Cooperative National Park Resources Studies Unit

ARIZONA

TECHNICAL REPORT NO. 23

A PRELIMINARY INVESTIGATION OF THE ARTHROPOD FAUNA OF QUITOBAQUITO SPRINGS AREA, ORGAN PIPE CACTUS NATIONAL MONUMENT, ARIZONA

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ORGAN PIPE CACTUS NATIONAL MONUMENT, ARIZONA

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ABSTRACT

Insects were collected during seven field trips to Quitobaquito Springs. Several different techniques for collecting were used, including blacklight trapping, aerial and sweep netting, and hand capture. The collection reflects the interests of the investigators and is not a thorough sampling of all taxa that might be found or all microhabitats that are available. A total of 559 species-level taxa in 134 families representing 12 orders were collected. Many of these are identified to species level.

The study area is probably the only United States breeding habitat of the butterfly *Ascia howarthi* (commonly named Giant White) which is dependent upon the plant *Atamisquea emarginata* (no common name) which grows at no other location in the U.S. Protection of this rare plant is called for if the butterfly is to remain part of the fauna. The insect fauna is probably typical of Sonoran desert habitats where permanent water is present. No significant threats to insect populations were apparent or are in need of management consideration at this time.
INTRODUCTION

Quitobaquito Springs in Organ Pipe Cactus National Monument has been intensively studied over a period of many years as the most biologically diverse in the monument. Cole and Whiteside (1965) gave a brief description of the habitat, including some of the arthropod fauna. Johnson et al. (1983) discussed avian use of the area. Brown and Warren (1986) described the woody riparian vegetation at the springs. Bowers (1980) included references to the flora at Quitobaquito. Crieghton (1952) surveyed the ants of Organ Pipe Cactus National Monument, including Quitobaquito Springs. Increasing understanding and proper management of the resources calls for continued research into some of the lesser known components of the community.

Despite the facts that most of the animals in the world are insects and that the arthropod fauna plays a major part in the functioning of any ecosystem, basic inventories of arthropods are scarce to nonexistent for National Park Service areas. This preliminary survey of the arthropods of the Quitobaquito Springs area is part of an ongoing ecological study being conducted by the National Park Service.

Insects are part of the diet of the Quitobaquito pupfish (Cyprinodon macularius eremus). Insects and spiders are an important food source for many of the birds and bats that visit or reside at Quitobaquito. Native insects may be the sole pollinators of some of the unique native plants found in the area. The relative abundance and species composition of arthropods may be an index of pesticide drift from the agricultural area around Sonoyta, Mexico, which is a problem of increasing concern. This study is a first step toward gathering baseline data on these important animals, and should be of assistance in the development of a management plan for Quitobaquito.

METHODS

This study was limited to the collection and identification of members of the class Insecta. Seven field trips were taken to the area between April 23, 1983 and December 31, 1984. On each trip, insects observed were collected by standard methods such as aerial and sweep netting and hand capture. Efforts were made to sample each of the habitats present in the area, focusing primarily on the examination of individual plants that were in bloom. Blacklight trapping was done at night on each trip. Adjacent areas, including the hills north of the springs and Aguajita Wash were examined also. Little effort was made to sample for certain groups that were difficult to find or require specialized techniques, such as soil arthropods, aquatic benthos arthropods in the pond, wood borers, leaf miners, etc. The resulting collection reflects the interests of the investigators and the limitations of time and techniques, and should not be considered a truly exhaustive or complete inventory of the fauna present in the area. Identifications were made by means of use of keys in the literature, comparison with labeled specimens in the University of Arizona insect collection, and consultation with local taxonomists, Dr. Floyd Werner and Mr. Carl Olson of the University of Arizona Department of Entomology.

Specimens collected were deposited with the permanent collection at the University of Arizona Department of Entomology and with Organ Pipe Cactus National Monument.
RESULTS

Table 1 lists the insect fauna collected. The order and nomenclature of the higher groups (orders, families, subfamilies) generally follows that of Boror et al. (1981). Within the list, orders are capital letters in BOLDFACE; families are in capitals; subfamilies are indented once and in capitals and lowercase; and genus and species are indented twice and underlined. Example:

ORDER
FAMILY
Subfamily

Genus species Author/(Author)

In general, order names end with "-optera," family names end with "-idae," subfamily names end with "-inae," tribe names end with "-ini." Where possible, specimens were identified to the lowest taxonomic level (species). Species names are identified, all other levels of classification are not. The species names are followed by the name (or names) of the author or first describer of the species in the scientific literature. When an author's name appears in parenthesis, this means that the original description had the species placed in another genus. Advances are continuously being made in insect taxonomy and identification, so names change with some frequency.

Many specimens were not identified to the genus and species level. This means only that we were unable to identify them, for any one of a number of reasons. Insects identification is a complex science, even an art form; and, even a specialist in a particular group may not be able to readily identify all specimens in that group. Lack of a name in this list does not mean that the specimen represents an undescribed species, although such may be possible. Where we have identified a specimen to the lowest taxonomic level we could, but not to species, the lowest level name is followed by the abbreviation lisp." In some cases, it was evident that we had specimens representing more than one species of a genus or higher taxonomic level, but we could not positively identify them to lower taxonomic levels. Then the lowest level to which we could identify the specimens is given, followed by "sp.," and a number (1, 2, 3, etc.). In the submitted collection, specimens were grouped by taxonomic groupings, and labeled with the lowest level we could ascertain with surety. The numbers used as identifiers in this list are not part of the specimen labels, but only serve to indicate how many apparently different species were collected.
TABLE 1. Insects Collected at Quitobaquito Springs, Organ Pipe Cactus National Monument, Arizona.

**ODONATA**

**GOMPHIDAE**
- *Progomphus borealis* MacLachlan
- *Erpetogomphus compositus* Hagen

**AESHNIDAE**
- *Anax junius* (Drury)

**LIBELLULIDAE**
- *Libellula saturata* Uhler
- *Erythemis simplicicollis* Say
- *Sympetrum madidum* (Hagen)
- *Brachymesia furcata* Hagen
- *Perithemis domitia* Drury
- *Tramea* sp.*
- *Pachydiplax longipennis* (Burmeister)
- *Orthemis ferruginea* (Fabricius)
- *Pontala hymenaea* (Say)

**COENAGRIONIDAE**
- *Chromagrion* sp.
- *Argia* sp.*
- *Telebasis salva* (Hagen)
- *Neoneura* sp.*
- *Tellealagma* sp.*
- Other species: 1

**NEUROPTERA**

**CHRYSOPIDAE**
- *Chrysopa* sp. 1
- *Chrysopa* sp. 2
- *Chrysopa* sp. 3
- *Chrysoya* sp. 4
- *Eremochrysa punctinervis* McLachlan

**MYRMELEONIDAE**
- *Hesperoleon* sp. 1
- *Hesperoleon* sp. 2
- *Hesperoleon* sp. 3
- *Eremoleon nigribasis* Banks
- *Vella hesperus* Banks

**HEMEROBIIDAE** Species: 1

* denotes species throughout table were also collected by Cole and Whiteside, 1965.
**denotes species collected by W.S. Creighton in 1952 (note found only on page 18).
DERMAPTERA
LABIDURIDAE
Labidura riparia (Pallas)

CARCINOPHORIDAE
Euborellia sp.

TRICHOPTERA
LEPTOCERIDAE
Oecetis sp.

THYSANOPTERA
AELOTHRIPIDAE
Species: 1

ORTHOPTERA
ACRIDIDAE

Acrinidae
Ligurotettix coquilletti McNeill
Opeia obscura (Thomas)
Horesidotes cinereus Scudder
Cibolacrís parviceps (Walker)

Oedipodinae
Trimeritropis pallidipennis (Burmeister)
Lactista azteca (Saussure)
Anconia integra (Scudder)
Heliastus benjamini Caudell

Cyrtacanthacridinae
Schistocerca vaga (Scudder)
Melanoplus sp.
Aeoloplides tenuipennis (Scudder)
Hesperotettix viridis (Thomas)
Leptysma hebardi Rehn and Eades

TETTIGONIIDAE
Neoconocephalus triops (L.)
Scudderia mexicana (Saussure)
Ateloplus schwarzi Caudell
Eremopedes bilineatus (Thomas)
Insara elegans (Scudder)
Insara covilleae Rehn and Hebard

GRYLLIDAE
Gryllus sp.
Nemobius sp.

MANTIDAE
Litaneutria minor Scudder
Stagmomantis californica Rehn and Hebard
BLATTELLIDAE
   Blattella vaga Hebard

HOMOPTERA

MEMBRACIDAE
   Spissistilus festinus (Say)

CICADELLIDAE
   Gyponinae
      Species: 1
   Iassinae
      Stragania sp.
   Hecalinae
      Species: 1
   Agalliinae
      Aceratagallia sp.
   Typhlocybinae
      Empoasca sp. 1
      Empoasca sp. 2
   Deltocephalinae
      Scaphytopius nigricollis (Ball)
      Scaphytopius sp.
      Opsius stactogalus Fieber
      Other species: 5

   Cicadellinae
      Homalodisca sp.
      Carneocephala sp.
      Other species: 1

DELPHACIDAE
   Species: 1

CIXIIDAE
   Species: 2

FULGORIDAE
   Cyroptus sp.

FLATIDAE
   Ormenis sp.

PSYLLIDAE
   Species: 1

CERCOPIDAE
   Clastoptera sp.

ISSIDAE
   Species: 1
HEMIPTERA

PENTATOMIDAE
Chlorochroa savi Stal
Chlorochroa ligata (Say)
Thyanta pallidovirens Stal
Mecidea minor Sailer

CYDNIDAE
Melanaethus sp.
Tominotus conformis communis (Uhler)

COREIDAE
Leptoalossus brevirostris Barber

RHOPALIDAE
Liorhyssus hyalinus (F.)
Harmostes reflexulus (Say)
Aufeius imnressicollis Stal

LYGAEIDAE
Lygaeus lateralis Dallas
Nysius raphanus Howard

LARGIDAE
Largus cinctus Herrich-Schaeffer

BERYTIDAE
Pronotacantha annulata Uhler

TINGIDAE
Species: 1

REDUVIIDAE
Zelus renardii Kolenati
Zelus socius Uhler
Rasahus biguttatus (Say)
tenolemoides arizonensis (Banks)
Triatoma rubida (Uhler)

MIRIDAE
Phytocoris sp.
Oncerometopus nigriclavus Reuter
Other species: 4

VELIIDAE
Microvelia sp.

NOTONECTIDAE
Notonecta indica L.
Buena arizonis Bare
NAUCORIDAE

Amrysus californicus Montandon

LEPIDOPTERA

HESPERIIDAE

Lerodea eufala (Edwards)
Lerodea arabus (Edwards)
Nyctelius nyctelius (Latreille)
Copaeodes aurantiaca (Hewitson)
Hylephila Rhyleus (Drury)
Pholisora libya (Scudder)
Prygus albescens Plotz
Prygus philetas Edwards
Prygus scriptura (Boisduval)
Heliopetes domicella (Erichson)
Erynnis funeralis (Scudder and Burgess)
Systasea zampa Edwards

PAPILIONIDAE

Battus philenor (L.)

PIERIDAE

Pieris protodice (L.)
Colias eurytheme Boisduval
Colias cesonia Stoll
Phoebis sennae L.
Kricogonia lyside Godart
Ascia howarthi (Dixey)
Eurema nicippe Cramer
Euema mexicana Boisduval
Anthocaris pima Edwards
Nathalis iole Boisduval

LYCAENIDAE

Calephelis nemesis Edwards
Apodemia mormo Felder and Felder
Apodemia palmerii Edwards
Minstrymon leda Edwards
Chlorostrymon simaethis Drury
Atlides halesus Cramer
Strymon melinus Hubner
Strymon columella Fabricius
Leptotes marina Reakirk
Hemiargus isola Reakirk
Hemiargus ceraunus Fabricius
Brephidium exilis Boisduval

LIBYTHEIDAE

Libytheana bachmanii (Kirtland)
HELICONIIDAE
   Agraulis vanillae (L.)

NYMPHALIDAE
   Asterocampa leilia Edwards
   Marpesia petreus Cramer
   Nymphalis antiona L.
   Precis coenia Hubner
   Precis nigrosuffusa (Barnes and McDunnough)
   Vanessa cardui L.
   Vanessa virginiensis Drury
   Vanessa annabella (Field)
   Vanessa atalanta L.
   Anthanassa texana (Edwards)
   Chlosyne californica (Wright)
   Chlosyne lacinia (Geyer)
   Euptoieta claudia (Cramer)

DANAIDAE
   Danaus gilippus (Cramer)
   Danaus plexippus (L.)

TINEIDAE
   Acrolophus sp.
   Other species: 1

GRACILLARIIDAE Species: 1

GELECHIIDAE
   Specimens: 8

PLUTELLIDAE
   Plutella sp.

YPONOMEUTIDAE
   Atteva punctella (Cramer)

SESIIIDAE
   Hypopta palmata Barnes and McDunn
   Comadia intrusa Barnes and McDunn

TORTRICIDAE
   Species: 1

PYRALIDAE
   Evergestinae
      Evergestis notentis
   Phycitinae
      Cactobrosis fernaldialis (Hulst)
      Alberada parabates (Dyar)
      Other specimens: 8
   Crambinae
      Diatraea grandiosella (Dyar)
PYRALIDAE (Contd.)

Pyraustinae

Hymenia perspectalis (Hubner)
Loxostege albiceralis Grote
Loxostege sp.
Achyra sp.
Hahncappsia sp.
Nomophila sp.
Other species: 3

Nyphulinae

Petrophila jaliscalis

GEOMETRIDAE

Synchlos a rubrifrontaria Packard
Chlorochlamys gyllinaria Zeller
Metasiopsis peralbata Packard
Cosymbia serrulata Packard
Eubarnesia ritaria (Grossbeck)
Glaucina sp.
Archihoe sp.
Tornos sp.
Anacamptodes obliquaria Grote
Anacamptodes dataria Grote
Semiothisa irrorata Packard
Semiothisa hypaethrata Grote
Semiothisa s-signata Packard
Semiothisa sp. 1
Semiothisa sp. 2
Apicia sp.
Other species: 2

SPHINGIDAE

Hyles lineata (F.)
Manduca sexta (L.)
Manduca guinquemaculata (Haworth)

ARCTIIDAE

Cisthene angelus Dyar
Ctenucha venosa Walker

NOCTUIDAE

Pseudaletia unipuncta (Haworth)
Bulia deducta (Morrison)
Heteranassa mimes Harvey
Schinia intrabilis Smith
Schinia balba Grote
Forsebia perlaeta Edwards
Meliothis acontioides Guenee
Matigramma rubrosuffusa Grote
Xylomyges curialis Grote
NOCTUIDAE (Contd.)

Heliothis zea (Boddie)
Autographa sp.
Erebus odora (L.)
Catocacala junctura Grote
Hemeroplanis subflavidalis Grote
Onocnemis occata Grote
Spragueia magnifica Grote
Spodoptera exigua (Hubner)
Grotella binda Barnes
Azenia implora Grote
Timora toralis Grote
Acontiæ sp. 1
Acontiæ sp. 2
Conocharæs acuta Smith
Conocharæs catalina no author
Conocharæs arizonæ Edwards
Conocharæs sp.
Pseudohadenæ vulnerea Grote
Lepipolys perscriptura Guenee
Cyathissæ pallida Smith
Aseptis catalina Smith
Lacinipoliæa sp. 1
Lacinipoliæa sn. 2
Chorizagrotis auxiliaris Grote
Chorizagrotis sp.
Agrotis malefida (Guenee)
Other specimens: 21

COLEOPTERA

CICINDELIDAE

Cicindela lemniscata LeConte
Cicindela sp.

CARABIDAE

Omophron sp.
Lebia viridis Say
Lebia sp. 1
Lebia sp. 2
Bembidion sp. 1
Bembidion sp. 2
Agonoderus sp.
Calosoma peregrinator Guerin
Calosoma sp.
Poeclius subchordatus LeConte
Bradycellus sp.
Brachinus sp.
Scizogenuis sp.
CARABIDAE (Contd.)
  Tachys sp.
  Pterostichini sp.

DYTISCIDAE
  Rhantus gutticollis (Say)
  Eretes sticticus (L.)
  Laccophilus sonorenis Zimmerman
  Laccophilus fasciatus Aube *
  Laccophilus pictus Castelman
  Deronectes striatellus (LeConte)
  Deronectes roffii nebulosus *
  Dytiscus habilis Say *
  Copelatus chevrolati Guignot
  Cybister sp. *

HYDROPHILIDAE
  Hydrophilus triangularis say
  Helophorus sp.
  Tropisternus lateralis (F.) *
  Tropisternus ellipticus (LeConte) *
  Berosus ruqulosus Horne
  Chaetarthria pallida (LeConte)
  Enochrus pygmaeus (LeConte)

STAPHYLINIDAE
  Tachyporinae
    Species: 4
  Paederinae
    Species: 3
  Staphylininae
    Species: 2

SCARABAEIDAE
  Melolonthinae
    Diplotaxis sp.
    Other species: 4
  Aphodiinae
    Psammobius guinqueplicatus Horn
    Other species: 1
  Geotrupinae
    Species: 1
  Dynastinae
    Ligyrus sp.
  Cetoniinae
    Cremastocheilus sp.
HETEROCERIDAE  
Dampfius sp.  
Other species: 1

DRYOPIDAE  
Helichus sp.

BUPRESTIDAE  
Acmaeodera flavomarginata Gory  
Acmaeodera gibbula LeConte

ELATERIDAE  
Diplostethus opacicollis Schaeffer  
Discrepidius corvinus Candeze  
Eniconyx sp.  
Aeolus mellilus (Say)  
Conoderus sp.  
Other species: 2

ANOBIIDAE  
Tricorynus sp.

BOSTRICHIDAE  
Bostrichinae  
Species: 1

CLERIDAE  
Cymatodera oblita Horn  
Cymatodera sp. 1  
Cymatodera sp. 2

DASYTIDAE  
Species: 1

MELOIDAE  
Lytta magister Horn  
Pyrota palpalis Champion  
Epicauta wheeleri Horn  
Epicauta lauta (Horn)  
Epicauta tenella (LeConte)

MORDELLIDAE  
Mordellistena sp.  
Other species: 1

TENEBRIONIDAE  
Tenebrioninae  
Eleodes armata LeConte  
Eleodes caudata Le Conte  
Ulus crassus (LeConte)  
Ammodonus granosus Fall
TENEBRIONIDAE (Contd.)
   Other species: 1
   Tentyriinae
      Cryptoglossa verrucosa LeConte
      Other species: 2
   Asidinae
      Asidina confluens Asidinae
      Asidina confluens (LeConte)
      Other species:
LAGRIIDAE
   Statira sp.
ALLECULIDAE
   Hymenorus sp.
   Other species: 4
OEDEMERIDAE
   Xanthochroina sp.
   Oxacis sp.
ANTHICIDAE
   Notoxus sp.
   Anthicus sp. 1
   Anthicus sp. 2
NITIDULIDAE
   Carpophilus sp.
COCCINELLIDAE
   Hippodamia convergens Guerin
   chilocorus cacti L.
   Olla obdominalis (Say)
CERAMBYCIDAE
   Taranomis bivittata (Dupont)
   Aneflus pratensis Leconte
   Crossidius suturalis Leconte
   Osmidius guttatus Leconte
   Peropleum sp.
Cerambycinae
   Species: 1
CHRYSOMELIDAE
  Cryptocephalinae
    Pachybrachys sp. 1
    Pachybrachys sp. 2
    Pachybrachys sp. 3
  Galerucinae
    Species: 1
  Alticinae
    Species: 2

BRUCHIDAE
  Algarobius prosopis (Leconte)
  Mimosestes amicus (Horn)

CURCULIONIDAE
  Anthonominae
    Species: 1
  Ceutorhynchinae
    Species: 1

MALACHIIDAE
  Collops sp. 1
  Collops sp. 2

DIPTERA

TIPULIDAE
  Tipula sp. 1
  Other species: 2

CULICIDAE
  Anopheles franciscanus McCracken

CHIRONOMIDAE
  Tanypodinae
    Tanypus sp.
  Diamesinae
    Species: 1
  Chironominae
    Species: 2
  Orthocladiinae
    Species: 2
    Other species: 1

CERATOPOGONIDAE
  Ceratopogoninae
    Species: 1
  Dasyheleinae
    Species: 1
BIBIONIDAE
  Bibiodes sp.

CECIDOMYIIDAE
  Neolasioptera sp. 1
  Asphondyliini
    Species: 2
  Cecidomyiini
    Species: 1
  Lestremiinae
    Species: 2
  Other species: 1

TABANIDAE
  Chrysops sp.
  Apatolestes aitkeni Philip

ASILIDAE
  Saropogon sp.
  Efferia sp. 1
  Efferia sp. 2
  Efferia sp. 3
  Mallophorina sp.

BOMBYLIIDAE
  Thyridanthrax sp.
  Geron sp. 1
  Geron sp. 2
  Paravilla sp.
  Heterostylum robustum (Osten Sacken)
  Lordotus sp. 1
  Lordotus sp. 2
  Poecilanthrax sp. 1
  Poecilanthrax sp. 2
  Bombylius major L.
  Anthrax sp.
  Oligodranes sp.
  Lepidanthrax sp. 1
  Lenidanthrax sp. 2

DOLICHOPODIDAE
  Tachytrechus angustipennis Loew
  Chrysotus sp. 1
  Chrysotus sp. 2
  Medetera sp.
  Hydrophorus sp.
  Condylostylus inornatus (Aldrich)
  Others species: 3
STRATIOMYIDAE
    Odontomyia sp.
    Hedriodiscus currani James

SYRPHIDAE
    Scaeva pyrastri (L.)
    Eupeodes volucris Osten Sacken
    Volucella apicifera Townsend
    Volucella sp. 1
    Eristalis aeneus (Scopoli)
    Eristalis latifrons Loew
    Mesograpta sp.
    Baccha clavata (F.)

NERIIDAE
    Odontoloxozus longicornis (Coquillett)

OTITIDAE
    Diacrita costalis Gerstaecker

TEPHRITIDAE
    Euaresta bellula Snow
    Other species: 1

LAUXANIIDAE
    Camptoprosopella sp.

SPHAEROCERIDAE
    Leptocera sp. 1
    Leptocera sp. 2
    Scatophora sp.

HELIOMYZIDAE
    Pseudoleria sp.

DROSOPHILIDAE
    Drosophila sp.
    Other species: 1

EPHYDRIDAE
    Species: 1

CHLOROPIDAE
    Pseudogaurax sp.
    Lasiopleura sp.

ANTHOMYIIDAE
    Scatophora sp.
MUSCIDAE
   Species: 3

CALLIPHORIDAE
   Cochliomyia sp.
   Lucilia sp.
   Phaenicia sp.

SARCOPHAGIDAE
   Sarcophaga sp. 1
   Sarcophaa sp. 2

TACHINIDAE
   Euphascopteryx ochracea Bigot
   Others species: 4

CUTEREBRIDAE
   Species: 1

HYMENOPTERA

BRACONIDAE
   Agathidinae
   Zelomorpha sp.
   Other species: 1
   Braconinae
   Species: 1

ICHNEUMONIDAE
   Compsocryptus calipterus (Say)
   Tryphoninae
   Netelia sp.
   Ophioninae
   Enicospilus sp.
   Tersolochini
   Species: 1
   Other species: 3

FORMICIDAE
   Pogonomyrmex pima Wheeler **
   Novomessor cockerelli (Andre)**
   Veromessor pergandeí (Mayr)**
   Pheidole vasiiti arizonica Santschi**
   Iridomyrmex pruinosum analis (Andre)**
   Solenopsis xyloní (McCook)

CHALICIDOIDEA
   Species: 1

EULOPHIDAE
   Species: 1
CYNIPIDAE
Species: 1

SCELIONIDAE
Species: 2

TIPHIIDAE
Brachycistis triangularis Fox
Brachycistis chinensis Bradley
Brachycistis arenivaga Bradley
Brachycistis sp.
Paratiphiia sp.
Myzinum sp.

MUTILLIDAE
Odontophotopsis sp.
Sphaerophthalma sp.
Acanthophotopsis sp.
Other species: 6

SCOLIIDAE
Camposocologia flamicoma (Bradley)
Scolia otomita Saussure
Scolia ardens Smith
Camposomeris tolteca (Saussure)

POMPILIDAE
Hemipepsis ustulata Dahlbom
Pepsis mexicana Lucas
Pepsis chrysothemis Lucas
Pepsis mildei Stal
Pepsis pallidolimbata Lucas
Episyron posterus (Fox)
Anoplius sp.
Pompilus expulsus Schulz
Other species: 1

EUMENIDAE
Stenodynerus sp. 1
Stenodynerus sp. 2
Other species: 2

SPHECIDAE
Ammophila breviceps Smith
Ammophila sp.
Ammophila aberti Haldeman
Ammophilini
Podalonia mexicana (Saussure)
Aphilanthops hispida Fox
Trypoxylon sp.
Glenostictia sp.
Bembix sayi Cresson
Bembix sp.
Steniola duplicata Provancher
Liris sp..
Prionyx sp.
Sphex sp.
Eucerceris sp.
Other species: 1

HALICTIDAE
Agapostemon melliventris Cresson
Nomia nevadensis (Cockerell)
Nomia tetrazonata Cockerell
Augochlorella pomeriella Cockerell
Lasioglossum sp.

ANDRENIDAE
Andrena sp.
Other species: 1

MELITTIDAE
Ashmeadiella sp.

ANTHOPHORIDAE
Diadasia sp.
melissodes sp.
Hemisia sp.
Anthophora sp.
Other species: 1

APIDAE
Apis mellifera L.

MEGACHILIDAE
Lithurginae
Species: 1
Megachilinae
Chalicodoma sp.
Other species: 3
DISCUSSION

Biogeographic affinities of the insect fauna of Quitobaquito are difficult to evaluate meaningfully. Usually known species ranges are limited to those areas that have received adequate surveillance. For many species, ranges vary from year to year, depending upon weather conditions. However, we have attempted to group the distributions of 129 species found at Quitobaquito Springs into areas in which they might be expected to occur with greatest frequency. These and the number of species and percent of the total 129 species included in this analysis are:

<table>
<thead>
<tr>
<th>AREA</th>
<th>NUMBER OF SPECIES</th>
<th>PERCENT OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmopolitan</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Introduced</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>North &amp; South America</td>
<td>18</td>
<td>13.9</td>
</tr>
<tr>
<td>North &amp; Central America</td>
<td>11</td>
<td>8.5</td>
</tr>
<tr>
<td>North America</td>
<td>10</td>
<td>7.8</td>
</tr>
<tr>
<td>United States</td>
<td>5</td>
<td>3.9</td>
</tr>
<tr>
<td>Western U.S. &amp; Mexico</td>
<td>26</td>
<td>20.2</td>
</tr>
<tr>
<td>Western U.S.</td>
<td>18</td>
<td>13.9</td>
</tr>
<tr>
<td>Southern U.S.</td>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>Southwestern U.S.</td>
<td>16</td>
<td>12.3</td>
</tr>
<tr>
<td>Arizona-California</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Arizona-Sonora</td>
<td>11</td>
<td>8.5</td>
</tr>
<tr>
<td>Arizona</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>129</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The data presented in Table 2 indicates that the insect fauna of Quitobaquito is representative to that found in any similar area of the Southwestern U.S. or Northern Mexico, than includes permanent water. There is a predominance of widespread species that are adaptable to a variety of situations.

The only really noteworthy distribution record is that of the butterfly, *Ascia howarthi* (Dixey), which is primarily a Mexican species, with a few U.S. records. This species is associated with, and completely dependent upon the plant *Atamisguea emarginata*, which is found in the U.S. only near Quitobaquito Springs. Bailowitz (1985) present a detailed discussion.
of the distribution and biology of this species. This species was formerly considered to be conspecific with *A. josephina* (Godart), but has been evaluated to species level based on behavioral, ecological, and morphological evidence (Bailowitz 1987).

Two species are introduced and have become naturalized throughout the United States. The Honeybees, *Apis mellifera*, have become naturalized from domestic colonies. Bee specimens collected at Quitobaquito may have been members of domestic colonies kept at the site by the National Park Service for observation of pesticide drift, or may have been from wild colonies. The other introduced species is the striped earwig, *Labidura riparia* (Pallas). It was first found in Arizona at Yuma in 1952, and has become widespread in the southern part of the state. It is a predator on other insects, especially maggots. Occasionally, it may invade houses because it is attracted to lights, and may become a nuisance (Ebeling 1978). At Quitobaquito, it probably lives in soil, under leaves and other debris, and is uncommon and harmless creature.

Management implications of this research are not clear-cut. The ways in which present management techniques impact the arthropod fauna are not evident, save that the present condition of the habitat diversity provides a variety of resources for insects, including both stream and pond habitats for aquatic insects. Most, if not all, of the insect species present would likely remain present as long as this habitat diversity is maintained. Because of the very small extent of the distribution of *Atamiscguea emarginata*, the population of *Ascia howarthi* is at some risk of extirpation in the U.S., should some misfortune befall the host plant. It is possible that insecticide use in the neighboring agricultural land in Mexico may adversely impact some components of the Quitobaquito fauna, particularly in the extent of extreme drift of aerially applied insecticides (NPS data available). However, since most of the fauna is widespread and highly mobile, eventual reestablishment following local catastrophe is likely.

It cannot be overemphasized that this study was based on a very small number of field trips, and many taxa may have been overlooked. Because insect populations in an area may be ephemeral, or cryptic or migratory, a much more extensive survey is needed to develop a clear understanding of the insect fauna. This study may, however, provide a good basis on which to begin more extensive work.
LITERATURE CITED


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