetti Curran

Station 12; 11 August; Malaise trap.

Xylota (Xylota) micrura (Curran)

Station 2; 3 July; on flowers of POTE.

Xylota (Xylota) subfasciata Loew

Station 12; 11 August; Malaise trap.

Xylota (Xylotomima) pigra (Fabricius)

Station 9 and 12; 21 June to 13 August; Malaise trap.

Syritta pipiens (Linnaeus)

General area; 12 July to 13 September; on flowers of Chmi, Chna, Chvi, and Sese, Malaise trap.

Helophilus (Helophilus) latifrons Loew

Station 3 and 6; 23 August to 24 August; on flowers of Chna, Malaise trap.

Asemosyrphus polygrammus (Loew)

General area; 1 August to 6 September; on flowers of Chna.

Eristalis (Eristalis) arbustorum (Linnaeus)

Station 1, 3, 4, 6, 12, and general area; 13 June to 5 September; on flowers of Basa, Chna, Cica, Erde, Erov, Erum, Pifl, Prvi, and ZYGY, Malaise trap.

This species was most abundant in June and preferred flowers of several species of ERIO.

Eristalis (Eristalis) tenax (Linnaeus)

General area; 15 July; in flight.

Family Conopidae

Physoconops (Physoconops) fronto (Williston)

General area; 29 July to 8 August; on flowers of Chmi, Chvi, and Trre.

Physocephala burgessi (Williston)

General area; 18 July to 1 August; on flowers of Acla, on SALI.

One specimen was prey of the spider Misumena vatia (Clerck)(Thomisidae) while visiting the flowers of Acla.

Physocephala texana (Williston)

Station 4 and 11; 15 July to 8 August; on flowers of Chna and Erum.

Zodion americanus Weidemann

Station 11, 12, and general area; 18 July to 14 August; on flowers of Chna and Sese, Malaise trap.

Zodion cinereiventre Van Duzee

General area; 18 July; on flowers of Acla.

Zodion fulvifrons Say

Station 4, 9, and 12; 21 June to 17 August; on flowers of Chna, Chvi, and Cica, Malaise trap.

Zodion intermedium Banks

General area; 18 July; on flowers of Acla.

Thecophora luteipes (Camras)

General area; 28 July to 22 August; on flowers of Sese, attracted to black light.

Thecophora modesta (Williston)

Station 12 and general area; 27 June to 17 August; on flowers of Chna, Erov, and Wyam.

Thecophora nigripes (Camras)

Station 2, 6, and general area; 12 July to 28 July; on flowers of Acla and Crac, Malaise trap.

Thecophora occidensis (Walker)

Station 1; 27 August; sweeping streamside vegetation.

Thecophora propinqua (Adams)

Station 4, 10, 11, and general area; 12 July to 8 August; on flowers of Acla, Chmi, Chna, and Chvi, attracted to black light trap, Malaise trap.

Dalmannia picta Williston

Station 1; 5 July; sweeping flowers of Hela.

Family Psilidae

Psila (Chamaepsila) dimidiata Loew

Station 12; 14 June; on foliage of Urly, on flowers of ZYGA.

Family Tephritidae

Eutreta jonesi Curran

General area; 30 July; in flight.

Eutreta species

The many specimens of this genus collected are being studied by Richard H. Foote, U. S. National Museum, Washington, D. C.

Paracantha genalis Malloch

Station 1, 6, and 12; 28 June to 10 August; on flowers of Cica and Civu.

Paracantha gentilis Hering

General area; 28 July; sweeping plant foliage.

Oxyna palpalis (Coquillett)

Station 11; 8 July; sweeping plant foliage.

Paroxyna species

The specimens of this genus are under the study of Richard H. Foote, U. S. National Museum, Washington, D.C.

Trupanea bisetosa (Coquillett)

Station 1, 6, 11, 12, and general area; 14 June to 29 August; on Chmi, Chvi, Cica, Pifl, unidentified Umbelliferae, and Wyam, Malaise trap.

Trupanea jonesi Curran

Station 2, 3, 9, and 11; 5 July to 13 September; sweeping Artr, Chna, Elco, Meof, and Putr, Malaise trap.

Trupanea nigricornis (Coquillett)

Station 11 and general area; 7 July to 19 July; sweeping Meof, on flowers of Phle, Malaise trap.

Tephritis araneosa (Coquillett)

Station 2, 11, and general area; 19 June to 28 July; on flowers of Acla, sweeping Pifl and Psgl, Malaise trap.

Tephritis stigmatica (Coquillett)

General area; 19 July; sweeping flowering Chmi.

Neotephritis finalis (Loew)

Station 2 and general area; 22 June to 23 July; on flowers of Acla and Basa, sweeping Pifl, Malaise trap.

Euarestoides acutangulus (Thomson)

Station 1 and general area; 23 June to 9 August; sweeping Chmi and unidentified Umbelliferae.

Aciurina ferruginea (Doane)

Station 3, 6, and general area; 14 July to 24 August; sweeping Chna, Chvi, and Pifl, Malaise trap.

Aciurina maculata (Cole)

Station 4 and 12; 12 June to 20 June; on foliage of Chna.

Valentibulla munda (Coquillett)

Station 11; 11 July; Malaise trap.

Stenopa vulnerata (Loew)

General area; 15 July; in flight.

Orellia occidentalis (Snow)

Station 1, 11, 12, and general area; 23 June to 15 July; on flowers of Cica, Malaise trap.

Adult specimens were reared from larvae from the flower heads of Cica.

Rhagoletis basiola (Osten Sacken)

Station 1, 2, 3, 7, 11, and general area; 3 July to 1 September; on Erum, Malaise trap.

Family Sepsidae

Saltella sphondylii (Schrank)

General area; 18 July to 28 July; on flowers of Acla and Sese.

Family Lauxaniidae

Genus ? species ?

Station 12; 14 August; sweeping streamside vegetation.

Family Chamaemyiidae

Pseudodinia nitens (Melander and Spuler)

General area; 7 July to 28 July; sweeping flowers of Acla.

Pseudodinia baripes Coquillett

General area; 27 August; sweeping plant foliage.

Leucopis (Leucopis) species

General area; 19 July; sweeping Chmi and Pifl.

One specimen was taken from the rearings of dead Pifl.

Family Milichiidae

Madiza glabra Fallen

General area; 25 August to 30 August; sweeping Chmi.

Leptometopa latipes (Meigen)

General area; 30 August; sweeping Chna.

Family Ephydridae

Mosillus bidentatus (Cresson)

General area; 5 September; sweeping Chna.

Hydrellia species

General area; 22 June; sweeping Basa.

Paryda (Parydra) nitida Cresson

Station 12; 22 June; sweeping flowering Prvi.

Family Chloropidae

Dicraeus species

General area; 7 July; sweeping mixed shrubs.

Conioscinella melancholica (Becker)

General area; 22 June to 7 July; sweeping Basa, Psgl, and SALI.

Conioscinella species A

General area; 18 July to 2 August; sweeping Acla and Chmi.

Conioscinella species B

Station 6; 21 July; sweeping foliage of Jusc.

Olcella species

General area; 18 July to 14 August; sweeping Chmi, Chna, and Sese.

Goniopsita species

General area; 7 July to 12 September; sweeping Chna, Pifl, and Psgl.

Thaumatomyia annulata (Walker)

Visitors Center area; 24 June; sweeping flowering Cost.

Thaumatomyia appropingua (Adams)

General area; 30 June; on flowers of Pede.

Thaumatomyia glabra (Meigen)

General area; 15 June to 11 September; on Chna, Cost, and Psgl.

Meromyza pratorum Meigen

General area; 2 July to 13 September; sweeping Chna, Pifl, Psgl, and SALI.

Meromyza saltatrix (Linnaeus)

General area; 28 July; sweeping plant foliage.

Meromyza species

General area; 3 July to 13 September; sweeping Chna and Rowo.

Family Agromyzidae

Pytobia (Calycomyza) jucunda (Wulp)

General area; 6 July.

Phytomyza species

General area; 6 July.

Family Heleomyzidae

Genus ? species ?

Visitors Center area; 12 June; sweeping flowering Cost.

Family Trixoscelididae

Trixoscelis frontalis (Fallen)

General area; 22 July; on flowers of Acla.

Family Anthomyiidae

Scatophaga stercoraria (Linnaeus)

Station 1, 2, 4, 6, 9, 12, and general area; 13 June to 8 September; sweeping Cost, Hela, Pifl, Prvi, SALI, and unidentified Umbelliferae, attracted to black light trap, Malaise trap.

Hylemya (Hylemya) variata (Fallen)

General area; 15 June to 13 August; sweeping Chna.

Hylemya (Delia) aemene (Walker)

Station 12; 1 August to 12 August; sweeping stream-sidevegetation.

Hylemya (Delia) brassicae (Bouche)

Visitors Center area; 24 June; sweeping flowering Cost.

Hylemya (Delia) cerealis (Huckett)

General area; 18 June to 22 June; sweeping Cost and Pifl.

Hylemya (Delia) diviata Huckett

Station 1; 11 August; on flowers of Hela.

Hylemya (Delia) femorata Huckett

Station 12; 1 August to 14 August; sweeping Alte.

Hylemya (Delia) garretti Huckett

Station 9, Grassy Cone, and general area; 17 June to 1 July; sweeping Basa, Cost, and Pifl, Malaise trap.

Hylemya (Delia) ineptifrons Huckett

Station 1 and 12; 11 August to 27 August; on flowers of Hela, Malaise trap.

Hylemya (Delia) lamellicauda Huckett

Station 12 and Visitors Center area; 24 June to 11 August; on flowers of Cost, Malaise trap.

Hylemya (Delia) montana Malloch

Station 3, 12, and general area; 7 July to 8 September; sweeping Chna and seedheads of Elco, Malaise trap.

Hylemya (Delia) neomexicana Malloch

Station 3, 4, 8, 9, 11, and general area; 16 June to 13 August; sweeping Basa, Chna, Cost, PENS, Pifl, and Prvi, attracted to white light, Malaise trap.

Hylemya (Delia) pilitarsis Stein

Station 11 and 12; 16 July to 11 August; on flowers of Hela, Malaise trap.

Hylemya (Delia) platura (Meigen)

Station 2, 9, 11, 12, and general area; 18 June to 27 August; on flowers of Sese, Malaise trap.

Hylemya (Delia) setiventris setiventris Stein

Station 11; 12 July to 14 August; sweeping Artr, Malaise trap.

Hylemya (Delia) species

Station 12; 14 August; sweeping streamside vegetation.

Hylemya (Botanophila) robusta Stein

Station 1; 5 July; on flowers of Hela and Phle.

Hylemya (Pegohylemyia) betarum (Linter)

Visitors Center area; 16 June; attracted to black light trap.

Hylemya (Paregle) cinerella (Fallen)

General area; 24 June to 13 September; on Acla, Chmi, Chna, Chvi, and Cost, attracted to black light trap.

Alliopsis species

No collection data are available. Specimens of this genus are under the study of H. C. Huckett, Riverhead, New York.

Pegomya (Pegomya) hyoscyami betae (Curtis)

Station 3 and general area; 24 June to 24 August; sweeping flowering Cost, Malaise trap.

Pegomya (Pegomya) lividiventris Huckett

Station 12; 13 August; Malaise trap.

Pegomya (Nupedia) acutipennis Malloch

Station 6; 17 September; Berlese plants of Ptte.

Pegomya (Nupedia) anabnormis Huckett

Station 12; 28 July; attracted to black light trap.

Hydrophoria divisa (Meigen)

Station 4 and general area; 24 June to 17 August; on flowers of Cost and Chna.

Two specimens were prey of Phymata americana coloradensis Melin (Phymatidae) while visiting the flowers of Chna.

Hydrophoria wierzejskii (Mik)

Station 2; 24 August; sweeping Rice.

Leucophora albiseta (von Roser)

Station 12; 27 August; sweeping foliage of Potr.

Family Muscidae

Schoenomyza dorsalis Loew

Station 12 and general area; 28 July to 30 August; sweeping Chna.

Schoenomyza litorella (Fallen)

Sunset Cone; 13 August; sweeping mixed shrubs.

Coenosia (Limosia) anthracina Malloch

Station 12; 1 August; on flowers of Hela.

Coenosia (Limosia) cilicauda Malloch

General area; 6 July; in flight.

Coenosia (Limosia) sexnotata Meigen

Station 1; 1 August; sweeping streamside vegetation.

Lispe cotidiana Snyder

Station 3; 23 August; Malaise trap.

Lispe nasoni Stein

Station 12; 13 August; Malaise trap.

Lispe neouliginosa Snyder

Station 12; 13 August; Malaise trap.

Lispe patellata Aldrich

Station 2; 12 July to 13 July; sweeping Rice, sweeping mixed grasses.

Lispe tentaculata (DeGeer)

Station 12; 27 August; sweeping Potr 2.

Spilogona magnipunctata (Malloch)

Station 1, 2, 4, 11, 12, and general area; 5 July to 27 August; sweeping flowers of Hela, attracted to black light trap, Malaise trap.

Spilogona sororcula (Zetterstedt)

Station 1; 1 August; sweeping flowers of Hela.

Helina bohemani (Ringdahl)

Station 2 and 11; 27 June to 23 July; on flowers of Erov, Malaise trap.

Helina cinerella (Wulp)

Station 2 and 11; 12 July to 13 July; Malaise trap.

Helina duplicata (Meigen)

General area; 20 June to 1 August; on flowers of Acla, Chna, and Sese, attracted to black light trap, attracted to white light.

Helina multiseriata Malloch

Station 2, 11, and 12; 16 July to 19 August; Malaise trap.

Helina orbitaseta (Stein)

General area; 12 July; in flight.

Helina troene (Walker)

Station 2, 3, 4, 9, 11, 12, and general area; 17 June to 13 September; sweeping Cost, Psgl, and Syva, attracted to black light trap, attracted to white light, Malaise trap.

Helina species

No collection data are available. Specimens of this genus are under the study of H. C. Huckett, Riverhead, New York.

Quadrularia laetifica (Robineau-Desvoidy)

Station 2, 9, 11, 12, and general area; 17 June to 14 August; sweeping Alte, Artr, and Psgl, attracted to black light trap, Malaise trap.

Myospila meditabunda (Fabricius)

Station 9 and 12; 17 June to 13 August; Malaise trap.

Fannia manicata (Meigen)

Station 12 and general area; 14 August to 27 August; sweeping Potr 2, in flight.

Pogonomyia minor Malloch

Station 1, 2, 3, 12, and Visitors Center area; 13 June to 30 June; on Basa, Cost, Erov, Hela, POTE, ZYGA.

Lasiops (Lasiops) septentrionalis ? (Stein)

Station 1, 12, and general area; 23 June to 11 August; sweeping flowering Cost, on Hela.

Phaonia (Phaonia) caerulescens (Stein)

Station 12; 27 June; on foliage of Hela.

Phaonia (Phaonia) pallidosa Huckett

Station 12; 14 August; sweeping streamside vegetation.

Phaonia (Phaonia) texensis flavofemorata Malloch

Station 2 and general area; 1 July to 25 July; Malaise trap, on ground.

Phaonia (Phaonia) species

The specimens of this species are under the study of H. C, Huckett, Riverhead, New York. No collection data are available.

Muscina assimilis (Fallen)

Station 2 and Visitors Center area; 24 June to 23 July; sweeping Cost, Malaise trap.

Muscina stabulans (Fallen)

Station 4, 12, and general area; 23 June to 27 August; sweeping Cost and Potr 2, in carrion, in fly trap.

Pararicia pabulorum (Fallen)

Station 9; 19 June; Malaise trap.

Graphomya maculata (Scopoli)

Station 1 and Visitors Center area; 20 June to 24 June; sweeping Cost, in flight.

Orthellia caesarion (Meigen)

Station 2, 3, 12, and general area; 24 June to 12 September; on flowers of Chna, Cost, and Erum, Malaise trap.

Musca autumnalis DeGeer

Station 12; 27 August; sweeping Potr 2.

Family Calliphoridae

Phormia regina (Meigen)

Station 2, 3, 4, 8, 11, 12, and general area; 13 June to 17 September; on Cost, Erov, Hela, and Potr 2, Malaise trap, meat trap, reared from dead mule deer.

Protophormia terraenovae (Robineau-Desvoidy)

Station 1, 2, 9, and general area; 7 March to 5 July; on Cost and Pifl, Malaise trap, on ground, reared from dead yellowbelly marmot.

Protocalliphora species

No collection data are available. Specimens of this genus are under the study of Curtis W. Sabrosky, U. S. National Museum, Washington, D. C.

Phaenicia sericata (Meigen)

Station 4 and general area; 22 June to 17 July; on flowers of Acla and Cost, meat trap.

Eucalliphora lilaea (Walker)

Station 2, 3, 4, 9, 11, 12, and general area; 18 June to 23 August; on Cost, Hela, POTE, and Rowo, Malaise trap, fly trap, reared from dead yellowbelly marmot.

Calliphora coloradensis Hough

Station 4 and general area; 27 June to 18 July; fly trap.

Calliphora livida Hall

Station 4, 12, and general area; 24 June to 17 July; on flowers of Cost and Phle, meat trap.

Calliphora vomitoria (Linnaeus)

Station 12 and Visitors Center area; 18 June to 1 August; sweeping flowers of Hela, in flight.

Cynomuopsis cadaverina (Robineau-Desvoidy)

General area; 22 June to 14 August; sweeping flowers of Cost, in flight.

Pollenia rudis (Fabricius)

Station 8; 28 June; Malaise trap.

Family Sarcophagidae

Amobia (Amobia) aurifrons (Townsend)

Station 1 and general area; 1 July to 11 August; on flowers of Hela, sweeping Pifl.

Eumacronychia rohweri Allen

Station 2 and 9; 13 June to 22 June; on flowers of POTE, Malaise trap.

Gymnoprosopa inflaticornis Allen

Station 9; 18 July; Malaise trap.

Hilarella hilarella (Zetterstedt)

Station 2, 9, 11, and 12; 19 June to 11 August; Malaise trap.

Metopia (Metopia) argyrocephala (Meigen)

Station 2 and 12; 23 July to 13 August; Malaise trap.

Senotainia flavicornis (Townsend)

General area; 2 August; on flowers of Chna.

Senotainia trilineata (Wulp)

Visitors Center area; 28 July; on flowers of Acla.

Senotainia vigilans Allen

Station 2, 11, and 12; 14 July to 13 August; on flowers of Chvi, Malaise trap.

Sphenometopa tergata (Coquillett)

Station 2 and 12; 18 July to 13 August; Malaise trap, fly trap.

Taxigramma heteroneura (Meigen)

Station 11 and 12; 16 July to 1 August; on flowers of Hela, Malaise trap.

Wohlfahrtia vigil (Walker)

Station 4 and general area; 30 June to 18 September; on flowers of Acla and Erov, fly trap.

Blaesoxipha (Acridiophaga) aculeata (Aldrich)

Station 2, 9, and 12; 17 June to 19 August; sweeping Prvi, Malaise trap.

Blaesoxipha (Blaesoxipha) atlanis (Aldrich)

General area; 27 August; sweeping Chna.

Blaesoxipha (Blaesoxipha) hunteri (Hough)

General area; 7 July to 27 August; on Hela, Pifl,and Potr 2, Malaise trap.

Blaesoxipha (Blaesoxipha) opifera (Coquillett)

Station 4, 12, and general area; 5 July to 30 August; on flowers of Acla, Chmi, Chna, Hean, Hela, and Sese, attracted to black light trap.

Blaesoxipha (Kellymyia) kellyi (Aldrich)

Station 4 and Visitors Center area; on flowers of Cost, Malaise trap.

Ravinia (Ravinia) lherminieri (Robineau-Desvoidy)

Station 1, 2, 3, 4, 8, 11, 12, and general area; 13 June to 12 September; on Basa, Chna, Cost, Erov, Erum, Meof, and Phle, attracted to black light trap.

One pair were in copulation on a pahoehoe rock on 15 July at station 11. One specimen was observed as prey of Efferia frewingi Wilcox (Asilidae) on 4 September.

Ravinia (Ravinia) planifrons (Aldrich)

Station 2 and 12; 27 June to 30 August; on Chmi, Chna, and Hela, Malaise trap.

Ravinia (Ravinia) querula (Walker)

Station 3, 8, 9, 10, 11, 12, and general area; 18 June to 23 August; on Erum, Hela, and Sese, Malaise trap.

Sarcophaga bullata Parker

Station 4 and general area; 11 June to 14 July; attracted to black light trap, on ground.

Sarcophaga cooleyi Parker

General area; 30 June to 13 September; on Chna, in flight.

Family Tachinidae

Gymnosoma filiola Loew

General area; 26 June to 11 August; on flowers of Basa, Cost, Erov, Hela, and Sese.

Gymnosoma fuliginosum Robineau-Desvoidy

General area; 28 July to 1 August; on flowers of Acla and Hela.

Xanthomelanodes arcuatus (Say)

Station 11; 17 July; Malaise trap.

Xanthomelanodes californicus Townsend

General area; 25 August; sweeping Chmi.

Hyalomya aldrichii Townsend

General area; 30 June to 31 August; on flowers of Acla, sweeping Chmi, Chna, Chvi, on flowers of Erov.

Cylindromyia (Cylindromyia) californica (Bigot)

General area; 7 July to 11 August; on Acla, Chvi.

Cylindromyia (Cylindromyia) decora Aldrich

General area; 15 July to 2 August; on Acla and Chvi, Malaise trap.

Cylindromyia (Cylindromyia) fumipennis (Bigot)

General area; 19 June to 27 August; on Chmi, Chna, Chvi, Hela, SALI, and Sese.

Cylindromyia (Neocyptera) compressa Aldrich

General area; 18 July to 11 August; on Acla, Hela, and Sese.

Cylindromyia (Neocyptera) doriades (Walker)

General area; 7 July; sweeping shrub foliage.

Leucostoma gravipes Wulp

Station 11 and general area; 13 July to 18 July; on flowers of Acla, Malaise trap.

Leucostoma perrarum Reinhard

General area; 5 July; on flowers of Acla.

Leucostoma simplex (Fallen)

General area; 5 July to 11 August; on flowers of Acla, Chmi, and Chvi.

Microchaetina valida (Townsend)

General area; 21 August to 12 September; on Chna.

Reinhardiana petiolata (Townsend)

Station 3, 4, and general area; 8 August to 26 August; on Chna, Malaise trap.

One specimen was prey of the spider Misumena vatia (Clerck) while visiting the flowers of Chna.

Steveniopsis rubidiapex (Reinhard)

General area; 25 August; on ERIO.

Arctophyto gillettei (Townsend)

Station 1 and general area; 27 June to 5 July; on Erov.

Dinera grisescens (Fallen)

Station 11, 12, and general area; 7 July to 14 August; sweeping Chna, Meof, and Sese, Malaise trap.

Mochlosoma illocale Reinhard

General area; 12 September; sweeping flowering Chna.

Ptilodexia species

Station 1, 2, and 11; 27 June to 25 July; Malaise trap.

Nowickia (Echinomyodes) evanida (Reinhard)

Station 12; 19 August; Malaise trap.

Nowickia (Echinomyodes) latigena (Tothill)

Station 11 and general area; 11 July to 6 September; on flowers of Chmi, Chna, and Erov, Malaise trap.

Nowickia (Echinomyodes) lutzi (Curran)

Station 3, 11, and general area; 12 July to 8 September; Malaise trap.

Nowickia (Echinomyodes) piceifrons (Townsend)

General area; 26 August to 6 September; on flowers of Chna.

Nowickia (Rhachogaster) algens ? (Weidemann)

General area; 24 August; sweeping plant foliage.

Nowickia (Rhachogaster) latianulum (Tothill)

Station 11 and general area; 3 July to 11 September; on flowers of Pede, Malaise trap.

Nowickia (Rhachogaster) nitida (Wulp)

Station 6, 8, 9, 11, and general area; 18 June to 12 September; on flowers of Chna, Erov, and Sese, Malaise trap.

Peleteria (Oxydosphyria) iterans (Walker)

Station 9 and 12; 19 June to 27 August; Malaise trap.

Peleteria (Sphyromyia) anaxias (Walker)

Station 12; 19 August; Malaise trap.

Peleteria (Sphyromyia) bryanti Curran

General area; 11 August to 27 August; on flowers of Asca, Chna, and Sese.

Peleteria (Sphyromyia) malleola (Bigot)

Station 2, 3, 8, 9, 11, 12, and general area; 18 June to 12 September; on flowers of Chna, Chvi, and Erov, Malaise trap.

Peleteria species

General area; 11 August to 12 September; on Asca, Chmi, Chna, and Sese.

Epalpus signifer (Walker)

General area; 1 July; sweeping plant foliage.

Deopalpus contiguus (Reinhard)

Station 2, 3, 7, 9, and 12; 18 June to 23 August; on Erov, Malaise trap.

Bonnetia comta (Fallen)

Station 3 and 12; 13 August; in flight, Malaise trap.

Mericia alberta Curran

Station 12; 13 August; Malaise trap.

Melanophrys flavipennis Williston

Station 11; 27 June; on flowers of Erov.

Aphria ocypterata Townsend

Station 12; 11 August to 13 August; on flowers of Sese, Malaise trap.

Chaetophlepsis eudryae (Smith)

Station 3 and general area; 11 August to 11 September; sweeping SALI, Malaise trap.

Chaetophlepsis rindgei Reinhard

Station 3, 9, and general area; 27 June to 24 August; Malaise trap.

Chaetophlepsis species

Station 3; 27 August; Malaise trap.

Anthrycia cinerea (Coquillett)

Station 2, 6, 8, 9, 11, 12, and general area; 21 June to 13 August; Malaise trap.

Catalinovoria cauta Townsend

General area; 22 June to 7 July; sweeping Basa.

Voria ruralis Fallen

Station 2, 6, 11, and 12; 16 July to 19 August; on Erum, Malaise trap.

Spathidexia reinhardi Arnaud

Station 2, 3, 11, and 12; 16 July to 23 August; Malaise trap.

Eulasiona (Paramuscopteryx) genalis (Townsend)

Station 1; 1 August; sweeping flowers of Hela.

Lasionalia cinerea Curran

Station 12; 1 August; on flowers of Acla.

Muscopteryx nitida Reinhard

Station 2; 23 July; Malaise trap.

Paradidyma apicalis Reinhard

Station 12; 13 August; Malaise trap.

Paradidyma singularis (Townsend)

Station 11, 12, and general area; 19 July to 12 September; on Chna and ERIO, Malaise trap.

Periscepsia helymus (Walker)

Station 2, 6, 7, and 9; 18 June to 21 July; sweeping Jusc, Potr, and SALI, Malaise trap.

Acemya tibialis Coquillett

Station 2, 11, 12, and general area; 14 June to 13 August; sweeping Pifl, Malaise trap.

Blondelia polita ? (Townsend)

Station 2, 3, 9, 12, and general area; 19 June to 24 August; sweeping Cost, Malaise trap.

Eribella polita (Coquillett)

Station 2; 1 August; sweeping SALI.

Euphorocera claripennis (Macquart)

Station 11 and 12; 9 July to 11 August; sweeping flowers of Hela, Malaise trap.

Exorista mella (Walker)

Station 2, 11, and 12; 20 June to 11 August; Malaise trap.

Tachinomyia variata Curran

Station 3; 13 June on ground.

Clausicella neomexicana ? (Townsend)

Station 3 and 12; 13 August to 27 August; Malaise trap.

Clausicella setigera (Coquillett)

General area; 28 June to 30 August; sweeping Chmi, Chna, Chvi, Erov, Phle, and SALI.

Schizotachina convecta ? (Walker)

Station 3 and 9; 19 June to 22 June; sweeping Basa, Malaise trap.

Clastoneuriopsis alberta (Curran)

General area; 3 July to 15 July; sweeping Acla and Psgl.

Clastoneuriopsis deceptor (Curran)

Station 2, 8, Grassy Cone, and Sunset Cone; 13 June to 28 June; sweeping POTE, Prvi, and Syva.

Onychogonia magna Brooks

Station 2, 3, 11, and general area; 28 June to 18 July; on Erov and Sese.

Spallanzania hebes (Fallen)

Station 3, 6, and general area; 1 July to 25 August; on Chmi and Erum.

Chaetogaedia desertorum (Townsend)

General area; 11 September; in flight.

Leschenaultia americana (Brauer and Bergenstamm)

Station 2; 28 June to 25 July; on foliage of Pifl, Malaise trap.

Drino bakeri (Coquillett)

General area; 13 June; on ground.

Drino species

General area; 10 July; in flight.

Mystacella species

Station 3 and 12; 13 August to 24 August; Malaise trap.

Siphosturmia maltana Reinhard

Station 2, 4, and 11; 14 July to 25 July; in carrion, Malaise trap.

Siphosturmia melitaeae (Coquillett)

General area; 25 August; sweeping Chmi.

Nemorilla pyste (Walker)

Station 2; 1 August; sweeping Rice.

Hubneria estigmenensis (Sellers)

Station 2; 23 July; Malaise trap.

Aplomya theclarum (Scudder)

Station 1, 2, 8, and 11; 9 July to 13 August; Malaise trap.

Ceromasia aurifrons Townsend

Station 1; 27 June to 11 August; sweeping flowers of Hela.

Frontiniella parancilla Townsend

General area; 30 August; sweeping Chna.

Lespesia archippivora (Riley)

Station 4, 8, and 11; 12 July to 19 July; in fly trap, Malaise trap.

Lespesia ciliata (Macquart)

Station 12; 27 August; sweeping Potr 2.

Lespesia flavifrons Beneway

Station 11; 14 July; Malaise trap.

Lydella radicis (Townsend)

General area; 24 June; on leaves of Ptte.

Madremyia saundersii (Williston)

General area; 7 July; sweeping shrub foliage.

Patelloa species

Station 2; 23 July to 25 July; Malaise trap.

Pilatea species

Station 2; 3 July to 23 July; Malaise trap.

ORDER HYMENOPTERA

The catalog of Muesebeck et al (1951) and the supplement of Krombein (1958) were used when possible. Changes in the classification of several groups that have occurred since 1958 have been incorporated into the list on the advisement of taxonomic specialists.

SUBORDER SYMPHYTA

Family Argidae

Arge clavicornis (Fabricius)

Station 3 and 12; 17 June to 10 July; swept from flowers of *Basa* and *Hela*.

Family Cimbicidae

Zaraea americana Cresson

Grassy Cone; 17 June; foliage of *Psgl*.

Family Diprionidae

Neodiprion abietis group

Station 2 and Grassy Cone; 11 June to 20 July; on foliage of *Pifl*, *Psgl*, and *SALI*.

Heavy infestations of larvae were observed on *Pifl* and *Psgl* on Grassy and Sunset Cones. Larvae were also seen on *Pifl* in the Devils Orchard area and Big Craters area. In areas where larvae were present in large numbers, and where both species of host tree were present, the preferred host was *Pifl*. The peak of larval

feeding activity was in the last week of June. Cocoons were collected under rocks and logs and in duff under trees and shrubs on the northeast side of Sunset Cone in September for rearing.

Family Tenthredinidae

Hemichroa (Hemichroa) crocea (Fourcroy)

Station 12; 28 July; attracted to black light trap.

Pristiphora species

Station 2; 25 July; Malaise trap.

Nematus (Pteronidea) oligospilus ? Foerster

Station 2; 24 July; Malaise trap.

Nematus (Pteronidea) species

Station 12; 11 August; Malaise trap.

Phyllocolpa species

Station 1; 5 July; on foliage of Rowo.

Aphilodyctium fidum (Cresson)

East slope of Sunset Cone; 28 June; on stem of Syva.

Monophadnoides geniculatus (Hartig)

Station 1; 14 June; on flowers of Basa.

Rhogagaster addenda (Cresson)

Devils Orchard; 14 June; swept from foliage of Psgl.

Tenthredo maxima (Norton)

Staion 1 and 12; 23 June to 7 July; on flowers of Hela.

On 7 July, an adult female was found resting on the

flowers of Hela with a male Tenthredo xantha Norton grasped between her front legs. She tore off the fore and hind wings on one side and then chewed off one antenna, two legs, and the head. She then began feeding on the thorax of the captured specimen. After two minutes of feeding, she dropped the specimen, and flew away.

Tenthredo opima (Cresson)

Station 1; 18 July; on flowers of Hela.

Tenthredo xantha Norton

Station 12, Grassy Cone, and Visitors Center and Residential area; 14 June to 14 July; on Amal, Cost, flowers of Hela, Prvi, Rowo, unidentified Umbelliferae, and Urly.

Tenthredo species

Station 12; 18 July; on flowers of Hela.

Family Cephidae

Cephus (Cephus) cinctus Norton

Station 4 and 12; 18 June to 22 June; sweeping Elco.

SUBORDER APOCRITA

Family Braconidae

Ephedrus species near californicus Baker

General area; 1 August; sweeping plant foliage.

Aphidius species A

Visitors Center area; 5 July; sweeping Meof.

Aphidius species B

General area; 19 July; on Chmi.

Meteorus hyphantriae Riley

General area; 1 July to 12 September; sweeping foliage of Chna and Pifl.

Meteorus leviventris (Wesmael)

General area; 23 June to 28 July; attracted to white light, Malaise trap.

Meteorus species possibly hypophloei Cushman

General area; 14 June; on foliage of Pifl.

Meteorus species

Station 3; 23 August; Malaise trap.

Macrocentrus ancylivorus Rohwer

Station 11; 19 July; Malaise trap.

Macrocentrus marginator (Nees)

Station 2; 25 July; Malaise trap.

Macrocentris pulchripennis Muesebeck

Station 4; 14 July; attracted to black light trap.

Helcon pedalis Cresson

Station 12; 28 July; on ground.

Orgilus species

Station 2, 3, 4, and general area; 18 June to 12 September; sweeping Chna and Elco.

Microtypus species

General area; 20 July; attracted to black light trap.

Earinus zeirapherae Walley

General area; 22 June; on foliage of Pifl.

Agathis atripes Cresson

General area; 6 September; on flowers of Chna.

Agathis brevicornis (Muesebeck)

General area; 15 July; in flight.

Agathis californicus (Muesebeck)

Station 12; 14 August; sweeping vegetation.

Agathis gibbosa (Say)

Station 4; 14 July; sweeping Elco.

Agathis nigripes Cresson

General area; 30 June; on Pede.

Agathis species nova

General area; 27 August to 13 September; sweeping Chna and Chvi.

Agathis species

General area; 17 June to 5 September; sweeping Chna, Chvi, and Psgl.

Apanteles aristoteliae Viereck

General area; 19 July to 30 August; sweeping Chmi, Chna, and Phle.

Apanteles bedelliae Viereck

General area; 23 June to 9 August; on Chmi, SALI, and unidentified Umbelliferae.

Apanteles monticola Ashmead

Station 2 and 11; 12 July to 25 July; on dead branch of Artr, Malaise trap.

Apanteles neomexicanus Muesebeck

General area; 29 July; on flowers of Acla.

Apanteles yakutatensis Ashmead

Station 2; 24 August; sweeping mixed grasses.

Apanteles species near limenitidis (Riley)

General area; 9 August; sweeping Chmi.

Apanteles species A

General area; 3 September to 13 September; sweeping Chna.

Apanteles species B

General area; 11 August to 12 September; sweeping Chna and Chvi.

Apanteles species C

General area; 19 July; sweeping Chmi and Phle.

Apanteles species D

Station 4, 10, and general area; 26 July to 12 September; sweeping Chmi and Chna.

Apanteles species E

Station 12; 23 June; sweeping unidentified Umbelliferae.

Microgaster comptanae Viereck

Station 3 and general area; 13 June to 24 June; sweeping Basa and Cost.

Microgaster species

Station 3; 22 June; sweeping flowering Basa.

Microplitis species

General area; 14 July; sweeping Phle.

Ascogaster species

Station 11; 19 July; Malaise trap.

Chelonus (Chelonus) muesebecki McComb

Station 12 and general area; 3 July to 1 August; sweeping flowers of Hela, in flight.

Chelonus (Chelonus) species

Station 11; 19 July; Malaise trap.

Chelonus (Microchelonus) species

Station 9; 21 June; Malaise trap.

Brachystropha ? species

General area; 22 June; sweeping Basa.

Dacnusa species

Station 9; 17 June; Malaise trap.

Opius species

General area; 1 August; sweeping mixed shrubs.

Iphiaulax species

Station 12; 27 August; sweeping Potr 2.

Atanycolimorpha species

General area; August; reared from dead Pifl.

Cyanopterus species

General area; 22 June; sweeping Pifl.

Atanycolus species near charus (Riley)

General area; 22 June to 18 August; swept from Pifl, reared from dead Pifl.

Bracon curtus (Provancher)

General area; 3 August; on flowers of Mela.

Bracon erucarum (Cushman)

General area; 24 June to 18 July; on Cost, Ptte, and Sese.

Bracon gelechiae Ashmead

General area; 22 June; sweeping Basa.

Bracon hyslopi (Viereck)

General area; 13 September; sweeping Chna.

Bracon lissogaster Muesebeck

Station 6; 10 August; sweeping mixed shrubs.

Bracon nitidulus Dalle Torre

Station 6; 14 July; on LUPI.

Bracon nuperus Cresson

Station 1; 27 August; sweeping plant foliage.

Bracon pygmaeus Provancher

Sunset Cone; 25 June; sweeping plant foliage.

Bracon rhyacioniae (Muesebeck)

General area; 15 June; on Pifl.

Bracon tychii (Muesebeck)

Station 4 and 12; 12 June to 11 August; sweeping Chna, Malaise trap.

Bracon species near hyslopi (Viereck)

General area; 9 August; on Chmi.

Bracon species near pygmaeus Provancher

General area; 2 July; sweeping Psgl.

Bracon species A

General area; 15 June; on foliage of Pifl.

Bracon species B

Station 6; 10 August; sweeping shrub foliage.

Bracon species C

Station 9; 17 June; on foliage of Pifl.

Bracon species D

Station 11; 31 August; sweeping mixed grasses.

Rogas stigmator (Say)

General area; 6 July.

Rogas species A

Station 4; 8 August; on Chna.

Rogas species B

Station 3 and 11; 22 June to 19 July; sweeping Basa, Malaise trap.

Rogas species C

Station 12; 28 July; attracted to black light trap.

Tetrasphaeropyx species

Station 6 and 9; 24 June to 10 August; Malaise trap, sweeping mixed shrubs.

Hormius species

Station 2, 11, and general area; 19 July to 13 September; sweeping Artr and Pifl, Malaise trap.

Noserus species

General area; 9 August; sweeping Chmi.

Ecphylus species

General area; June to September; reared from dead Pifl.

Family Ichneumonidae

Scambus (Atelcophadnus) pterophori (Ashmead)

General area; 24 June; sweeping flowering Cost.

Scambus (Endromopoda) productus ? Walley

Station 12; 14 August to 15 August; sweeping stream-side vegetation, Malaise trap.

Scambus (Scambus) brevicornis ? (Gravenhorst)

Station 12; 11 August to 19 August; Malaise trap.

Scambus (Scambus) dioryctriae ? Walley

General area; 29 August; sweeping foliage of Pifl.

Pimpla irritator (Fabricius)

General area; 31 July; in flight.

Pimpla pedalis Cresson

Station 6; 26 July; on foliage of Pifl.

One adult was reared from the cocoon of a tent caterpillar Malacosoma californica (Packard) which was attached to the needles of a Pifl.

Pimpla sanguinipes erythropus Viereck

Station 2, 12, and general area; 25 July to 12 September; sweeping flowering Chna, Malaise trap.

Perithous mediator neomexicanus (Viereck)

Station 12; 11 August; Malaise trap.

Zatypota percontatoria ? (Muller)

General area; 26 August; sweeping Chna.

Itoplectis viduata (Gravenhorst)

Station 1, 2, and 12; 21 June to 13 August; in flight, Malaise trap.

Theronia atalantae fulvescens (Cresson)

Station 12; 14 August; sweeping mixed shrubs.

Netelia species A

Visitors Center area; 30 June to 8 September; in flight, on ground.

Netelia species B

Station 9 and 12; 21 June to 13 August; Malaise trap.

Netelia species C

Station 12; 13 August; Malaise trap.

Polyblastus (Polyblastus) pedalis (Cresson)

Station 12; 27 August; sweeping foliage of Potr 2.

Polyblastus (Polyblastus) strobilator (Thunberg)

Station 12; 13 August; Malaise trap.

Erromenus (Erromenus) dimidiatus (Cresson)

Station 1; 23 June; sweeping unidentified Umbelliferae.

Erromenus (Erromenus) glabrosus ? Davis

Station 1; 23 June; sweeping unidentified Umbelliferae.

Exenterus tsugae Cushman

Station 2 and general area; 28 June to 25 July; sweeping Pifl, Psgl, and Syva, Malaise trap.

Smicroplectrus species nova

Station 2; 7 July; sweeping Psgl.

Exyston (Exyston) species nova ?

General area; 28 June; on PENS.

Mastrus species

Station 2 and 12; 23 July to 13 August; Malaise trap.

Otacustes species

General area; 1 July; on Pifl.

Gelis tenellus ? (Say)

Station 2; 31 August; sweeping foliage of Psgl.

Gelis species

Station 9, 11, and general area; 21 June to 12 September; sweeping Chna, Malaise trap.

Chirotica sheppardi (Walley)

Station 2; 25 July; Malaise trap.

Endasys species A

Station 12; 11 August; sweeping flowers of Hela.

Endasys species B

Station 12; 11 August; sweeping flowers of Hela.

Endasys species C

Station 2 and 12; 13 July to 27 August; sweeping Potr 2, Malaise trap.

Phygadeuon species A

General area; 22 June; sweeping Basa.

Phygadeuon species B

Station 2 and 12; 9 July to 14 August; on flowers of XANT, Malaise trap.

Phygadeuon ? species A

Station 2, 11, and general area; 24 June to 12 September; on Chna and Cost, Malaise trap.

Phygadeuon ? species B

Station 12; 27 August; sweeping streamside vegetation.

Stilpnus species

General area; 1 July; in flight.

Cryptus albitarsis argentifrons Cameron

Station 2, 11, and 12, 11 July to 11 August; Malaise trap.

Cryptus genatus (Pratt)

Station 2 and general area; 23 June to 25 July; sweeping Cost, Malaise trap.

Cryptus laborator altonii Dalla Torre

Station 1; 23 June; sweeping unidentified Umbelliferae.

Cryptus persimilis Cresson

Station 2, 9, and 11; 21 June to 16 July; Malaise trap.

Cryptus relativus relativus Cresson

Station 12; 19 June to 5 September; on ground.

Cryptus relativus nitschei Dalla Torre

Station 9, 12, and general area; 15 June to 5 September; sweeping Pifl, Malaise trap.

Cryptus symmetricus symmetricus Pratt

General area; 3 July; in flight.

Cryptus species (laborator group prob. altonii Dalla Torre).

Station 4 and 11; 18 June to 14 July; sweeping Elco, Malaise trap.

Cryptus species A

General area; 24 June; on Cost.

Cryptus species B

General area; 12 September; on Chna, on ground.

Cryptus species C

Station 12; 22 August; on Sese.

Compsocryptus apicalis ? Townes

Visitors Center area; 9 August; on flowers of Trre.

Compsocryptus calipterus ? (Say)

Station 12; 23 June; on foliage of Hela.

Compsocryptus resolutus subfasciatus Townes

Station 1; 1 August; sweeping flowers of Hela.

Compsocryptus species near crotchii (Cresson)

Station 12; 18 July; sweeping streamside vegetation.

Mesostenus albinotatus promptus ? Cresson

Station 12; 13 August; Malaise trap.

Mesostenus gracilis Cresson

Station 11 and general area; 19 July to 12 September; sweeping Chna, Malaise trap.

Trychosis species

General area; 11 July; in flight.

Gambrus canadensis exareolatus ? (Viereck)

Station 12; 11 August to 13 August; Malaise trap.

Gambrus species

Station 1 and 12; 1 August to 13 August; sweeping flowers of Hela, Malaise trap.

Aritranis species

Station 12; 13 August; Malaise trap.

Agrothereutes species

Station 12; 13 August; Malaise trap.

Ischnus species near rhomboidalis (Walsh)

Station 12; 13 August; Malaise trap.

Pseudischnus oregonensis oregonensis (Cushman)

Station 2; 25 July; Malaise trap.

Acroricnus stylator niger Mitchell

Station 12; 23 June to 1 August; sweeping Hela.

Messatoporus rufiventris Cushman

Station 12; 19 August; Malaise trap.

Phaeogenes species A

Station 1, 2, 3, 11, and 12; 9 July to 27 August; sweeping streamside vegetation, Malaise trap.

Phaeogenes species B

Station 3 and 12; 11 August to 23 August; Malaise trap.

Phaeogenes (s.l.) species nova

Station 1, 2, 4, 6, 9, 11, 12, and general area; 14 June to 12 September; sweeping foliage of Acla, Artr, Chna, Pifl, Potr 2, Psgl, Rice, and Sese, sweeping streamside vegetation, Malaise trap.

Diadromus ? species

Station 3; 24 July; on Liru

Two adults were reared from pupae of unidentified Lepidoptera found on the foliage of Liru.

Heterischnus (Rhexidermus) species

Station 12; 14 August; sweeping streamside vegetation.

Heterischnus ? species

Station 12; 11 August; Malaise trap.

Centeterus species near euryptychiae (Ashmead)

General area; 12 September; on Chna.

Dicaelotus species A

General area; 12 September; on Chna.

Dicaelotus species B

Station 2 and general area; 13 July to 3 September; on Chna, sweeping plant foliage.

Dicaelotus species C

Station 11 and 12; 13 August to 31 August; sweeping mixed grasses, Malaise trap.

Stenodontus ? species

Station 3; 24 August; Malaise trap.

Platylabus species

Station 11 and general area; 22 June to 13 July; sweeping Pifl, Malaise trap.

Anisobas coloradensis (Cresson)

Station 2 and Visitors Center area; 24 June to 25 July; sweeping Cost, Malaise trap.

Patrocloides montanus occidentalis Heinrich

Station 12; 9 July to 1 August; Malaise trap.

Melanichneumon (s.l.) species (subgenus Barichneumon ?)

Station 2; 25 July; Malaise trap.

Melanichneumon (s.l.) complex

Station 2, 3, 4, 11, and 12; 12 July to 23 August; Malaise trap.

Melanichneumon ? species

Station 11; 16 July; Malaise trap.

Stenobarichneumon species near saudersi (Cresson)

Station 3 and 12; 11 August to 23 August; Malaise trap.

Cratichenumon species

General area; 24 August; in flight.

Cratichneumon ? species

General area; 24 June; sweeping Cost.

Eupalamus malacneme Heinrich

General area; 8 August; on ground.

Stenichneumon pallidipennis (Viereck)

Station 12; 13 August; Malise trap.

Exephanes species A

Station 2, 3, and 11; 11 July to 25 July; Malaise trap.

Exephanes species B

Station 11; 19 July; Malaise trap.

Ectopimorpha ? species

Station 2 and 11; 16 July to 25 July; Malaise trap.

Pseudamblyteles ormenus (Cresson)

Station 9, 12, and general area; 19 June to 27 June; sweeping Hela, Potr, and unidentified Umbelliferae, Malaise trap.

Pseudamblyteles species A

General area; 25 July; on Psgl.

Pseudamblyteles species B

Station 12; 5 July; on Chna.

Pseudamblyteles species C

General area; 29 June; sweeping plant foliage.

Pseudamblyteles species D

General area; 18 June; on Sese.

Pseudamblyteles complex

Station 8, 12, and Visitors Center area; 24 June to 13 August; sweeping Cost and Potr, Malaise trap.

Coelichneumon histricus (Cresson)

Station 1; 11 August; sweeping flowers of Hela.

Coelichneumon species near semilaevis (Cresson)

Station 1; 1 August; sweeping flowers of Hela.

Coelichneumon (s.l.) species

Station 12; 13 August to 19 August; Malaise trap.

Coelichneumon ? species nova ?

Station 12; 11 August; Malaise trap.

Spilichneumon superbus (Provancher)

Station 12; 5 July to 18 July; on Hela.

Tricholabus species nova ? near foxleei Heinrich

Station 11; 17 July to 19 July; Malaise trap.

Ichneumon species near vinulentus Cresson

Station 1; 1 August; sweeping flower heads of Hela.

Ichneumon species nova ?

Visitors Center and Residential area; 24 June; sweeping Cost.

Ichneumon complex

Station 2, 6, 11, 12, and general area; 14 June to 19 August; on Hela and PENS, Malaise trap.

Ichneumon ? species

Station 12 and general area; 11 July to 5 September; on Hela, on ground.

Thyrateles lugubrator (Gravenhorst)

Station 12; 18 July; sweeping streamside vegetation.

Thyrateles mormonus (Cresson)

Station 12; 18 July; sweeping plant foliage.

Thyrateles species near lugubrator (Gravenhorst)

Station 2; 13 July to 23 July; sweeping mixed shrubs, Malaise trap.

Thyrateles ? species

Station 12; 13 August; Malaise trap.

Catadelphus buccatus (Cresson)

Station 11; 5 July to 9 July; sweeping Chna.

Protichneumon effigies Heinrich

Station 12; 18 June to 27 August; sweeping Potr 2.

Glypta species nova A

Station 4; 18 July; sweeping Elco.

Glypta species nova B

Station 3; 27 August; Malaise trap.

Glypta species

General area; 25 August; sweeping Chmi.

Lampronota coloradensis Cresson

Station 11; 16 July; Malaise trap.

Lissonota (Lissonota) montana (s.l.) (Cresson)

Station 1, 2, 12, and general area; 23 July to 13 August; sweeping Hela, Malaise trap.

Lissonota species

Station 1; 5 July; sweeping Hela.

Pimplopterus species A

Station 12; 13 August; Malaise trap.

Pimplopterus species B

Station 9 and 11; 19 June to 19 July; Malaise trap.

Pimplopterus ? species

General area; 13 September; on Chna and Chvi.

Exetastes rufipes ? Cresson

Station 2, 11, and general area; 24 June to 17 July; sweeping Chna and Cost.

Exetastes species

General area; 12 September; on Chmi.

Rhorus (Cyphanza) pilosus (Davis)

Station 1; 23 June; sweeping unidentified Umbelliferae.

Himerta species nova ? near rubiginosa (Cresson)

Station 11; 11 July; Malaise trap.

Lamachus angularius (Davis)

Station 2; 28 June; on foliage of Psgl.

Syndipnus species nova ?

Station 12; 28 July; attracted to black light trap.

Diplazon laetatorius (Fabricius)

Station 2, 3, 12, and general area; 13 August to 24 August; Malaise trap.

Sussaba species nova ? near elongatus (Provancher)

Station 2; 24 August; sweeping plant foliage.

Homotropus nigritarsus fuscitarsus (Provancher)

General area; 10 August; on foliage of Chmi.

Chorinaeus species

Grassy Cone; 17 June; on foliage of Prvi.

Triclistus species

General area; 24 June to 26 June; sweeping Cost and Prvi.

Hypsicera species

Station 2; 1 August; sweeping SALI.

Exochus species

Station 3; 23 August; Malaise trap.

Cymodusa species

Station 11; 19 July; Malaise trap.

Cymodusopsis aristoteliae ? Viereck

General area; 19 August; on Chmi.

Campoplex species

General area; 7 July; sweeping plant foliage.

Campoplex complex

Station 2, 9, and 12; 14 June to 19 August; sweeping Hela and Pifl, Malaise trap.

Campoplex ? species

General area; 12 September; on Chna.

Campoplex ? complex

Station 2, 11, and 12; 12 July to 11 August; Malaise trap.

Campoletis species

General area; 24 June to 6 September; sweeping Basa and Chna.

Campoletis species complex

Station 2, 3, 6, 11, and 12; 24 June to 23 August; on Elco, Malaise trap.

Campoletis ? complex

Station 2, 9, 11, and 12; 19 June to 13 August; Malaise trap.

Dusona lapponica kukakensis ? (Ashmead)

General area; 7 July; sweeping plant foliage.

Dusona nigritibialis (Viereck)

General area; 7 July; sweeping foliage of Psgl.

Dusona species A

Station 3 and 11; 14 July to 25 August; Malaise trap.

Dusona species B

Station 2; 23 July; Malaise trap.

Dusona species C

Station 1; 23 June; sweeping unidentified Umbelliferae.

Diadegma species

General area; 7 July to 13 September; sweeping Chna, Chvi, and Pifl.

Diadegma ? species

Station 11, 12, and general area; 19 July to 12 September; sweeping Chna, Malaise trap.

Hyposoter species

Station 12; 13 August; Malaise trap.

Hyposoter ? species

Station 11; 19 July; Malaise trap.

Olesicampe species nova

Station 2; 25 July; Malaise trap.

Benjaminia species nova

Station 1; 1 August to 11 August; sweeping Hela, Urly, and Veth.

Benjaminia species

Station 12; 18 July; sweeping Hela.

Dimophora prima (Cushman)

Station 3 and general area; 27 August to 13 September; sweeping Chna and Chvi, Malaise trap.

Pristomerus species nova ?

Visitors Center; 18 June; on south-facing window.

Cremastus species

General area; 29 August; on Chna.

Temelucha species

General area; 24 June; sweeping Cost.

Barycnemis species

General area; 12 September; on Chna.

Anomalon reticulatum ? (Cresson)

Station 11; 19 July; Malaise trap.

Anomalon species nova A

General area; 12 September; sweeping Chna.

Anomalon species nova B

General area; 7 July; sweeping foliage of SALI.

Trichomma maceratum (Cresson)

Station 1 and general area; 14 June to 19 June; on Pede and Pifl.

Aphanistes species

Station 12; 18 July; sweeping streamside vegetation.

Barylypa ? species

Station 4; 14 July; sweeping Elco.

Erigorgus species

Station 12; 18 July; sweeping streamside vegetation.

Ophion species A

Station 4, 12, and general area; 12 June to 14 August; on Chmi, attracted to black light trap, attracted to white light.

Ophion species B

Station 12; 28 July; attracted to black light trap.

Genophion costalis (Cresson)

General area; 24 June; sweeping Cost.

Chilophion abnormalis (Felt)

Station 1 and 11; 5 July to 16 July; on Hela, Malaise trap.

Enicospilus species

Station 4 and 11; 12 July to 16 July; attracted to white ligh, Malaise trap.

Mesochrous species A

Station 9 and general area; 19 June to 12 September; on Pifl, attracted to white light, Malaise trap.

Mesochrous species B

Station 2; 25 July; Malaise trap.

Trichionotus species

General area; 6 July; on Erov.

Family Eulophidae

Sympiesis stigmatipennis Girault

General area; 29 August; on Chna.

Tetrastichus species

Station 2 and general area; 22 June to 13 September; on Artr, Basa, Chmi, sweeping seedheads of Elco, on Psgl.

Euderus species

General area; 9 August; on Chmi.

Chrysocharis species

General area; 28 July to 1 August; sweeping plant foliage.

Family Encyrtidae

Copidosoma bakeri (Howard)

General area; 7 July; sweeping plant foliage.

Bothriothorax species

Station 1; 7 July; sweeping plant foliage.

Microterys titiani Girault

Station 2; 31 August; sweeping Psgl.

Family Eupelmidae

Eupelmus species

Station 4; 18 June; sweeping Elco.

Family Perilampidae

Perilampus chrysopae Crawford

Station 6; 10 August; sweeping mixed shrubs.

Perilampus fulvicornis fulvicornis Ashmead

General area; 22 June to 3 July; on flowers of Acla, and Basa.

Perilampus hyalinus Say

Station 1, 12, and general area; 18 July to 27 August; on CHEN, Hela, Potr 2, and Sese, Malaise trap.

Family Torymidae

Torymus aeneoscapus (Huber)

General area; 13 September; sweeping Chna.

Torymus citripes (Huber)

Station 11 and general area; 19 July to 12 September; sweeping Chna, Malaise trap.

Torymus species

General area; 22 June to 13 September; on Artr, Chmi, Chna, Phle 2, and Psgl.

Monodontomerus bakeri Gahan

Station 9; 19 June; Malaise trap.

Monodontomerus dentipes (Dalmon)

General area; 28 July; sweeping plant foliage.

Monodontomerus montivagus Ashmead

Station 2 and general area; 23 June to 12 September; sweeping Chna, Pifl, and Psgl.

Monodontomerus species

Station 2; 28 June; on Psgl.

Pseudotorymus lazulellus (Ashmead)

General area; 2 August; on Chmi and Chvi.

Family Pteromalidae

Asaphes species

General area; 3 September to 13 September; on flowers of Chna.

Lamprotatus species

Station 2; 14 July; sweeping mixed shrubs.

Pachyneuron species

Station 2; 31 August; sweeping Psgl.

Halticoptera species

Station 2, 3, and general area; 16 June to 27 August; on Basa, Chmi, Chna, Phle 2, and Psgl, attracted to black light trap.

Heteroschema prima Gahan

General area; 22 June; on Pifl.

Heteroschema species

Station 2; 13 July; sweeping Potr.

Tridymus species

Station 3 and general area; 5 July to 18 July; sweeping Sese, in flight.

Rhopalicus pulchvipennis (Crawford)

General area; 13 June; on foliage of Pifl.

Amblymerus bruchophagi (Gahan)

General area; 11 August; on Chna.

Amblymerus verdifer (Norton)

Station 1, 4, 6, and general area; 1 August to 13 September; sweeping Chmi, Chna, Chvi, and seedheads of Elco.

Platyterma species

Station 1, 2, 4, and 9; 18 June to 14 July; sweeping seedheads of Elco, on unidentified Umbelliferae, Malaise trap.

Eupteromalus species

General area; 25 August; on Chmi.

Catolaccus aeneoviridis (Girault)

General area; 9 August; sweeping flowering Chmi.

Catolaccus victoria Burks

General area; 2 August; sweeping Chvi.

Zatropis species

Station 2, 6, and general area; 17 June to 12 September; sweeping Chna, Jusc, Prvi, and Psgl.

Caenacis species

General area; 5 July to 13 September; sweeping Chna, on flowers of Luca.

Habrocytus coloradensis (Ashmead)

General area; 25 August; on Chmi.

Habrocytus medicaginis Gahan

Station 10 and general area; 12 July to 26 July; on Acla and Chmi.

Habrocytus piercei Crawford

General area; 30 August; on Chna.

Habrocytus species

Station 2, 3, 10, 11, 12, and general area; 22 June to 13 September; sweeping Artr, Basa, Chmi, Chna, Phle 2, Potr 2, and Psgl.

Hypopteromalus species

Station 3; 5 July; sweeping mixed shrubs.

Colotrechnus species

General area; 22 June; sweeping Basa.

Family Eurytomidae

Harmolita elymophaga Phillips and Emery

Station 4; 18 June; sweeping Elco.

Harmolita species

Station 4; 18 June; sweeping Liru.

Eurytoma juniperina juniperiana Marcovitch

Station 6; 29 August; sweeping foliage of Jusc.

Eurytoma species A

General area; 22 June to 29 August; sweeping Basa, Chna, and Meof.

Eurytoma species B

Station 6; 29 August; sweeping foliage of Jusc.

Bruchophagus species

Station 2; 3 July; on POTE.

Family Chalcididae

Phasgonophora sulcata Westwood

General area; September; reared from dead Pifl.

Trigonura pini Burks

General area; 27 August; sweeping seedheads of Elco.

Brachymeria compsilurae (Crawford)

Station 2 and general area; 13 July to 1 August; sweeping SALI, Malaise trap.

Brachymeria tegularis (Cresson)

General area; 3 September; on Chna.

Spilochalcis albifrons (Walsh)

General area; 9 August; on Chmi.

Spilochalcis leptis Burks

Station 1, 2, 6, and 12; 14 July to 5 September; sweeping Chna, Jusc, Potr 2, and Psgl.

Invreia species

Visitors Center area; 5 July; sweeping Meof.

Family Leucospidae

Leucospis affinis affinis Say

Station 2; 1 August; sweeping SALI.

Family Figitidae

Paraspicera species

Station 3; 24 July; on Liru.

Aegilips species

Station 2; 25 July; Malaise trap.

Omalaspis nigra (Hartig)

Station 11; 17 July to 19 July; Malaise trap.

Family Cynipidae

Kleidotoma species

General area; 18 July; on Sese.

Charips species

General area; 18 July; on Sese.

Aspicera species

General area; 22 June; on Basa.

Family Aulacidae

Pristaulacus species nova ? or rufitarsis (Cresson)

General area; 22 June; on Pifl.

Family Gasteruptiidae

Gasteruption species A

General area; 5 September; sweeping Chna.

Gasteruption species B

General area; 10 July; sweeping plant foliage.

Rhydinofoenus occidentalis (Cresson)

Station 11; 15 July; in flight.

Family Proctotrupidae

Proctotrupes species

Station 12 and general area; 12 July to 13 August; attracted to black light trap, attracted to white light, Malaise trap.

Family Diapriidae

Diapria species

Station 2; 13 July; sweeping Potr.

Belyta species

General area; 2 July to 12 September; sweeping Chna and Psgl.

Family Scelionidae

Sparasion pilosum Ashmead

General area; 10 July to 1 August; in grass.

Sparasion species

Station 11; 17 July; Malaise trap.

Family Chrysididae

Holopyga species

Station 12 and general area; 1 August to 29 August; on flowers of *Chna* and *Hela*.

Hedychridium species

Station 12; 1 August to 13 August; on flowers of *Hela*, Malaise trap.

Hedychrum species

Station 12; 11 August; on *Hela*.

Chrysura densa (Cresson)

Station 4, 6, 7, 12, and general area; 11 June to 14 August; sweeping *Erum* and *Phle*.

Chrysura pacifica (Say)

Station 7 and general area; 19 June to 28 June; on *PENS*, *Pifl*, and *Ptte*.

Chrysura smaragdicolor Walker

General area; 15 July; on *Chdo*.

Chrysura species

Unidentified specimens of this genus were recovered singly from stick trap in which the following bees were nesting: *Anthocopa* species, station 12; *Hoplitis* species, station 1; *Osmia* (*Nothosmia*) *kincaiidi* Cockerell, station 6; *Osmia* species, station 6.

Trichrysis doriae Gribodo

Station 12; 11 August; Malaise trap.

Chrysis coerulans Fabricius

Station 6, 11, 12, and general area; 19 July to 16 August; on Chmi, Cica, and Pifl, Malaise trap.

Chrysis derivata du Buysson

Station 12; 11 August; Malaise trap.

Chrysis dorsalis Aaron

Station 2; 25 July; Malaise trap.

Chrysis pattoni Aaron

Station 12; 13 August; Malaise trap.

Chrysis praestans du Buysson

Station 11; 14 July; on pahoehoe lava.

Chrysis rivalis Bohart

Station 12; 20 June; on ground.

Chrysis snowi Viereck

Station 12; 18 July; sweeping streamside vegetation.

Cleptes provancheri Aaron

Station 2; 23 July; Malaise trap.

Cleptes purpuratus Cresson

Station 2; 1 August; on foliage of SALI.

Family Bethylidae

Perisierola cellularis (Say)

Station 2 and general area; 19 July to 4 August; sweeping Chmi and Phle 2.

Family Tiphiidae

Tiphia nevadana Cameron

Station 11; 16 July; Malaise trap.

Tiphia species

Station 11; 17 July to 19 July; Malaise trap.

Paratiphia species

General area; 11 August to 5 September; sweeping Chna, Chvi, and Hela.

Brachycistis crassa Bradley

General area; 28 July; attracted to white light.

Brachycistis glabrella (Cresson)

Station 12; 20 June; attracted to black light trap.

Brachycistis semiatra Malloch

General area; 28 July; attracted to white light.

Family Sierolomorphidae

Sierolomorpha nigrescens Evans

General area; 15 June; sweeping Chna.

Family Mutillidae

Sphaeropthalma (Photopsis) ferruginea (Blake)

General area; 14 July; attracted to black light trap.

Sphaeropthalma (Photopsioides) contracta (Blake)

Station 12; 5 July; sweeping streamside vegetation.

Sphaeropthalma (Micromutilla) difficulis (Baker)

General area; 14 July; attracted to black light trap.

Odontophotopsis pudica (Melander)

Station 2 and 12; 11 July to 13 August; on Erov, Malaise trap.

Dasymutilla californica (Radoszkowski)

Station 11; 19 July to 21 July; Malaise trap.

Dasymutilla californica variety clio (Blake)

General area; 8 August; on ground.

Dasymutilla fulvohirta (Cresson)

Station 12 and general area; 11 August to 27 August; Malaise trap, on ground.

Family Sapygidae

Sapyga aculeata Cresson

Station 4, 5, 8, 12, and general area; 3 July to 18 July; on Acla and Phle.

Specimens were reared from nests of Hoplitis (Chlorosmia) fulgida fulgida (Cresson) in stick traps at stations 4 and 8.

Sapyga coloradensis Cresson

Station 12; 18 July; sweeping plant foliage.

Sapyga montana Cresson

Station 12; 20 June; on ground.

Sapyga pumila Cresson

Specimens of this species were recovered from nests of Hoplitis (Alcidamea) producta (Cresson) subspecies ?, at station 9, and Osmia species at stations 6 and 8.

Family Formicidae

Myrmica (Myrmica) lobicornis fracticornis Emery

General area; 22 June to 22 August; on foliage of Basa, on branches of Pifl, on foliage of Prte.

Myrmica (Myrmica) species

Station 1 and 12; 27 August to 5 September; on ground, sweeping streamside vegetation.

Pogonomyrmex (Pogonomyrmex) occidentalis owyheei Cole

Station 11; 31 August; on foliage of Chvi.

Aphaenogaster (Attomyrma) subterranea valida WHeeler

Station 4, Visitors Center and Residential area; 17 July to 28 August; near garbage cans, in fly trap.

Solenopsis (Diplorhoptrum) molesta validuscula Emery

Station 4; 23 August; nest in roots of Erum.

Leptothorax (Myrafant) nevadensis eldoradensis Wheeler

Station 4 and general area; 22 June to 13 August; on Artr, Basa, Pifl, sweeping shrub foliage.

Leptothorax (Myrafant) rugatulus rugatulus Emery

Station 6 and general area; 5 July to 30 August; on Putr, in ground.

One nest containing approximately 75 specimens was found in the roots of a dead Putr plant imbedded in the cinders.

Camponotus (Camponotus) herculeanus modoc Wheeler

Station 2, 3, 11, and 12; 20 June to 1 September; on Basa, Elco, Potr, Potr 2, Psgl, and Sese.

One nest of approximately 1,000 specimens was found in a rotting Psgl log, 40 cm diameter, in a densely shaded, northern exposure. A relationship was oberved between this species and an unidentified species of Aphididae on stems of Sese just below the flowers.

Camponotus (Camponotus) laevigatus (F. Smith)

Station 6, Visitors Center and Residential area, and general area; 21 June to 11 August; on Chna and Pifl.

One nest of approximately 50 Specimens was found in an one year dead Pifl log, 30 cm diameter, on a bare, eastern cinder slope.

Camponotus (Tanaemyrmex) vicinus Mayr

Station 12 and general area; 23 June to 11 August; on Phle and Potr, Malaise trap.

Lasius (Lasius) niger (Linnaeus)

Station 6, 9, and general area; 22 June to 17 September; on Artr, Chna, Jusc, Pifl, Berlese roots of Ptte, fly trap, under rocks.

Approximately 200 specimens were attracted to a fly trap baited with rotten meat. This species was always found in a boreal habitat in shaded exposures.

Formica (Proformica) lasiodes Emery

Station 6, 11, 12, and general area; 29 June to 29 August; on Chna, seedheads of Elco, on Hela, Meof, and Veth, Malaise trap.

Formica (Formica) fusca Linnaeus

Station 3, 8, 10, 12, and general area; 17 June to 17 September; on Artr, Chmi, Berlese flowers of Chna, on Cost, Cica, Mela, Phle, and Rice, on dead mule deer, Malaise trap.

One nest was found in cinder under a clump of dead Artr. Several specimens were observed attending an unidentified species of Aphididae on Artr.

Formica (Formica) hewitti Wheeler

Station 11; 9 July; small nest under 10 cm rock.

Formica (Formica) integroides coloradensis Wheeler

Station 10 and Grassy Cone; 26 June to 29 August; on Chmi and Chvi, on ground.

One large nest was observed on the south slope of Grassy Cone, on an open esposure. This nest was built up into a mound of small twigs. The area immediately surrounding the nest was void of vegetation, producing a clearing of approximately 2 meters in diameter.

Formica (Formica) integroides planipilis Creighton

General area; 17 June to 12 September; on Basa, Pifl. One large nest was found in a 30 cm diatmeter rotten Pifl log in a heavily shaded, moist habitat.

Formica (Formica) manni Wheeler

Station 2, 3, 4, 8, 10, and general area; 20 June to 4 September; on Basa, Chmi, Chna, Chvi, Crac, Berlese plants of Erum, on Hean, Hodi, Luca, Mela, Meof, PENS, Phle, Phle 2, Ptte, Putr, and Sese, in cinder.

One nest was approximately 5 cm under the surface of cinder soil and contained approximately 35 pupae and adults. One worker ant was observed dragging a dead specimen of the tingid bug Corythucha immaculata Osborn and Drake toward its nest at station 3.

Formica (Formica) neorufibarbis neorufibarbis Emery

Station 11, 12, Visitors Center and Residential area, and general area; 7 March to 20 August; on Alte, Chmi, Cost, Hean, Luca, and Rowo, Malaise trap.

Several specimens were collected with an unidentified species of Aphididae on small branches of Alte.

Formica (Formica) haemorrhoidalis Emery

General area; 22 June to 14 August; on Artr.

Formica (Formica) rasilis Wheeler

Station 2, 12, and general area; 22 June to 10 August; on LUPI and Pifl, on ground.

One worker was observed dragging a dead specimen of Euphydryas anicia (Doubleday) subspecies ? (Nymphalidae) toward its nest on Sunset Cone. A relationship was observed between this species and an unidentified species of Aphididae on the upper stems of LUPI.

Formica (Formica) rufa group

Station 7; 19 August; on Chna.

Seven minor workers were collected on the upper stems of Chna.

Formica (Formica) subpolita camponoticeps Wheeler

Station 3, 4, and general area; 17 August to 10 September; on Chna, Malaise trap, on dead mule deer.

Formica (Formica) species

Station 2, 3, 4, 12, and general area; 22 June to 10 August; on Basa, Cost, Erov, and Hean.

One winged male was prey of a specimen of Cyrtopogon inversus Curran (Asilidae) while resting on a dead Potr log. Two specimens were captured in copitu (10 August) while resting on a dead Potr.

Formica (Formica) whymperi alpina Wheeler

Station 6; 30 August; under Putr.

One small nest containing approximately 35 specimens was observed in cinder under a dead Putr shrub.

Polyergus rufescens breviceps Emery

Station 3; 25 August; Malaise trap.

Superfamily Vespoidea

Families have been divided according to the classification proposed by Richards (1962).

Family Masaridae

Pseudomasaris edwardsii (Cresson)

Station 1, 2, 4, 11, 12, and general area; 28 June to 12 August; sweeping seedheads of Elco, on flowers of Erov and Phle, Malaise trap.

Pseudomasaris vespoides (Cresson)

Station 11, 12, and general area; 3 July to 28 July; on flowers of PENS and Phle.

Pseudomasaris zonalis (Cresson)

Station 6, 12, and general area; 21 June to 17 July; on flowers of Erov and Phle, sweeping Pifl and Putr.

Family Eumenidae

Eumenes crucifera crucifera Provancher

Station 12; 1 August to 22 August; on flowers of Hela and Sese.

Eumenes iturbide pedalis Fox

Station 1; 11 August; sweeping Hela.

Eumenes verticalis coloradensis Cresson

Station 2, 12, and general area; 28 June to 22 August; sweeping Chmi and Sese, Malaise trap.

Euodynerus auranus (Cameron)

Station 11 and general area; 18 July to 9 August; on flowers of Chmi and Erum.

Euodynerus discogaster (Bequaert)

Station 11 and 12; 20 June to 5 July; on Erov, sweeping meadow grasses.

Euodynerus exoglyphus albovittatus (Bohart)

Station 10 and general area; 5 July to 8 July; in flight.

Euodynerus foraminatus foraminatus (Saussure)

Station 1 and 12; 19 June to 13 August; Malaise trap.

Euodynerus leucomelas (Saussure)

Station 7, 8, 11, and general area; 11 June to 14 July; on flowers of Erov, Erum, LUPI, and Pede.

Euodynerus tempiferus eldoradensis (Rohwer)

General area; 19 June; sweeping Cost.

Ancistrocerus adiabatus (Saussure)

Station 6; 24 August; sweeping Chna.

Ancistrocerus antilope antilope (Panzer)

General area; 27 June; sweeping Cost.

Ancistrocerus catskill albophaleratus (Saussure)

Station 2, 7, 11, 12, and general area; 20 June to 27 August; on Acla, Chmi, Chna, Chvi, Cica, Erov, Hela, Rowo, SALI, Sese, and XANT.

Ancistrocerus catskill catskill (Saussure)

Station 1, 2, 4, 9, 12, and general area; 19 June to 14 September; on Chna, Cica, Cost, Erov, Hela, Pifl, Potr 2, Rowo, and Sese.

One pair were flying in copulation on 14 July at station 2. One male was found with a male puparium of a Strepsipteran, Pseudoxenos species.

Ancistrocerus lineativentris lineativentris Cameron

Station 2, 4, 6, 12, and general area; 8 August to 24 August; sweeping Chna and Hela, Malaise trap.

Ancistrocerus spilogaster Cameron

Station 12 and general area; 30 June to 14 June; on Sese and XANT, in flight.

Symmorphus cristatus cristatus (Saussure)

Station 12; 1 August to 11 August; on flowers of Hela.

Stenodynerus cochisensis (Viereck)

Station 2; 25 July; Malaise trap.

Stenodynerus kennicottianus kennicottianus (Saussure)

Station 12; 13 August; Malaise trap.

Stenodynerus species

Station 12 and general area; 28 July; on PENS, in stick trap.

Parancistrocerus acarigaster Bohart

General area; 18 June; on foliage of Pifl.

Parancistrocerus vagus vagus (Saussure)

Station 12; 11 August; sweeping Hela flowers.

Parancistrocerus species

Station 7, 11, and general area; 27 June to 11 September; sweeping Chmi, on flowers of Erov and Erum, Malaise trap.

Maricopodynerus rudiceps Bohart

Station 4, 7, 8, 11, and general area; 8 July to 21 August; sweeping Chna and Erum.

Pterocheilus (Megapterocheilus) decorus leucotaenius Rohwer

General area; 12 July; in flight.

Family Vespidae

Vespula (Vespula) atropilosa (Sladen)

General area; 8 August; on ground.

Vespula (Vespula) pennsylvanica (Saussure)

Station 12 and general area; 19 June to 27 August; sweeping Potr 2, Malaise trap.

Vespula (Dolichovespula) arenaria (Fabricius)

Station 2, 12, and general area; 23 June to 27 August; sweeping Potr, Malaise trap.

Vespula (Dolichovespula) artica Rohwer

Station 12; 27 August; sweeping Potr 2.

Vespula (Dolichovespula) maculata (Linnaeus)

Station 12; 30 June to 27 August; sweeping Potr 2, in flight.

Polistes fuscatus aurifer Saussure

Station 4, 7, 12, and general area; 11 June to 4 September; on Chmi, Chna, ERIO, Pifl, Ptte, Rowo, and Trre, Malaise trap.

One male was found under the loose bark of a dead standing Pifl on 4 September. The tree was laocated on a southern open exposure.

Family Pompilidae

Chirodamus pyrrhomelas (Walker)

Station 12 and general area; 18 July to 27 August; sweeping Potr 2 and Rowo.

Priocnemis (Myrmecosalius) notha occidentis Banks

Station 12; 13 August; Malaise trap.

Auplopus architectus metallicus Banks

Station 12; 11 August to 13 August; Malaise trap.

Ageniella (Ageniella) blaisdelli (Fox)

Station 12; 13 August; Malaise trap.

Ageniella (Ageniella) euphorbiae (Viereck)

Station 3 and 11; 16 July to 24 August; Malaise trap.

Ceropales maculata stretchii Fox

Station 11; 15 July; on meadow grasses.

Aporus (Aporus) luxus luxus (Banks)

General area; 13 August; Malaise trap.

Evagetes padrinus padrinus (Viereck)

General area; 19 August to 4 September; on rocks.

Evagetes subangulatus (Banks)

Station 1, 12, and general area; 5 July to 11 August; sweeping Hela, Malaise trap.

Episyron biguttatus californicus Banks

Station 1, 2, and 12; 27 June to 18 August; on flowers of Cica and Hela, Malaise trap.

Episyron oregon Evans

Station 2 and 9; 22 June to 25 July; Malaise trap.

Episyron quinquenotatus hurdi Evans

General area; 5 July to 13 August; on flowers of Acla and Hela, Malaise trap.

Tachypompilus unicolor unicolor (Banks)

Station 12 and general area; 1 August to 5 August; sweeping Chmi, Chna, and Hela, on ground.

Anoplius (Arachnophroctonus) relativus (Fox)

Visitors Center area; 29 July; on flowers of Trre.

Anoplius (Pompilinus) insolens (Banks)

Station 11; 16 July; Malaise trap.

Anoplius (Pompilinus) tenebrosus (Cresson)

Station 2, 11, and 12; 27 June to 13 August; on Erov, Malaise trap.

Anoplius (Anoplius) dreisbachi Evans

Station 3; 24 August; Malaise trap.

Pompilus (Ammosphex) angularis (Banks)

Station 9; 23 June; Malaise trap.

Pompilus (Ammosphex) imbecillus imbecillus (Banks)

Station 2; 25 July; Malaise trap.

Pompilus (Arachnospila) arctus (Cresson)

Station 2, 8, 11, 12, and general area; 20 June to 28 August; Malaise trap, on ground.

One male was prey to the spider Misumena vatia (Clerck)(Thomisidae) on flowers of Sese.

Pompilus (Arachnospila) scelestus Cresson

Station 2, 11, and 12; 5 July to 11 August; on Hela, Malaise trap.

Aporinellus completus Banks

Station 12; 11 August; Malaise trap.

Aporinellus fasciatus (Smith)

Station 2; 25 July; Malaise trap.

Family Sphecidae

Astata bechteli Parker

Station 8 and 11; 16 July; Malaise trap.

Astata leuthstromi Ashmead

Station 6 and 12; 18 July to 24 August; on Chna, on ground.

Astata nubecula Cresson

Station 1 and 12; 18 July to 8 August; sweeping Hela.

Astata occidentalis Cresson

Station 12; 11 August; Malaise trap.

Dryadella aspera (Fox)

Station 12 and general area; 18 July to 11 September; on Acla and Chna, Malaise trap.

Dryudella caerulea (Cresson)

Station 11 and 12; 15 July to 18 July; on Erum, sweeping streamside vegetation.

Dryudella montana (Cresson)

Station 12; 18 July; sweeping streamside vegetation.

Solierella species

Station 1; 1 August; on ground.

Tachytes (Tachytes) fulviventris fulviventris Cresson

General area; 2 August; sweeping Chvi.

Tachytes (Tachytes) nevadensis Bohart

Station 4, 12, and general area; 1 August to 25 August; on flowers of Chmi, Chna, Chvi, Hela, and Trre, on ground.

Tachytes (Tachytes) sayi Banks

General area; 25 August; on Chmi.

Tachytes (Tachytes) spatulatus Fox

Station 1 and 12; 1 August to 22 August; on flowers of Hela and Sese.

Larropsis capax (Fox)

Station 12 and general area; 13 August to 8 September; Malaise trap, on pahoehoe lava.

Tachysphex aequalis Fox

Station 12; 11 August; Malaise trap.

Tachysphex aethiops Cresson

Station 4 and 12; 9 July to 1 August; in flight.

Tachysphex montanus (Cresson)

Station 3 and 12; 11 August to 23 August; Malaise trap.

Tachysphex tarsatus (Say)

Station 2, 3, 11, and 12; 16 July to 27 August; Malaise trap.

Tachysphex terminatus (Smith)

Station 2, 9, and 12; 22 June to 13 August; Malaise trap.

Tachysphex species

Station 1; 1 August; on flowers of Hela.

Trypoxylon (Trypoxylon) pennsylvanicum Saussure

Station 1; 1 August; on ground.

Trypoxylon (Trypoxylon) sculleni Sandhouse

General area; 7 July; sweeping plant foliage.

Trypoxylon species

Station 7; summer; in stick trap.

Mimesa gregaria (Fox)

General area; 25 August; on Chmi.

Mimesa species

Station 12; 13 August; Malaise trap.

Mimumesa mixta (Fox)

Station 2; 26 July; Malaise trap.

Xylocelia species

Station 12; 27 August; sweeping Potr 2.

Passaloecus mandibularis (Cresson)

Station 11; 12 July; Malaise trap.

Spilomena species

Station 10; 9 August; sweeping Chmi.

Sceliphron caementarium Drury

Station 2, 4, and 12; 21 July to 27 August; sweeping Potr 2, on ground.

Sphex ichneumoneus (Linnaeus)

Station 12 and general area; 2 August to 14 August; on flowers of Chvi, Sese, and XANT.

Fernaldina lucae (Saussure)

Station 6; 16 July; on flowers of Erum.

Palmodes hesperus Bohart and Menke

Station 2, 3, 12, and general area; 1 July to 13 August; on Sese, Malaise trap.

Prionyx atratus (Lepeletier)

General area; 26 July to 23 August; on flowers of Acla, Chna, and Trre.

Prionyx canadensis (Provancher)

Station 2, 3, 4, 12, and general area; 28 June to 24 August; on flowers of Acla, Chna, Chvi, Sese, and Trre, attracted to black light trap, Malaise trap.

Podalonia communis (Cresson)

Station 6, 12, and general area; 20 June to 24 August; on Chna and Trre, Malaise trap.

Podalonia luctuosa (Smith)

Station 6, 11, 12, and general area; 20 June to 25 August; on Acla, Chmi, Erov, Sese, and Trre, Malaise trap.

Podalonia mexicana (Saussure)

Station 12 and general area; 29 July to 25 August; on flowers of Chmi, Sese, and Trre.

Podalonia occidentalis Murray

Station 3, 7, 11, 12, and general area; 11 June to 21 August; on Acla, Asca, Chna, Erov, Pifl, Prvi, Putr, and Trre, Malaise trap.

Podalonia sericea Murray

Station 2 and 12; 5 July to 11 August; on Phle, Malaise trap.

Ammophila azteca Cameron

Station 2, 11, 12, and general area; on Artr, Chvi, ERIO, and Erum, Malaise trap.

Ammophila dysmica Menke

Station 2 and 11; 28 June to 23 July; on Erov, Malaise trap.

Ammophila extremitata ? Cresson

Station 2 and general area; 13 July to 10 August; on Chvi, Malaise trap.

Ammophila juncea Cresson

Station 4 and general area; 10 August to 17 August; on flowers of Chna and Chvi.

Ammophila kennedyi (Murray)

Station 12; 21 June to 13 August; on Asca and Sese, Malaise trap.

Ammophila macra Cresson

Station 1, 2, 11, 12, and general area; 14 July to 5 September; on Chna, Erum, Hela, Sese, and XANT, Malaise trap.

Ammophila mediata Cresson

Station 3 and 12; 14 July to 19 August; Malaise trap, on cinder.

A female of this species, 18 mm in length, was observed with a paralyzed Noctuidae larva, 22 mm in length, just south of the horse pasture at station 2. She held the caterpillar with her mandibles and dragged it between her legs over the cinder surface.

Ammophila parkerii Menke

Station 12; 20 June; on ground.

Ammophila procera Dahlbom

Station 12 and general area; 5 July to 13 August; on flowers of Sese and Trre, Malaise trap.

Ammophila stangei Menke

Station 4 and 11; 3 July to 5 July; on flowers of Erum and Mina.

Ammophila strenua Cresson

Station 2 and 12; 23 July to 13 August; Malaise trap.

Zanysson texanus (Cresson)

General area; 2 August; on flowers of Chvi.

Dienoplus pictifrons Fox

Station 9; 23 June; Malaise trap.

Arigorytes smohalla Pate

Station 11; 14 July; in flight.

Lestiphorus piceus (Handlirsch)

Station 2, 3, and 11; 17 July to 25 August; Malaise trap.

Psammaecius (Hoplisoides) qulielmi (Viereck)

Station 12; 1 August; sweeping flowers of Hela.

Gorytes (Gorytes) albosignatus Fox

Station 2, 9, 11, 12, and general area; sweeping flowers of Cost and Hela, Malaise trap.

Gorytes (Gorytes) angustus (Provancher)

Station 11 and 12; 11 July to 1 August; on flowers of Hela, Malaise trap.

Gorytes (Gorytes) provancheri Handlirsch

Station 11 and 12; 9 July to 27 August; sweeping Potr 2, Malaise trap.

Gorytes (Gorytes) simillimus Smith

Station 12; 13 August; Malaise trap.

Stizoides unicinctus (Say)

General area; 1 August to 11 August; on flowers of Hela and Trre.

Steniolla obliqua (Cresson)

Station 2, 6, 12, and general area; 15 July to 27 August; on Chdo, Chna, and Pifl, Malaise trap.

Stictiella emarginata (Cresson)

Station 11 and 12; 12 July to 11 August; on Chdo, Malaise trap.

Stictiella megacera Parker

General area; 25 August; on Chmi.

Bembix spinolae Lepeletier

Geneneral area; 29 July to 21 August; on flowers of Chna and Trre, on ground.

Bembix amoena Handlirsch

Station 2, 4, 8, 12, and general area; 16 July to 21 August; on Chna and Trre, Malaise trap.

Philanthus anna Dunning

General area; 15 July; on ERIO.

Philanthus crabroniformis F. Smith

General area; 12 July to 22 August; on flowers of Acla, Sese, and XANT.

Philanthus politus pacificus Cresson

Station 11 and general area; 18 June to 9 July; on flowers of Erde and Erov.

Philanthus politus group

General area; 28 June to 15 July; on flowers of ERIO and Erov.

Aphilanthops (Aphilanthops) subfrigidus Dunning

Station 11, 12, and general area; 9 July to 13 August; on ERIO, Malaise trap.

Cerceris californica californica Cresson

General area; 28 July to 25 August; on Chmi.

Cerceris convergens Viereck and Cockerell

General area; 2 August to 8 August; sweeping Chmi and Chna.

Cerceris nigrescens nigrescens F. Smith

Station 12 and general area; 13 July to 11 August; on Acla and Sese.

Eucerceris flavocincta Cresson

Station 11; 14 July to 15 July; on ERIO, on ground.

One female was seen entering a nest in the ground carrying the weevil Acmaegenius granicollis Van Dyke. She had flown to her nest, carrying the weevil between her prothoracic and mesothroacic legs.

Crabro (Crabro) latipes Smith

Station 2, 9, 12, and general area; 19 June to 11 September; on Cost, Pifl, and Rowo, Malaise trap.

Crossocerus species

Station 2, 12, and general area; 27 June to 1 September; on Chna, Cost, Pifl, and Potr.

Stictoptila confertus (Fox)

Station 12 and general area; 20 June to 13 August; Malaise trap, on ground.

Ectemnius (Protothyreopus) dilectus dilectus (Cresson)

Station 7, 12, and general area; 18 June to 14 August; on Hela, POTE, SALI, and Sese.

Ectemnius (Hypocrabro) arcuatus (Say)

General area; 18 July; on Acla.

Ectemnius (Hypocrabro) spiniferus (Fox)

Station 12 and general area; 1 August to 6 September; on Chmi, Chna, Hean, and Hela, Malaise trap.

Ectemnius (Hypocrabro) trifasciatus (Say)

Station 1 and 11; 5 July; sweeping Hela.

Ectemnius (Ectemnius) atriceps (Cresson)

Station 11; 5 July; sweeping plant foliage.

Ectemnius (Ectemnius) dives (Lepeletier and Brulle)

Station 11; 5 July; sweeping plant foliage.

Lestica (Solenius) interrupta interrupta (Lepeltier and Brulle)

Station 11 and 12; 5 July to 1 August; sweeping Hela.

Belomicrus forbesii forbesii (Robertson)

General area; 5 July; sweeping flowering Meof.

Oxybelus argenteopilosum Cameron

Station 11 and general area; 7 July to 25 August; on Chmi and Sese, Malaise trap.

Oxybelus emarginatus Say

Station 2, 9, 11, and general area; 22 June to 10 August; on flowers of Acla, Chvi, and ERIO, Malaise trap.

Oxybelus quadrinotatus Say

Station 12 and general area; 4 August to 11 August; on flowers of Hela, attracted to black light trap.

Oxybelus similis Cresson

General area; 28 June; on flowers of Erov.

Family Colletidae

Colletes consors pascoensis Cockerell

General area; 30 June to 3 July; in flight.

Colletes fulgidus fulgidus Swenk

Station 12 and general area; 21 August to 6 September; sweeping Chna and Sese.

Colletes kincaidii Cockerell

General area; 25 August; on Chmi.

Colletes phaceliae Cockerell

General area; 29 June to 13 September; sweeping Chna.

Hylaeus (Hylaeus) ellipticus (Kirby)

Station 12; 20 June; on ground.

Hylaeus (Hylaeus) rudbeckiae (Cockerell and Casad)

Station 2, 8, 11, and general area; 7 July to 6 September; on Artr, Chna, Erum, Hela, and Sese.

Hylaeus (Hylaeus) verticalis (Cresson)

General area; 3 July; on Phle.

Hylaeus (Paraprosopis) coloradensis (Cockerell)

Station 12; 1 August to 14 August; on flowers of Hela and Sese.

Hylaeus (Paraprosopis) species nova ms Snelling

Station 2, 4, 6, 11, and general area; 3 July to 5 September; on Chmi, Chna, Erov, Phle, Potr, and Sese.

One male was found to be stylopized by an unidentified Strepsipteran. Two specimens were prey of Phymata pennsylvanica Handerlirsch (Phymatidae) while visiting the flowers of Chna.

Hylaeus (Prosopis) rugulosus episcopalis (Cockerell)

Station 11 and general area; on flowers of Chmi, and Erum, Malaise trap.

Hylaeus species

Station 2, 4, and 10; summer; in stick traps.

A specimen of Anthrax irroratus Say (Bombyliidae) was found in a nest of this bee.

Family Andrenidae

Andrena (Cnemidandrena) colletina Cockerell

General area; 17 August to 5 September; on flowers of Chna.

Andrena (Cnemidandrena) surda Cockerell

General area; 11 August to 6 September; on flowers of Chna and Sese.

Andrena (Cryptandrena) transnigra transnigra Viereck

Station 12 and general area; 20 June to 18 July; on PENS, Prvi, and Sese.

One female was prey to a spider Misumena vatia (Clerck) (Thomisidae) on flowers of Sese.

Andrena (Elandrena) chapmanae Viereck

Station 7, 8, and general area; 18 June to 29 June; on flowers of Erde and Phle.

Andrena (Opandrena) cressoni Robertson

General area; 15 July; on ERIO.

Andrena (Schizandrena) prunorum kincaidii Cockerell

General area; 6 July to 25 August; on Chmi, ERIO, and Erov.

Andrena (Thysandrena) knuthiana Cockerell

General area; 15 July; on ERIO.

Andrena (Thysandrena) w-scripta Viereck

General area; 24 June; sweeping Cost.

Andrena (Trachandrena) cleodora (Viereck)

General area; 28 June; sweeping plant foliage.

Andrena (Trachandrena) species

General area; 7 July; on flight.

Perdita aemula Timberlake

General area; 11 August to 12 September; on Chna.

Perdita wyomingensis segona Timberlake

General area; 15 July; on ERIO.

Nomadopsis scutellaris scutellaris (Fowler)

Station 2; 26 July; Malaise trap.

Family Halictidae

Halictus (Halictus) farinosus Smith

General area; 25 August; on Chmi.

Halictus (Halictus) rubicundus (Christ)

Station 3, 11, 12, and general area; 26 June to 22 August; on Basa, Erum, and Sese.

Halictus (Seladonia) tripartitus Cockerell

Station 1, 11, and 12; 20 June to 27 August; on Chmi, Chvi, Cica, ERIO, Ruoc, Sese, and XANT, Malaise trap.

Lasioglossum (Lasioglossum) sisymbrii (Cockerell)

Station 4, 11, 12, and general area; 27 June to 12 September; on flowers of Chna, Erov, Hela, Sese, and XANT.

Lasioglossum (Lasioglossum) trizonatum (Cresson)

General area; 3 July to 1 September; on flowers of Chna, Cica, and Mela.

Lasioglossum (Evylaeus) cooleyi (Crawford)

Station 12 and general area; 2 August to 25 August; on flowers of Chmi, Chna, Chvi, Sese, and XANT.

Lasioglossum (Evylaeus) ruficorne (Crawford)

Station 12 and general area; 18 July to 30 August; on Chmi, Chna, Chvi, Hela, and Sese.

Lasioglossum (Evylaeus) species

Station 12 and general area; 11 August to 14 August; on Asca, Chvi, and Sese.

Dialictus actinosum (Sandhouse)

General area; 24 June to 12 September; on Chmi, Chna, and Cost.

Dialictus albohirtum (Craeford)

General area; 15 July to 12 September; on Chna and ERIO.

Dialictus incompletum (Crawford)

General area; 12 September; on flowers of Chna.

Dialictus species near petrellum (Cockerell)

General area; 21 August; on flowers of Chna.

Dialictus species A

Station 12; 12 August to 22 August; on flowers of Asca, Cica, Ruoc, and Sese.

Dialictus species B

Station 12; 14 August; on Sese, in flight.

Dialictus species C

Visitors Center and Residential area; 4 August; attracted to white light.

Dialictus species D

General area; 7 July; sweeping mixed shrubs.

Dialictus species E

Station 12 and general area; 4 July to 21 August; on Chna, Chvi, Crac, Rowo, and Sese.

Dialictus species F

General area; 11 August; sweeping flowering Chvi.

Sphecodes arvensiformis Cockerell

Station 1 and 12; 1 August to 22 August; on flowers of Hela and Sese.

Sphecodes species A

Station 12; 11 August; sweeping Hela.

Sphecodes species B

Station 12; 11 August to 22 August; on flowers of Hela and Sese.

Agapostemon cockerelli Crawford

Station 11 and general area; 27 June to 12 September; on flowers of Chna and POTE.

Agapostemon texanus texanus Cresson

Station 3, 11, 12, and general area; 13 June to 12 September; on flowers of Basa, Chmi, Chna, Cica, Cost, Oprh, Phle, POTE, and Wyam, Malaise trap.

Dufourea (Halictoides) trochantera Bohart

Station 2, 10, 12, and general area; 13 June to 8 July; on flowers of Cica and Phle.

Dufourea (Halictoides) versatilis versatilis (Bridwell)

Station 2; 14 July; sweeping mixed shrubs.

Family Megachilidae

Lithurge (Lithurgopsis) apicaulis apicaulis (Cresson)

General area; 12 July; on flowers of Phle.

Anthidium (Anthidium) emarginatum (Say)

Station 1, 6, 7, 11, 12, and general area; 18 June to 18 July; on flowers of Erov, Erum, Hela, and Phle, Malaise trap.

Anthidium (Anthidium) placitum placitum Cresson

Station 2, 7, and 11; 8 July to 16 July; on flowers of Erum.

Anthidium (Anthidium) tenuflorae tenuiflorae Cockerell

Station 2, 4, 6, 7, 8, 9, and 11; 19 June to 24 August; on Erum and LUPI, Malaise trap, on pahoehoe lava.

Anthidium (Anthidium) utahense Swenk

Station 11; 15 July; in flight.

Anthidium species

One nest of this species was recorded from a stick trap set in the ground at station 10. An unidentified Meloidae was found in the nest also.

Callanthidium formosum (Cresson)

Station 11; 12 July to 17 July; on Phle, Malaise trap.

Dianthidium subparvum subparvum Swenk

Station 4; 17 August; on flowers of Chna.

Dianthidium ulkei perterritum Cockerell

Station 6; 24 July; on Chna.

Dianthidium ulkei ulkei (Cresson)

Station 4; 17 August; on flowers of Chna.

Anthidiellum notatum robertsoni (Cockerell)

Station 6 and general area; 25 August to 4 September; on Asca, Chmi, and Chna.

Stelis (Pavostelis) montana Cresson

Station 2, 4, and 11; 14 July to 17 August; on Artr, Chmi, and Chna.

Stelis (Chelynia) subcaerulea (Cresson)

Station 1; 1 August; on ground.

Stelis (Chelynia) subemarginata (Cresson)

Station 11; 5 July to 9 July; on Erum.

Stelis species

Specimens of this genus were found in nests of bees in stick traps. They were found associated with the following species: Hoplitis (Chlorosmia) fulgida fulgida (Cresson) at station 3, 9, and 10; Hoplitis (Cyrtosmia) hypocrita (Cockerell) at station 3, 4, and 5; Hoplitis (Alcidamea) producta producta (Cresson) at station 1, 6, and 9; Osmia (Nothosmia) kincaidii Cockerell at station 3 and 10.

Dioxys aurifusca (Titus)

Station 7 and general area; 3 July to 13 July; on ground.

Dioxys pomonae pomonae Cockerell

General area; 3 July; on flowers of Phle.

Chelostoma phaceliae Michener

Station 2 and general area; 7 July to 25 August; on flowers of Chmi, in flight.

Chelostoma species

Station 2 and 8; summer; in stick trap.

Ashmeadiella (Ashmeadiella) bucconis denticulata (Cresson)

General area; 21 August; on flowers of Chna.

Ashmeadiella (Ashmeadiella) californica californica (Ashmead)

General area; 28 June to 12 September; on flowers of Chna and PENS.

Ashmeadiella (Arogochila) timberlakei timberlakei Michener

General area; 28 July; on flowers of Acla.

Ashmeadiella species nova

General area; 28 June to 3 July; on flowers of Pede, PENS, Phle, and Rowo.

Hoplitis (Alcidamea) producta producta (Cresson)

Station 2, 6, 9, and 10; summer; in stick traps.

Several immature parasitoids were recovered from nests of this species including a specimen of Stelis species (Megachilidae) at station 2, 6, 9, and 10, a specimen of Sapyga pumila Cresson (Sapygidae) and one specimen of Anthrax irroratus Say (Bombyliidae) at station 9.

Hoplitis (Alcidamea) sambuci Titus

Station 1, 2, 3, 6, 11, and general area; 12 July; in flight, in stick traps.

Immature parasitoids were recovered from nests including a specimen of Stelis species (Megachilidae) at station 2, and an unidentified Meloidae at station 1, 2, and 6.

Hoplitis (Cyrtosmia) hypocrita (Cockerell)

Station 2, 3, 4, 5, 8, 11, 12, and general area; 25 June to 14 July; on flowers of Cica and Phle, Malaise trap, stick traps.

Several immature parasitoids were recovered from nests including specimens of Stelis species (Megachilidae) at station 3, 4, and 5, a specimen of Sapyga aculeata Cresson (Sapygidae) at station 4, 5, and 8, an unidentified Ichneumonidae at station 2, and an unidentified Meloidae at station 2, 3, 4, 5, and 8.

Hoplitis (Monumetha) alibfrons albifrons (Kirby)

Station 2, 9, 11, and general area; 12 June to 14 July; on flowers of Erum, Malaise trap.

Hoplitis (Monumetha) albifrons argentifrons (Cresson)

Station 6 and general area 26 June to 17 July; on Pifl, in flight.

Hoplitis (Chlorosmia) fulgida fulgida Cresson

Station 1, 2, 4, 6, 7, 8, 9, 10, 12, and general area; 19 June to 25 July; on flowers of Phle, Malaise trap, stick traps.

Several parasitoids were recovered from nests of stick traps and included Stelis species (Megachilidae) at station 4 and 8, Sapyga aculeata Cresson (Sapygidae) at station 4, an unidentified Ichneumonidae at station 4, and an unidentified Meloidae at station 2 and 9. Stick traps at station 1, 6, 7, and 12 were free from parasitoids.

Hoplitis (Chlorosmia) louisae (Cockerell)

Station 2, 6, 7, 8, 11, and general area; 18 June to 17 July; sweeping Artr, on flowers of Erum and Phle, Malaise trap.

Hoplitis species

Station 1, 6, 8, 10, and 12; 27 June; on flowers of Cica, stick traps.

Parasitoids recovered from nests were Chrysura species (Chrysididae) at station 1, Anthrax irroratus Say (Bombyliidae) at station 10, and an unidentified Meloidae at station 1 and 10. Stick traps were free from parasitoids at station 6, 8, and 12.

Anthocopa (Atoposmia) triodonta tridonta (Cockerell)

General area; 29 June to 3 July; on flowers of Pede and Phle.

Anthocopa (Hexosmia) copelandica copelandica (Cockerell)

General area; 29 June to 3 July; on flowers of Pede and Phle.

Anthocopa species

Station 3, 5, 6, 7, 8, 11, and 12, summer; in stick traps.

One parasitoid, Chrysura species (Chrysididae), was found in a stick trap west of Station 12. Nests in stick traps were free from parasitoids at station 2, 5, 6, 7, 8, 9, and 11.

Osmia (Osmia) lignaria propingua Cresson

Station 12 and general area; 11 June to 5 July; on Phle.

Osmia (Chalcosmia) coloradensis Cresson

Station 12 and general area; 3 July to 13 August; on Phle, Malaise trap.

Osmia (Cephalosmia) marginipennis Cresson

Station 2, 6, 8, 10, 11, 12, and general area; 19 June to 16 July; on flowers of Chdo, Crac, Erum, LUPI, and Phle.

Osmia (Cephalosmia) montana Cresson

Station 12 and general area; 20 June to 3 July; on flowers of Cica, Phle, and POTE.

Osmia (Cephalosmia) pascoensis Cockerell

Station 8, 12, and general area; 19 June to 21 July; on flowers of Cica, Erde, and Lere.

Osmia (Cephalosmia) species

Station 9; 19 June; Malaise trap.

Osmia (Acanthosmioides) nigrifrons nigrifrons Cresson

Station 12 and general area; 20 June to 5 July; on Lere and Potr, in flight, in ground.

Several specimens of this bee were observed jointly excavating a short tunnel approximately 5 cm from the edge of Little Cottonwood Creek. They picked up small pieces of gravel with their mandibles during the excavation and flew out of sight with this material. Ten specimens were captured within ten minutes.

Osmia (Acanthosmioides) species

Station 6, 12, and general area; 20 June to 16 July; on Erum, on ground.

Osmia (Nothosmia) kincaidii Cockerell

Station 2, 9, and 11; summer; in stick traps.

Several parasitoids were taken from nests and included Stelis species (Megachilidae) at station 9 and 11, Chrysura species (Chrysididae) at station 2, and several unidentified Chalcidoidea at station 2.

Osmia (Chenosmia) indeprensa (Sandhouse)

Station 7, 11, and general area; 18 June to 6 July; on flowers of Erov, Pede, PENS, and Phle.

Osmia (Chenosmia) group I

Station 7, 8, 11, 12, and general area; 18 June to 9 July; on flowers of Basa, Chdo, Cica, Erde, Erum, Pede, and Phle.

One specimen was found dead on a leaf of Erum on 16 July.

Osmia (Chenosmia) group II

Station 2, 6, 8, 9, 11, 12, and general area; 19 June to 13 August; on Chmi, Cica, LUPI, Phle, SALI, and Trre, Malaise trap.

Osmia (Chenosmia) group III

Station 3, 11, 12, and general area; 13 June to 11 August; on Cica, Meof, and Rowo, Malaise trap.

Osmia (Chenosmia) group IV

Station 2, 8, and general area; 28 June to 23 July; on LUPI and Phle, Malaise trap.

Osmia (Chenosmia) species

Station 7, 12, and general area; 18 June to 3 July; on flowers of PENS, on ground.

Osmia (Monilosmia) group I

Station 7 and 8; 3 July to 8 July; on flowers of LUPI and Pede.

Osmia (Monilosmia) group II

Station 8, 11, 12, and general area; 3 July to 13 August; on LUPI, Meof, Pede, and Phle, Malaise trap.

Osmia (Monilosmia) species

General area; 23 June to 3 July; on Hela foliage, on flowers of Phle.

Osmia species

Station 6 and 12; summer; in stick traps.

The parasitoids, Chrysura species (Chrysididae) at station 6, and Sapyga pumila Cresson (Sapygidae) at station 6 and 12, were found in nests of this species.

Megachile (Litomegachile) texana cleomis Cockerell

General area; 29 July; in flight.

Megachile (Megachile) inermis Provancher

Station 12; 11 August to 5 September; on flowers of Civu.

Megachile (Delomegachile) gemula Cresson

Station 7; 18 June; on flowers of POTE.

Megachile (Xeromegachile) manifesta Cresson

General area; 12 September; on flowers of Chna.

Megachile (Xeromegachile) nevadensis Cresson

General area; 22 August to 12 September; on flowers of Chna and Sese.

Megachile (Xeromegachile) wheeleri Mitchell

Station 12; 16 August; on flowers of Ruoc.

Megachile (Argyropile) parallela parallela Smith

General area; 2 August; on flowers of Chna.

Megachile (Xanthosarus) perihirta Cockerell

Station 1, 2, 4, 6, 7, 11, and 12; 3 July to 1 September; on flowers of Chna, Erum, and LUPI, Malaise trap.

Megachile (Sayapis) pugnata pugnata Say

Station 6, 7, and general area; 3 July to 18 July; on flowers of Acla, Cica, Erum, and Phle.

Megachile species

Station 4; summer; in stick traps.

Several nests were found in stick traps without evidence of parasitoidism at station 4.

Coelioxys species

General area; 20 June to 18 July; on flowers of Basa and Sese.

Family Anthophoridae

Nomada species A

General area; 27 June; sweeping flowering Cost.

Nomada species B

General area; 15 July; on ERIO.

Epeolus (Epeolus) compactus Cresson

General area; 25 August; on Chmi.

Epeolus (Epeolus) mimimus (Robertson)

Station 7, 8, and general area; on flowers of Erum, on ground.

Triepeolus species

General area; 18 July; on flowers of Acla.

Diadasia australis australis (Cresson)

General area; 12 July; on flowers of Oprh and Phle.

Diadasia enavata (Cresson)

Station 10, 11, and general area; 16 July to 14 September; on flowers of Hela.

Melissodes agilis Cresson

General area; 2 August to 8 September; on flowers of Chna and Hela.

Tetralonia species

Grassy Cone; 17 June; on flowers of Basa.

Anthophora (Anthophora) affabilis Cresson

General area; 12 July; on flowers of Phle.

Anthophora (Anthophora) bomboides neomexicana Cockerell

Station 11; 8 July; in flight.

Anthophora (Anthophora) urbana urbana Cresson

Station 9, 11, 12, and general area; 2 June to 6 September; on flowers of Chna, Cica, Luca, Oprh, and Sese, Malaise trap.

Anthophora (Clisodon) furcatus terminalis Cresson

Station 12; 11 August; Malaise trap.

Anthophora (Micranthophora) flexipes Cresson

Station 4 and general area; 3 July to 17 August; on flowers of Chna and Phle.

Melecta (Melecta) pacifica Cresson

Station 12; 20 June; on ground.

Family Xylocopidae

Ceratina (Zadontomerus) nanula nanula Cockerell

General area; 6 September; on flowers of Chna.

Ceratina species

Station 2 and 12; summer; in stick traps.

Family Apidae

Bombus (Bombias) nevadensis nevadensis Cresson

Station 3, 6, 12, and general area; 13 June to 24 August; on flowers of Cica, Crac, and DELP.

Bombus (Separatobombus) morrisoni Cresson

General area; 25 June to 23 September; in flight.

Bombus (Cullumanobombus) rufocinctus Cresson

Station 2, 3, 6, 11, 12, and general area; 24 June to 3 August; on flowers of Acla, Chna, Chvi, Cica, Erum, Hela, Mela, Meof, PENS, Sese, and Trre, Malaise trap.

Bombus (Subterraneobombus) appositus Cresson

Station 12 and Visitors Center area; 30 June to 19 August; on Chna, Malaise trap.

Bombus (Fervidobombus) californicus F. Smith

Station 1 and 12; 27 June to 14 September; on flowers of Cica and Civu, Malaise trap.

Bombus (Fervidobombus) fervidus (Fabricius)

Station 2, 4, 8, 11, 12, and general area; 25 June to 24 August; on flowers of Chna, Cica, Erum, and Trre.

Bombus (Bombus) occidentalis occidentalis Greene

Station 1; 18 July; on Hela.

Bombus (Pyrobombus) bifarius nearcticus Handlirsch

Station 12 and general area; 18 July to 5 September; on flowers of Civu and Sese, Malaise trap.

One worker was prey to the spider Misumena vatia (Clerck)(Thomisidae) while visiting the flowers of Sese.

Bombus (Pyrobombus) centralis Cresson

Station 2, 4, 6, 11, 12, and general area; 22 June to 13 August; on branch of Artr, on flowers of Chmi, Chna, Chvi, Cica, Erum, LUPI, Phle, and Sese, Malaise trap.

Bombus (Pyrobombus) huntii Greene

Station 2, 3, 4, 6, 7, 8, 10, 11, 12, and general area; 13 June to 12 September; on flowers of Basa, Chmi, Chna, Chvi, Cica, Crac, Erum, Hela, LUPI, Meof, Pede, and Trre, Malaise trap.

Psithyrus (Laboriopsithyrus) insularis (F. Smith)

Station 12; 27 June to 21 July; on Cica and Sese.

Apis mellifera Linnaeus

Station 4 and general area; 30 June to 6 September; on flowers of Chna, Chvi.

DISCUSSION

Largest and most varied insect populations of any site under study was in Little Cottonwood Creek Canyon at station 12. This could be the result of the large variety of plant species occurring here. In addition, the small, permanent stream attracted and provided a habitat for many insect species.

Lava habitats were varied with regard to abundance of insects. Older cinder cones, such as Grassy and Sunset Cones, were found to support the greatest number of insect species because of the presence of a climax vegetation that approaches that of the surrounding non-lava areas. However, station 2 on the northeast slope of Sunset Cone had the habitat most favorable for insects. The combination of many lava-adapted plant species and the continually flowing artificial stream of water, which was established in 1965, attracted many insect species. Large numbers of aquatic Coleoptera and Hemiptera were taken from this stream. Many more Hymenoptera, Lepidoptera, and Odonata were observed and collected in 1965 than in 1964 at this site. The value of the Malaise trap as an outstanding collecting tool was demonstrated at this station. In 1965 it was placed in an open area at the bottom of a small draw between two stands of Pseudotsuga menziesii var. glauca approximately 100 feet from the small stream. More individuals were captured in the trap at this site than at

any other, including station 12.

The younger cinder cones ranked second in insect activity. However, a difference in insect numbers, due to the stand density of plants, was evident on these cones. Station 9, with a dense stand of vegetation, on the east slope of Inferno Cone did not appear to have as large and as varied an insect population as did station 6, with an open stand of vegetation, on the east slope of Broken Top. The terrestrial insect fauna at station 9, however, was more evident than in open areas at other lava sites. An unusual feature of station 6 was the presence of insects normally associated with aquatic environments, including large numbers of newly emerged damselflies and dragonflies. The author believes there must be water nearby this station although none has been reported. Several exposed waterholes are on the lava within the Monument and it is certain there must be others present.

The open cinder habitat at station 8, on Trench Mortar Flat, had markedly less insect activity than the other cinder habitats. As at the other areas, insect populations could be associated with the flowering of plants, which took place from mid-June to mid-July. The insect ground fauna was very limited in the exposed cinder at station 8.

Insect activity on the old, decomposed aa and pahoehoe flows, where plant life is varied and abundant, such as at station 11, was nearly as great as on the older cinder cones. However, the young pahoehoe flows, as exemplified at station 7,

was not favorable to insect life. Plants are not as plentiful as on the older flows and there are fewer habitats present. The high wind velocities typical of this station may also have been a factor in low insect numbers.

The least productive lava formation for insects was found to be bare aa lava such as at the Highway Aa Flow (Fig. 8), where plants are limited and growing only under local conditions where wind blown soil has accumulated.

Several plant species, growing on the lava landscape, were particularly attractive to insects. The shrub, Chrysothamnus nauseosus, was the most productive for insect collecting throughout the summer, but especially during flowering in late August and September. Large numbers of Hesperidae and Noctuidae appeared at this late summer period. The shrub, Chamaebatiaria millefolium, attracted many insects to its blossoms, particularly small Hymenoptera, but no evidence of insects living in the roots or stems was found. A few larvae of an unidentified Lepidoptera were found rolling young leaves at the tips of mature plants, but caused little noticeable damage. The herb, Phacelia leucophylla, was attractive to many insects, particularly Hymenoptera. The foliage of the tree Pinus flexilis, provided excellent collecting. In addition, many species of Coleoptera and their parasitoids were reared from trees killed by chemicals. These dead trees provided an environment for many kinds of wood boring insects (Fig. 9). Heavy feeding damage was observed in young cones

of Pinus flexilis. The unidentified Lepidopteran (possibly Eucosma sp.) responsible for this damage could not be reared to the adult form.



Fig. 8. Highway Aa Flow. Little Cotton-Wood Creek Canyon in the background (USNPS).

During this study, 20 orders, 225 families, 1054 genera, and 1844 species and subspecies were found from

Craters of the Moon National Monument (Table 1). More than 30 of the species are new. Four orders were particularly abundant in number of species and specimens.

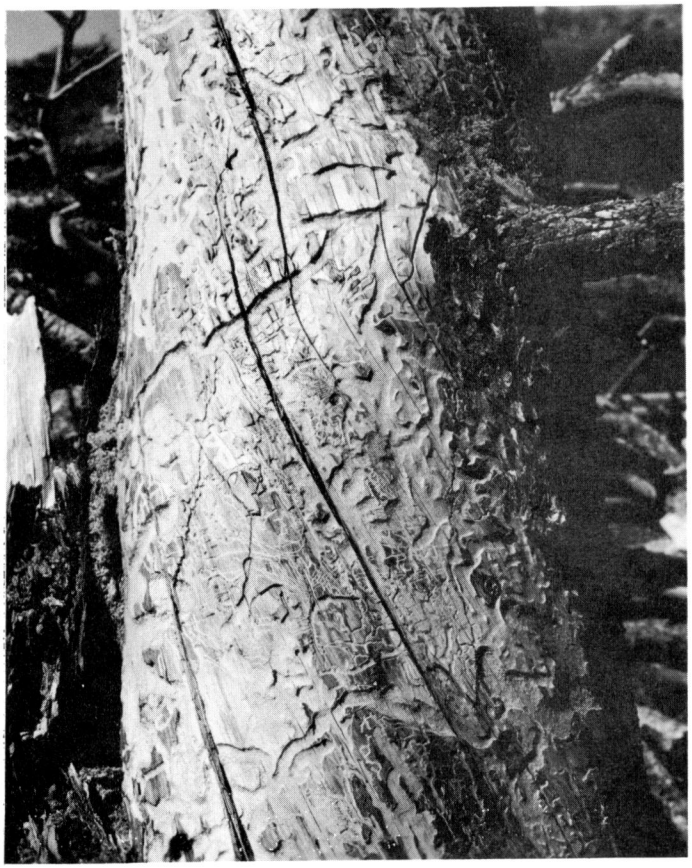


Fig. 9. Coleoptera galleries in a dead *Pinus flexilis* James (USNPS)

Hymenoptera was best represented with 315 genera, 676 species, and 4054 collected specimens. The families

Table 1. Relative size of insect orders by number of families, genera, species, and specimens collected at Craters of the Moon National Monument, Idaho, 1964-1965.

ORDERS	FAMILIES	GENERA	SPECIES	SPECIMENS
THYSANURA	2	2	2	5
COLLEMBOLA	5	6	6	66
EPHEMEROPTERA	4	4	4	21
ODONATA	4	6	10	40
ORTHOPTERA	4	14	25	143
ISOPTERA	1	1	1	28
PLECOPTERA	4	4	5	11
DERMAPTERA	1	1	1	2
PSOCOPTERA	2	3	3	38
THYSANOPTERA	3	8	10	18
HEMIPTERA	20	80	116	529
HOMOPTERA	11	38	43	558
RAPHIDOIDEA	1	1	3	8
NEUROPTERA	4	9	11	39
COLEOPTERA	42	201	325	2192
STREPSIPTERA	1	1	1	1
TRICHOPTERA	5	8	8	56
LEPIDOPTERA	28	109	169	645
DIPTERA	41	243	425	1566
HYMENOPTERA	42	315	676	4054
TOTAL	225	1054	1844	10020

with the largest number of species include Ichneumonidae with 170 species, Sphecidae with 89 species, and Braconidae with 76 species. Representatives of this order were more active in the morning than in the afternoon. Perhaps this may be correlated with the low wind velocities in the morning and the high wind velocities in the afternoon. It is possible the wind blew much of the pollen from the plants which, as a result, were less attractive to flower visiting Hymenoptera.

Diptera ranked next in number with 243 genera, 425 species, and 1566 collected specimens. However, a considerable amount of Diptera material is yet to be identified, and this order may prove to be largest in number of genera and species.

Coleoptera was third in number with 201 genera, 325 species, and 2,192 collected specimens. It is believed by the author this group was not better represented because the cinder cones, aa and pahoehoe lava flow environments are not favorable to the many ground dwelling species of this order.

There are many new state records from several orders included in this study. Several new United States records also are included, especially in the family Ichneumonidae. These records, combined with the known and new species, presents a better understanding of the insect life found at Craters of the Moon National Monument, and of the state of Idaho.

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