AD 697 176

ARTHROPODS OF MEDICAL IMPORTANCE IN AMERICA NORTH OF MEXICO

B. V. Travis, et al

New York State College of Agriculture
Ithaca, New York

January 1969

Distributed ... 'to foster, serve and promote the nation's economic development and technological advancement.'

CLEARINGHOUSE
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards

This document has been approved for public release and sale.

DISTRIBUTION OF THIS
DOCUMENT IS UNLIMITED

AD_____

TECHNICAL REPORT
69-2-ES

ARTHROPODS OF MEDICAL IMPORTANCE IN AMERICA NORTH OF MEXICO

By

B. V. TRAVIS, Ph.D.

HELEN H. LEE, Ph.D.

RENATO M. LABADAN, Ph.D.

College of Agriculture, Cornell University
Ithaca, New York

January 1969

Project Reference:
1T025112A129

Series:
ES-47

U.S. Army Material Command
U.S. ARMY NATICK LABORATORIES
Natick, Massachusetts 01760

This report presents results of Contract DA19-129-AMC-664(N)

Sponsored by
OFFICE, CHIEF OF RESEARCH AND DEVELOPMENT
Department of the Army

Monitored by
Earth Sciences Laboratory
U.S. Army Natick Laboratories

FOREWORD

This report is one of the end-products of a series of studies that began in 1952 when the Office of The Quartermaster General awarded a contract to Cornell University for summarization of distributional data for insects and other arthropods of medical importance. The studies were planned in cooperation with personnel of the Office of the Surgeon General and the U. S. Department of Agriculture. Dr. Bernard V. Travis, Professor of Medical Entomology and Parasitology at Cornell University, has been the principal investigator since the inception of the series. A thorough search was made of the entomological literature, and for each country and major geographical region of the world a "summary report" was prepared, listing the reported occurrences and habitat data for medically important arthropods. These summary reports were placed on file at the Natick Laboratories and the Military Entomology Information Service, Walter Reed Hospital, where they are available for loan and reference.

By 1964 it became evident that changes in the field of entomology--both in knowledge acquired and in the distributions of some species--required updating of the material contained in the country summary reports. It was decided also that the material would be more useful if consolidated on a continental rather than a country basis. Contracts were let with Cornell University for accomplishing these two tasks simultaneously, and the present report for America North of Mexico is a result of this work. This is the fifth of six continental reports.

The distributions of the most important species have been mapped by the University of Pittsburgh's Department of Geography, and the maps will be published in an Atlas of Medically Important Arthropods, to accompany this and the other continental summaries.

The contract under which this work was accomplished was supported by funds from the Office of the Chief of Research and Development, Department of the Army. This contract was monitored by Dr. William C. Robison, Chief of the Geography Division, this Laboratory. Dr. John J. Pratt, Jr., Head of the Applied Entomology Group of the Pioneering Research Laboratory, was alternate project officer.

The following members of the staff at Cornell University assisted the authors in preparing this compilation: Eveline Aron, Editha G. Gagni, Erika Zeballos and Ruth Breen, Librarian, Department of Entomology, Cornell University. Priscilla R. Lawrence typed the manuscript.

The Earth Sciences Laboratory is pleased to be able to present the results of the labors of Dr. Travis and his co-workers for the use of Army specialists in preventive medicine, public health officers, and entomologists.

TABLE OF CONTENTS

	Page
Abstract	vii
INTRODUCTION	viii
1. Format of this report	viii
2. Table 1 explained	viii
3. Table 2 explained	x
4. Literature Cited section explained	x
5. Special comments	x
GEOGRAPHICAL INDEX and MAP	
ARTHROPOD DATA	
A. Mosquitoes	1
1. Table 1. Mosquitoes	2
2. Table 2. Summary of diseases or disease organisms transmitted by mosquitoes	98
3. Literature cited	100
B. Black flies	111
1. Table 1. Black flies	112
2. Literature cited	140
C. Sand flies	145
1. Table 1. Sand flies	146
2. Literature cited	147
D. Midges	149
1. Table 1. Midges	150
2. Literature cited	161
E. Horse flies	163
1. Table 1. Horse flies	164
2. Table 2. Summary of diseases or disease organisms transmitted by horse flies	216
3. Literature cited	217

TABLE OF CONTENTS

		Page
F.	Biting flies	221
	1. Table 1. Biting flies	222
	2. Table 2. Summary of diseases or disease organisms transmitted by biting flies	223
	3. Literature cited	224
G.	Non-biting flies	225
	1. Table 1. Non-biting flies	226
	2. Table 2. Summary of diseases or disease organisms transmitted by non-biting flies	230
	3. Literature cited	233
H.	Fleas	235
	1. Table 1. Fleas	236
	2. Table 2. Summary of diseases or disease organisms transmitted by fleas	281
	3. Literature cited	283
I.	Bugs	287
	1. Table 1. Bugs	288
	2. Table 2. Summary of diseases or disease organisms transmitted by bugs	292
	3. Literature cited	293
J.	Urticating and vesicating arthropods	295
	1. Table 1. Urticating and vesicating arthropods	296
	2. Table 2. Summary of diseases or disease organisms transmitted by urticating and vesicating arthropods	297
	3. Literature cited	298
K.	Ticks	299
	1. Table 1. Ticks	300
	2. Table 2. Summary of diseases or disease organisms transmitted by ticks	312
	3. Literature cited	314

TABLE OF CONTENTS

		Page
L.	Mites	319
	1. Table 1. Mites	320
	2. Table 2. Summary of diseases or disease organisms transmitted by mites	326
	3. Literature cited	327
M.	Miscellaneous arthropods	331
	1. Table 1. Miscellaneous arthropods	332
	2. Table 2. Summary of diseases or disease organisms transmitted by miscellaneous arthropods	334
	3. Literature cited	335

ABSTRACT

The occurrence of insects and other arthropods of medical importance in America North of Mexico is summarized on the basis of review of most of the available references in the scientific literature. The report includes, for each major group of arthropods, a listing of species and subspecies with biological and distributional data, tabulations of diseases or disease organisms transmitted, and literature citations.

The groups of arthropods included, with the number of species or subspecies in parentheses, are:

Mosquitoes (361), Black flies (234), Sand flies (13), Midges (122), Horse flies (554), Biting flies (4), Non-biting flies (45), Fleas (543), Bugs (30), Urticating and vesicating arthropods (9), Ticks (110), Mites (78), and Miscellaneous arthropods (17).

ARTHROPODS OF MEDICAL IMPORTANCE IN AMERICA NORTH OF MEXICO

INTRODUCTION

1. Format of this report

As will be seen from the Abstract and the Table of Contents, the data in this report are presented according to arthropod groups.

For each arthropod group the data are presented in tables, one or two as required. In Table 1, which is the basic table for each arthropod group, are listed the arthropods, biological data, distribution, and documentary references. In Table 2 are summarized the disease organisms said by the author or authors to be transmitted by the arthropods.

After the above-mentioned tabular material there is, for each arthropod group, a section of Literature Cited, containing the complete citations referred to in the basic table (Table 1).

The format of the data sections of the report is explained below. At the end of this Introduction there are brief explanatory comments on synonymy, interpretation of statements, and the order of listings for any particular species in Table 1.

2. Table 1 explained

For each group of arthropods (mosquitoes, black flies, etc.) its basic table, Table 1, lists for each species and subspecies the distribution (country or countries), together with any biological data, and the reference documenting each entry. We will explain this table by considering entries under each column heading in turn.

a. SPECIES

Under the first heading, SPECIES, is entered: genus, species, subspecies (if any), and describer.

The format for a typical entry under SPECIES is somewhat variable, depending on the information available for each arthropod group. Typically, the genera and species are listed in alphabetical order in each group. No entries are made for subgenera. However, the subspecies, varieties and forms are listed as they appear in the publications. The describer's name is given unless the author has not listed the name and it is not clear from the literature what the describer's name should be.

See note on synonymy at the end of this Introduction.

b. BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION

The basic data on Table 1 are presented under these headings. The entries in the table are made in the same order as the heading indicates, and are separated by the same punctuation mark, ";". "No data" is indicated by "---"; that is, there may be no data on BREEDING HABITATS or ADULT ACTIVITY. Under DISTRIBUTION, the third category of information, a number is entered; this number represents a country or island in America North of Mexico, which may be identified by consulting the Geographical Index immediately following this Introduction.

For example, the first entry on *Aedes aegypti* on page 2 (---;---;62°) means that there are no data on BREEDING HABITATS or ADULT ACTIVITY for Canada (number 62 under DISTRIBUTION, as identified in the Geographical Index) for the particular species, although the indicated reference (Downe et al.) shows that the species occurs there.

Further comments on each part of this heading follow:

BREEDING HABITATS: No entry is made (as indicated by "---") unless the author makes clear and specific statements. The data concerning the biology of the immature forms are quite sparse, except for mosquitoes.

ADULT ACTIVITY: Again, no entry is made (as indicated by "---") unless the author makes clear and specific statements. Except for mosquitoes, the authors present little biological data for adult arthropods.

DISTRIBUTION: As indicated by the heading, the third category of information is DISTRIBUTION and the entry in the table consists of one or more numbers. These numbers represent countries or islands in America North of Mexico and may be identified by referring to the Geographical Index. All entries in this report use these numbers (in the DISTRIBUTION column of both Table 1 and Table 2) instead of the full country or island name. For example, 62 is the number for Canada. Where the authors have not recorded a specific country, an inclusive number is used. For example, 351 is the number for North America. For explanation of symbols attached to the country numbers in this column, see paragraph c immediately below.

c. Symbols attached to the country number or to a reference date

In the DISTRIBUTION column, the country number may have a symbol attached to it, e.g., 62* or 62°. In the DATE column, the date may have a symbol attached to it, e.g., 1936+.

Symbol * after a country number indicates that the species is said by the author to transmit a disease organism to man. For example, on page 2 of this report, the second entry on *Aedes aegypti* ends with ". . .323**°". This means that the species in the United States (country 323 in the Index) is said to transmit a disease organism to man. When this symbol is used, the species of arthropod and the disease transmitted are entered in the table immediately following; that is, such entries in Table 1 are summarized in Table 2. Where two asterisks (**) appear, they refer to two separate diseases.

Symbol ° after the country number indicates that the species is said by the author either to bite or directly annoy man. For example, on page 2 of this report the first entry on *Aedes aegypti* ends with ". . .62°". This means that this particular species in Canada (country 62 in Geographical Index) is said by the author either to bite or annoy man. These entries are not summarized, as are those marked "*" above.

Symbol + after a reference date indicates that the record is an unconfirmed entry. In this report there are only two entries with this symbol; they are on pages 29 and 53. This means that these entries need further confirmation.

d. (GENERAL STATEMENTS)

In addition to the three main categories of information as described above, the column heading indicates that there may be general statements. If so, this entry is made after those of the three main categories and is enclosed in parentheses, exactly as the column heading indicates. This may be a statement for either the various countries or continents or for the various species. For example, on page 2 of this report, the third entry ends ". . .(Forest pools, ditches, excavations)".

e. AUTHOR and DATE

Every entry in Table 1 is documented by an author (or a senior author) and date of publication. The AUTHOR and DATE (year of cited publication) are entered in the last two columns of Table 1. (The complete literature citation is given, for each arthropod group, in the section immediately following the tables.)

3. Table 2 explained

As noted in 2c, all listings marked "*" in a table are summarized for the particular species of arthropod, in the table immediately following, giving the country or countries where occurring, and the disease or disease organism transmitted.

Table 2 summarizes such items from Table 1. For example, on page 2 of this report (Mosquitoes, Table 1) the next to the last listing ends ". . .323**". We note on page 3, under the same species, another listing ending ". . .323". These and similarly marked listings are summarized in Table 2, page 98. Besides the SPECIES and DISTRIBUTION, the table also gives information on DISEASE OR DISEASE ORGANISM. Entries in these columns are discussed below.

a. SPECIES and DISTRIBUTION

The SPECIES is, of course, that indicated in Table 1, and the DISTRIBUTION column summarizes all the numbers (i.e., countries or islands) that are marked "*" listed under DISTRIBUTION in Table 1 for this particular species.

b. DISEASE OR DISEASE ORGANISM

Under this heading there are four subheadings (VIRUS & RICKETTSIA; PROTOZOA; HELMINTHS; OTHER). The subheading itself may be broken down, where necessary. For example, on page 98 (Mosquitoes, Table 2), the first subcolumn (VIRUS & RICKETTSIA) is broken down as: Dengue and Yellow fever, with numbers indicating the appropriate distribution.

4. Literature Cited section explained

At the end of each arthropod section there is a complete list of Literature Cited, as referred to in the last column of Table 1 (AUTHOR and DATE).

The abbreviations of the periodicals follow the World List of Scientific Periodicals.

5. Special comments

a. A note on synonymy

The problem of attempting to straighten out synonymy of scientific names is beyond the scope of this report. Except for a few species, the scientific names, as used by the authors, are entered in the tables. In a few cases we have followed the synonymy of an acceptable monograph As there is no universal agreement among taxonomists, the responsibility of synonymy must be referred to the interpretation of each specialist.

b. A note on interpretation of statements

An attempt has been made to avoid interpreting the published statements. This has been found difficult in matters concerning disease transmission; thus it is often clearer if we use the author's own words. In general, it has been found that a few authors make unqualified statements concerning the vectors. Also, as one might expect, most of the statements are based on epidemiological evidence and not on actual transmissions.

c. Order of listings for same species in Table 1

If there is more than one country number for a single entry, the country numbers are arranged in ascending order. For example, on page 4, the fourth listing reads: ". . . 5, 62, 126 . . ."

When there is more than one entry (that is, citation with Author and Date) under a single species and describer, the entries are listed in ascending order of country number, based on the first (lowest) number for each entry. For example, on page 2, under *Aedes aboriginis*, the first listing is 5, the next 5, 62, then 62 (four listings), and finally 323. Since all countries mentioned by a single author are listed in that entry, the countries under a given species are not necessarily all in numerical order when there is more than one entry for that species.

GEOGRAPHICAL INDEX

In 1962 a world-wide Geographical Index was published* listing countries and major regions in alphabetical order, and assigning to each a number. The following list consolidates the countries and certain other geographical entities of America North of Mexico from that Index. These are shown on the adjacent map.

The numbers of countries and other localities in America North of Mexico are listed in order. For example, when 62 is entered, it stands for Canada, and 323 stands for the United States. Where the author or authors have not recorded a specific country, an inclusive title is entered, e.g., 351 for North America. This is the purpose of the Index: to identify the countries or other locations represented by numbers under DISTRIBUTION (Table 1 or Table 2).

---

*B. V. Travis, Herbert H. Casewell, Jr., William B. Rowan, Helle Starcke, and Carl W. Ross: Classification and coding system for compilations from the world literature on insects and other arthropods that affect the health and comfort of man, Technical Report ES-4, U.S. Army, Quartermaster Research & Engineering Center, Natick, Mass., 259 pp., 1962.

GEOGRAPHICAL INDEX

5. Alaska

7. Aleutian Islands

26. Arctic Circle, within the (Inclusive title)

62. Canada

126. Greenland

- Newfoundland, indexed under Canada, 62

250. Queen Charlotte Islands

- Queen Elizabeth Archipelago, indexed under Canada, 62

260. Saint Pierre and Miquelon Islands

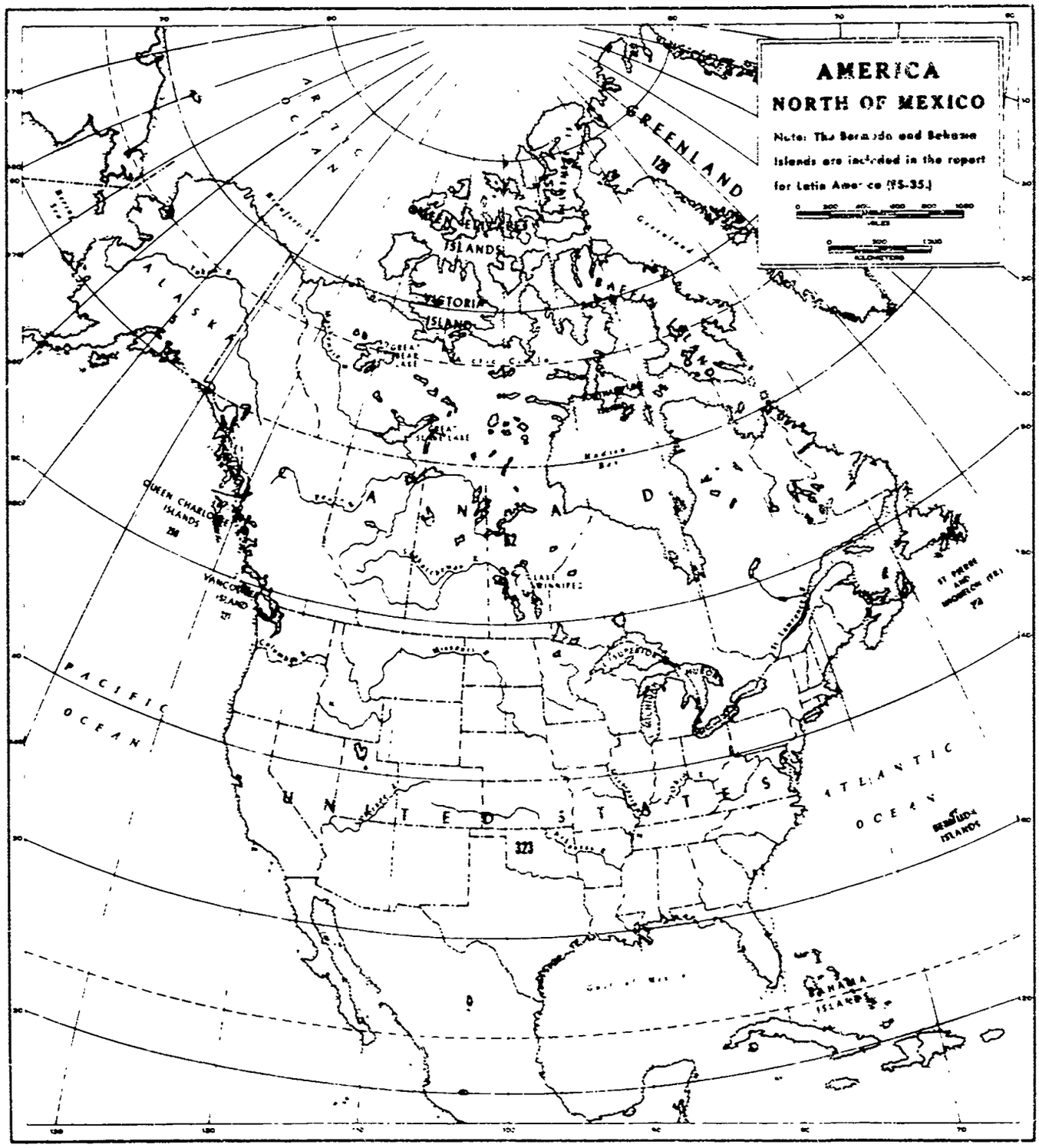
323. United States (excluding Alaska and Hawaii*)

327. Vancouver Island

351. North America (Inclusive title)

---

*Hawaii is indexed in Technical Report ES-36, "Arthropods of Medical Importance in Australia and the Pacific Islands".


AMERICA
NORTH OF MEXICO
Note: The Bermuda and Bahama Islands are included in the report for Latin America (FS-35.)
MILES
KILOMETERS
ARCTIC OCEAN
GREENLAND
ALASKA
CANADA
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
VICTORIA ISLAND
QUEEN CHARLOTTE ISLANDS
VANCOUVER ISLAND
ST PIERRE AND MIQUELON (FR)
BERMUDA ISLANDS
BAHAMA ISLANDS
GULF OF MEXICO

ARTHROPOD DATA

A. MOSQUITOES

The mosquito entries include information on the biology of the larvae and adults in addition to distribution and disease transmission. There are fewer species of mosquitoes (361) in America North of Mexico than in the other continents. However, the tabulations show that almost all species have a large documentation of their biology.

So many mosquitoes will bite man that an effort has been made to make a complete listing of mosquito species and subspecies. The synonymy is a difficult problem in this group; thus, some species and subspecies in the list are not valid names.

TABLE 1 - MOSQUITOES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
abfitchii (Felt)	---; meadows, timbered parts of river; 323	Headlee	1945
abcriginis Dyar	Roadside borrow pits devoid of vegeta n; ---; 5	Gjullin et al.	1961
	---; ---; 5, 62 (Forest pools, ditches, excavations)	Dyar	1928
	Snow pools in deep woods; deep forests, rare; 62°	Hearle	1926
	Semi-stagnant pools, drainage pools, artificial pools; ---, 62	Dyar	1920
	---; March, May-July; 62	Hearle	1927
	---; ---; 62 (Early spring pools of foul character, in deep forest and shaded by large trees, bite by day or night)	Dyar	1921
	Shallow waters containing vegetation debris; May, June; 323	Irwin	1943
	Small temporary rain pools; common in some areas; 323	Stage et al.	1952
	Early forest pools; ---; 323	Matheson	1944
absermatus (Felt & Young)	Shallow temporary pools in swampy woodland wagon track; May; 62	Twirn	1926
	---; ---; 62, 323 (Ditches, heath and alder bogs, bite man, April-June)	Steward & McWade	1961
	Low, swampy woodlands and mountain pools; April-May; 323	Headlee	1945
	---; bite all day, June; 323°	Wallis	1960
aegypti (Linnaeus)	---; ---; 62°	Downe et al.	1963
	Domestic, artificial containers in or near dwellings, treeholes, underground street catch basins, prefer fairly clean water; troublesome house pest, all day mostly early morning and late afternoon; 323**°	King et al.	1960
	Just above the water line or on the surface of the water; vigorous biters and attack man quietly, all year; 323	Matheson	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *aegypti* (Linnaeus) (cont.)	Lake shores; carrier and possible vector of yellow fever and dengue fever; 323	Quinby	1941
	More numerous in the substandard areas of towns and cities, prefer abandoned automobile tires to other artificial containers; ---; 323	Tinker	1964
	---; bites man severely on knuckles, ankles and elbows; 323	Komp	1923
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; light trap; 323	Chamberlain et al.	1964a
aestivalis Dyar	---; Sept; 62	Dyar	1920
	In flood water of lakes, June-July; 323	Dyar	1922
albertae Dyar	Early spring ground pools; ---; 62	Dyar	1922
aldrichi Dyar & Knab	Temporary snow pools; ---; 5	Tulloch	1934
	Cottonwood swamps, river flood-pools; in woods, houses, bite all day, mostly at dusk, vicious and painful, very abundant; 62*	Hearle	1926
	Flooded low areas, overwinter in river border; ---; 62	Hearle	1921
	---; June-Sept.; 62	Hearle	1927
	---; ---; 62 (Flood pools shaded by bushes, in river bottoms)	Dyar	1921
	Ground depressions in the cottonwood bottom lands in river valley which will be flooded by the spring freshets, backwaters of streams with little or no current; enters houses; 323*	Mail	1934
alleni Turner	Tree holes; ---; 323	Matheson	1944
	---; June-July; 323*	Rozeboom	1942

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *aloponotum* Dyar	Cold early spring pools; forested coastal regions; 62, 323	Dyar	1928
	---; in woods, May-Aug., fairly common; 62°	Hearle	1926
alpinus (Linnaeus)	Summer ground pools; ---; 5	Dyar	1922
	---; ---; 5, 62, 126 (Snow and ice pools)	Dyar	1928
altiusculus Dyar	Early snow pools on mountain meadows; June, Aug.; 323	Dyar	1922
atlanticus Dyar & Knab	Shaded woodland or clear, grassy pools, shallow pool in marl soil with thick growth of *Sesuvium*; severe biter in and near woods, abundant; 323°	King et al.	1960
	Pot hole; bites by day; 323	Bick	1946
	Temporary pools; March-Nov.; 323	Carpenter et al.	1946
	Wagon-wheel rut along the border of a fresh-water swamp; ---; 323	Darsie et al.	1951
	Temporary or semi-permanent rain pools in wooded areas; ---; 323	Rozeboom	1942
	---; light trap; 323	Dow et al.	1964
atlanticus tormentor Dyar & Knab	---; April-Jan.; 323	Carpenter & Chamberlain	1946
	---; light trap; 323	Chamberlain et al.	1964 a
atropalpus (Coquillett)	---; ---; 62, 323 (Rocky streams, overflow pools, rain-filled depressions, adults resting under rock edges and biting during daytime hours, experimental vector of equine encephalitis, Feb., Mar., Sept.-Dec.)	Carpenter et al.	1946
	---; ---; 62. Tree holes; ---; 323 (Rock holes and small pools along rivers and streams, especially after spring floods, persistent biters, June-Sept.)	Steward & McWade	1961
	Rock holes along mountainous streambeds, in rocks away from streams, pot holes, tree holes, artificial containers; rare; 323°	King et al.	1960
	Abandoned septic tank; ---; 323	King et al.	1939

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES atropalpus (Coquillett) (cont)	Pot holes and rock holes along streams and lakes, filling of rock pools by rains, high water or waves, attached to rock above water level; ---; 323	Lowry	1929
	Small pot holes along rapids in rivers, rock pools along lake shore; ---; 323	Owen	1937
	Pot holes near falls; ---; 323	Dickinson	1944
	Swampy area; ---; 323	Knutson	1943
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; June-Sept.; 323	Matheson	1944
	---; Aug.-Oct.; 323	Carpenter et al.	1945
aurifer (Coquillett)	---; June; 62 (Early spring pools, rare)	Dyar	1921
	---; ---; 62 (Roadside and woodland pools, more often in bogs and marshes, bite freely all day and in the evening, April-mid-summer)	Steward & McWade	1961
	Early spring woodland pools, associated with cranberry bogs; bite in shade during day and early evening; 323°	Matheson	1944
	Large and permanent woodland pools, meadows, lakes; Mar.-Aug., bites fiercely at times; 323	Headlee	1945
	Temporary pools in spring, especially open bogs and swamps; rare; 323	Lowry	1929
	Early spring snow-water pools; Sept.; 323	Dickinson	1944
	Roadside pools derived from melting snow; ---; 323	Owen	1937
	Flooded, river pools, in cranberry bogs; ---; 323	Knutson	1943
	Shallow waters containing vegetation debris; ---; 323	Irwin	1943
	Open marsh pool, ditches; ---; 323	Lake	1953
	Near cypress swamp; ---; 323	Ross	1947

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
barri Rueger	---; ---; 62, 323	Stone	1965
bicristatus Thurman & Winkler	Early spring flooded meadows; ---; 323°	Freeborn & Bohart	1951
bimaculatus (Coquillett)	Muddy rain pools; Aug.; 323	Rozeboom	1942
	Roadside pools; ---; 323	Matheson	1944
	---; fierce biter, common; 323°	King et al.	1939
	---; rare, June, Sept.; 323	Beyer	1923
cacothius Dyar	---; ---; 323°	Dyar	1923
callithotrys Dyar	---; June; 5. ---; June, July; 62	Dyar	1920
campestris Dyar & Knab	---; ---; 5. (Pools, water filled depressions containing alkaline and rich organic contents, rest in grass and bite when disturbed)	Steward & McWade	1961
	Common in alkaline water rich with organic matter; bites when disturbed, bites readily in hot afternoons and in the evening; 62	Rempel	1953
	Shallow open pools in marshy meadow; invade living quarters to bite, active all day through sunset; 62°	Twinn et al.	1948
	Temporary snow and rain pools; prairie, open grassland; 62	Twinn	1949
	Irrigated areas, pools with high salt concentration; May-Sept.; 62	Shemanchuk	1959
	Grassy low-lying places; ---; 62	Rempel	1950
	Open pools, ditches; ---; 62	McLintock	1944
	---; ---; 62. ---; abundant; 323 (Bite by day or night)	Dyar	1921
	Shallow pools filled from melting snow or early vernal rains; semi-arid plains and prairie, abundant during late spring and early summer, bite freely at any time, most active in the evening and early morning; 323°	Rees	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS: ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES campestris Dyar & Knab (cont.)	Semi-arid plains, prairies, alkaline waters, overflow of irrigation water, depressions; active in evening and morning hours, severe biter; 323	Matheson	1944
	Only in the spring; feed at any time but are more active at dusk, May to Nov.; 323	Rees	1934
	Open, unshaded waters; bite all day and during darkness, rare; 323	Stage et al.	1952
	Early spring snow-water pools; April; 323	Dickinson	1944
	Alkaline pools in arid plains; ---; 323	Mail	1934
	Marsh; ---; 323	Owen	1937
canadensis (Theobald)	---; ---; 5°	Gjullin et al.	1961
	Abundant near the northern edge of the aspen grove lands, rare in the coniferous forest zone; bite readily and most annoying in dense poplar bluffs, May-July; 62°	Rempel	1953
	Woodland pools; in woods, severe biter, Sept., very rare; 62	Hearle	1926
	Open pools; in houses; 62	McLintock	1944
	---; April, July-Sept.; 62. ---; ---; 323. ---; in forested regions; 351 (Any standing water, large or small, in and near woods, bogs and swamps in forest regions, ready biters, all summer)	Steward & McWade	1961
	---; ---; 62. Artificial pools; readily attack towards the evening, pest in woodlands; 323° (Woodland pools with decaying leaves, roadside puddles, spring fed pools, cranberry bogs, sphagnum bogs, pools, wooded swamps and open meadows, ice-covered ponds, common in May-June)	Matheson	1944
	---; ---; 62, 323 (Transient ground puddles, open woods, pools and roadside ditches, active after sunset, bites low near the ground)	Dyar	1922
	---; ---; 62, 323 (Temporary ground pools in shade)	Dyar	1928

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES canadensis (Theobald) (cont.)	Temporary forest pools flooded by melting snow, depressions with decaying leaves and debris, in open meadow at high elevation; bites severely, mostly late afternoon in large wooded areas, rare in some areas; 323°	Stage et al.	1952
	Woodland pools, seepage water from spring floods, post oak flats along river, stump holes, small sink holes, oxbows of small woodland streams; fierce biter, bites readily in shade all day; 323	Ross	1947
	Marshy ground pools near edge of forests; forested areas above 8000 feet elevation, bites during daytime near shaded woodland pools; 323	Harmston	1949
	Woodland pools containing decaying leaves, in small streams and ditches; rarely enter houses; 323	Carpenter et al.	1946
	Woods, pools, streams; abundant March; 323	Horsfall	1936
	Roadside ditches, ground puddles, pools caused by overflow of river with bottoms covered with dead leaves and grass; ---; 323	Mail	1934
	Temporary or intermittent waters of spring pools and stream bed pools, artificial containers floating in city dumping pond; ---; 323	Rowe	1942
	Alkaline pools, ponds, lake margins in valley, irrigated field; ---; 323°	Chapman	1966
	In pools on sphagnum mats, cold permanent swamp pools; ---; 323	Irwin	1943
	Shallow, semi-permanent ponds in open fields; ---; 323	Good	1945
	Pasture pools, heavy rain-filled pools; ---; 323	Lowry	1929
	Temporary rain pools in the open; ---; 323	Dickinson	1944
	Fresh water pond, cranberry bog; ---; 323	Bast	1963
	Swamps, root holes; ---; 323	Knutson	1943
	Shaded pools; ---; 323	Owen	1937
	Salt marsh; ---; 323	Ferrigno & Bast	1962

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *canadensis* (Theobald) (cont.)	---; all year; 323	Carpenter & Chamberlain	1946
	---: common; 323	King et al.	1939
canadensis *canadensis* (Theobald)	---; ---; 5, 62, 323	Stone	1965
	Woodland pools, shaded pools with dead leaves, roadside puddles, spring-fed pools, cranberry bogs, pools in open sphagnum bogs, wooded swamps and open meadows, water pits, receding river flood waters; abundant; 323°	King et al.	1960
canadensis *mathesoni* Middlekauff	---; ---; 5	Stone	1965
	Deep shaded fox holes; rare; 323	King et al.	1960
cantans Meigen	---; ---; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
excitator (Coquillett)	Brackish water; ---; 62	Twinn	1944
	Salt marshes; ---; 62	Hearle	1926
	---; ---; 62 (Salt coastal pools)	Dyar	1928
	Salt marshes, brackish and fresh water pools; bite by day in open at night in houses, March; 323°	Wallis	1960
	Coastal marshes, along margins of streams and rivers, in cranberry bogs, saline pools; ---; 323*	Matheson	1944
	Brackish water in salt holes on marsh; ---; 323	Stearns et al.	1933
	Drainage from highlands; ---; 323	Headlee	1945
	---; during day in shrubbery or long grass, flies at dusk, persistent and vicious biter; 323	Lowry	1929
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952
	---; April-Oct.; 323	Barnes et al.	1950
cataphylla Dyar	Shallow temporary or semi-permanent pool; ---; 5	Gjullin et al.	1961
	---; ---; 5, 323 (Early spring pools, males swarm in open country, bites both day and night)	Dyar	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *cataphylla* Dyar (cont.)	Small grassy depressions sheltered by bluffs; active day and night; 62°	Rempel	1953
	Irrigated areas; ---; 62	Shemanchuk	1959
	---; April-Aug.; 62	Hearle	1927
	---; very rare; 62	Hearle	1926
	---; forest; 62	Twinn	1949
	---; ---; 62 (Grassy pools along riverbanks)	Dyar	1928
	Snow and flood water pools in the wooded sections of the mountains at elevations usually above 7,500 feet; May-July, Aug., bites readily, important pest in high mountain areas; 323°	Rees	1943
	Flooded pools in wooded regions; common in early spring-Aug.; 323	Matheson	1944
	Mountains; vicious biter also in sunshine, rare; 323	Stage et al.	1952
	Snow pools in wooded sections of mountains, grassy pools along river banks; ---; 323	Mail	1934
	---; mountains at 10,000 feet elevation, bite readily in the wooded areas; 323	Harmston	1949
cataphylla *cataphylla* Dyar	---; ---; 5, 62, 323	Stone	1965
cataphylla *pacificensis* Hearle	---; ---; 62	Stone	1965
cinereoborealis Felt & Young	Shallow leafy woodland pools; May and June; 62	Twinn	1926a
	---; ---; 62. ---; April, May; 323 (Early spring pools, in forest and leafy shaded ditches along roads)	Dyar	1922
	---; ---; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
cinereus Meigen	Vernal snow-melt pools; ---; 5°	Frohne	1954
	---; abundant; 5	Frohne	1956
	Cottonwood flood swamps, shallow protected surface pools and ditches with clean water, snow and rainpools; common; 62	Hearle	1926

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES cinereus Meigen (cont.)	Open woodland flooded by river; painful biter, May-July; 62°	Twinn	1926a
	Open pools, sloughs, ditches; woods; 62	McLintock	1944
	Common at the northern edge of the aspen grove region; ---; 62	Rempel	1953
	Flood pools, along river banks; ---; 62	Dyar	1920
	Irrigated areas; ---; 62	Shemanchuk	1959
	---; ---; 62 (Woodland pools, rain puddles, marshes, and bogs, April)	Steward & McWade	1961
	Shaded pools at high and low altitudes; attack by day and at dusk close to the ground and underbrush, March, abundant; 323	Stage et al.	1952
	Floodwater and woodland pools; in weeds and grasses near dwellings, a pest in some areas, rare; 323	King et al.	1960
	Small waterholes in glacial bogs and marshes, woodland pools; crepuscular; 323	Ross	1947
	Temporary grassy pools; peak May; 323	Knutson	1943
	Pools in coniferous forests, woodland pools in the hardwood region, temporary rain pools which are unshaded, open bogs, marshes; ---; 323	Owen	1937
	Shallow waters containing vegetation debris, margins of deeper pools; ---; 323	Irwin	1943
	Spring woodland pools with decaying leaves; ---; 323	Matheson	1944
	Various temporary ground pools, rain-filled pools; ---; 323	Lowry	1929
	Early spring snow-water pools, swamp pools; ---; 323	Dickinson	1944
	Seepage water, roadside ditches; ---; 323	Mail	1934
	Shallow woodland pools; ---; 323	Stearns et al.	1933
	---; along the foothills of higher mountain ranges near wooded streams, persistent biter in wooded areas during daytime; 323°	Harmston	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *cinereus* Meigen (cont.)	---; April-Oct.; 323	Fellton et al.	1950
	---; light traps; 323	Carpenter et al.	1945
cinereus form *fuscus* Osten Sacken	---; June-Aug.; 62	Hearle	1927
cinereus *hemiteleus* Dyar	Early spring pools, shallow grassy and sunlit or in deep forest; rather walk than fly, crawl on vegetation and attack the legs; 323°	Freeborn	1926
classicus Dyar	Ground pools; May; 323	Dyar	1922
communis (De Geer)	Breeds in water at 2°-3° C., dry basins of vernal pools or along dried margins of less transient standing water, brushy inclusions of tundra and alpine meadows; ---; 5°	Frohne	1956
	Shallow, temporary pools; forest; 5	Gjullin et al.	1961
	Area covered with brushy shrub, moss and grass; ---; 5	Gjullin & Cross	1951
	Temporary snow pool; ---; 5	Tulloch	1934
	---; May-Aug.; 5	Weber	1950
	---; abundant; 5	Hopla	1965
	---; ---; Swamps and marshes; ---; 323 (Early spring pools, remain in shade and bites after dark)	Matheson	1944
	Oxbow lakes and bog pools in shaded spruce forest with decaying logs and branches, rock pools with humus and moss; bite in spruce forest and willow thickets, open tundra meadows and mountain valleys at 1000 feet elevation all day and early evening, one of the most abundant and worst pests; 62°	Jenkins & Knight	1950
	Shallow snow pools in swampy coniferous forest; bites man on a sunny day and also in the evening; 62	Twinn et al.	1948
	---; deep wooded valley with a large stream and unusually dense balsam fir and black spruce; 62	Brown	1951

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *communis* (De Geer) (cont.)	---; April-Aug.; 62	Hearle	1927
	Flooded mountain, meadows and woodland pools left by melting snow, mountain lake margins; high mountain areas, vicious biters, especially at dusk, abundant; 32°°	Stage et al.	1952
	Spring pools in woodlands and swamp; common in wooded areas, flying around garden and porches; 323	Lowry	1929
	Natural pools, early-drying pools among aspens, beach pools and shallow swamp pools; April-Aug.; 323	Irwin	1943
	Shallow depressions; prefers shade; 323	Freeborn & Bohart	1951
	Low-lying grassy pools about the lake and in the edges of small ponds; ---; 323	Dyar	1924
	Woodland pools filled by melting snow with bottom covered with leaves; ---; 323	Carpenter	1950
	Temporary pools in coniferous forests; ---; 323	Owen	1937
	---; bite in wooded areas during daytime and open areas at evening; 323	Harmston	1949
communis *communis* (De Geer)	Shaded overflow pools adjacent to streams, shaded streambeds; pine and aspen situations, 5,000-7,000 feet elevation, March-June; 323°	Chapman	1966
communis *nevadensis* Chapman & Barr	Open and shaded pools in mountains at 7,200-8,700 feet elevation, overflow pools adjacent to streams, open meadow pools of snow melt; annoying at 8,000-9,500 feet elevation, May-June; 323°	Chapman	1966
communis *tahoensis* Dyar	Deep mountain meadow pools; prevalent above 5,000 feet elevation; 323	Freeborn	1926
consobrinus Robineau-Desvoidy	---; ---; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
curriei Coquillett	Rock pools with brackish water and salt marshes; along the Coast and outlying islands; 62°	Hearle	1921 a
	---; May-Aug.; 62 (Early ground puddles, persistent biter, abundant after sunset)	Dyar	1921

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *curriei* Coquillett (cont.)	Temporary and permanent pools, irrigation water, irrigation overflow; abundant, May-Sept.; 323°	Parker	1916
cyclocerculus Dyar	---; ---; 5 (Muskeg pools)	Dyar	1928
	Muskeg pools; June and Aug.; 62	Dyar	1920
	---; May; 62	Hearle	1927
	---; coast; 323	Seguy	1924
dorsalis Say	Salt marshes, flooded tidal marshes, pools; ---; 323	Dyar	1907
dectiens Howard, Dyar & Knab	Black spruce bog pools; ---; 5	Gjullin et al.	1961
	In quaking bogs; ---; 5	Frohne	1956
	---; ---; 5, 62. Woodland pools and sphagnum bogs; ---; 323 (Rare, bites man)	Steward & McWade	1961
diantaeus Howard, Dyar & Knab	Semi-permanent pools, shallow marshy margins of permanent pools and ponds; ---; 5	Gjullin et al.	1961
	---; ---; 5°	Frohne	1956
	Small slough fed by springs with moss present; May; 62	Rempel	1953
	Temporary water, flood pools; ---; 62	Dyar	1920
	---; June and Aug.; 62	Hearle	1927
	---; forest; 62	Twinn	1949
	---; ---; 62, 323 (Cold shaded pools, in forested areas especially in coniferous forest, bites all hours)	Matheson	1944
	---; ---; 62 (Rare, in woods)	Dyar	1928
	---; ---; 62 (Snow pools in woods and forests)	Steward & McWade	1961
	Cold, shaded pools in the coniferous forest; swamps of the coniferous forest, May-July; 323°	Owen	1937
	Ground pools especially in spruce bogs; rare, in woods; 323	Lowry	1929

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
Aedes dorsalis Howard, Dyar & Knab (cont.)	Shallow waters containing vegetation debris; April; 323	Irwin	1943
	Early spring pools at high altitude in dense forest, flooded pool of river; ---; 323	Mail	1934
	Kettle hole; ---; 323	Wiedhass	1952
discolor (Coquillett)	---; rare, June-August; 323	Headlee	1945
dorsalis (Meigen)	Shallow weedy pool with alkaline water and rich in organic matter, a large dumping ground overgrown with wild barley and alkali grass, decaying hay straw, and manure; possible vector of Western equine encephalomyelitis, common in July-Sept.; 62°	Rempel	1953
	Coastal rock pools with high salinity, large salt marsh; seacoasts and islands, March-Aug.; 62	Hearle	1926
	Irrigated areas, temporary pools with alkaline water; in short-grass pastures all day, May-Sept.; 62°	Shemanchuk	1959
	Temporary snow and rain pools, tidal pools; prairie, open grassland; 62	Twinn	1949
	Alkaline pools in open pasture areas; ---: 62	Rempel	1950
	Open pools, ditches; ---; 62	McLintock	1944
	---; dominant in the great plains; 62. Rice-fields and flood waters; spring and autumn; 323 (Salt marshes of the coastal areas, open and unshaded, alkaline, saline and fresh water, especially irrigation)	Matheson	1944
	---; ---; 62, 323 (Coastal salt marshes, inland flood and irrigation water, vicious biters, attack day and night but most active toward the evening and on calm cloudy days)	Carpenter et al.	1946
	Open sunny areas flooded by saline, alkaline or fresh water, salt marshes; most abundant and troublesome in irrigated meadows and inundated grasslands, enter houses, attracted to light traps, naturally infected with western equine encephalomyelitis and St. Louis encephalitis viruses, experimental vector of Japanese B and California encephalitis viruses; 323°	Stage et al.	1952

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES dorsalis (Meigen) (cont.)	Water of high alkalinity, water or damp depressions, roadside ditch, irrigation ditch, open, temporary grassy pool, semi-permanent pools containing cattails and other hydrophytic vegetations, woodland pools deeply shaded with willows; April-Nov.; 323	Mail	1934
	Swampy areas, irrigated regions, lake surrounded by extensive flood areas, alkaline and fresh water, grassy pools; enter houses occasionally, vicious biter, in light trap, capable of transmitting western equine encephalitis; 323	Tate & Gates	1944
	Open ground pools, particularly in salt grass flats flooded with rain or irrigation water; bites at any time, most common pest in the valleys and deserts; 323	Rees	1934
	Temporary waters of stream bed pools, pasture pot holes and flooded areas, fluctuating marginal areas or marshes; experimental transmitter of equine encephalomyelitis; 323	Rowe	1942
	Water contaminated by industrial waste, saline waters from oil wells, seepage areas from factories; fierce biter, crepuscular; 323°	Ross	1947
	Inland fresh water and salt marsh drainage ditches; Jan.-March; 323	Herms	1934
	Brackish and fresh water; rare; 323	King et al.	1960
	Salt marshes, open, sunny pools subject to intermittent flooding; ---; 323	Freeborn & Bohart	1951
	Along margins of salt lake with 12% salinity; ---; 323 (Tolerate semi-exposed situations, prairies, shallow weedy alkaline pools rich in organic matter)	Steward & McWade	1961
	Foul, stagnant pools contaminated with sewage; ---; 323	Olson & & Keegan	1944
	Temporary, exposed pools, foul, stagnant water; ---; 323	Owen	1937
	Alkaline pools or lakes; ---; 323	Dickinson	1944
	Salt water pools; ---; 323	Rozeboom	1942

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES dorsalis (Meigen) (cont.)	Irrigation pool; ---; 323	Aitken	1940
	---; common in summer and autumn; 323	Barber	1939
	---; common in plains; 323	Harmston	1949
dupreei (Coquillett)	Temporary rain pools in post oak flats along the river; ---; 323	Ross	1947
	Temporary pools; ---; 323	Matheson	1944
	Grassy pond; ---; 323	Shields	1938
	---; in open woods, topelo gum bottom, April-Oct., in light traps; 323°	Breeland et al.	1961
	---; rare, Feb.; 323	Beyer	1923
	---; March-Aug.; 323	Wirth	1947
	---; June-Nov.; 323	Carpenter & Chamberlain	1946
dyari Coquillett	---; May; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
dysanor Dyar	Early spring pools; April-May; 323	Dyar	1922
epactius Dyar & Knab	Rock holes along streams; Aug.; 323	Dyar	1922
eupolcamus Dyar & Knab	---; ---; 323	Pritchard et al.	1947
excrucians (Walker)	Semi-permanent pools; ---; 5°	Gjullin et al.	1961
	---; ---; 5, 62, 323 (Early spring water, woods pools and marshes, most of the summer)	Dyar	1922
	Unshaded sedge marshes, bog pools, vegetated rock pools with much humus and organic debris, sometimes in snow melt and bare rockpools, shaded depressions with decaying branches surrounded by heath and low birch; June-Aug.; 62	Jenkins & Knight	1950
	Shallow grassy pools in wooded areas, in open swampy forest and tundra meadow; active day and night; 62°	Twinn et.al.	1948

TABLE 1 MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES excrucians (Walker) (cont.)	---; April-July; 62 (Woodland pools, swamps, bogs, grassy marshes, bite during day in woods, most active in evening, common, Sept.)	Steward & McWade	1961
	---; in woods; 62	Downe et al.	1963
	---; prairie wooded areas; 62°	Twinn	1949
	Swampy ground surface pools in vicinity of timber; mountain regions at lower elevations, feed in the woods at any time during the day, most active in the evening; 323°	Rees	1943
	Natural pools and partly shaded ones; in woods during day, in houses in early morning and in the evening, bite day and night, April; 323	Irwin	1943
	Spring pools in woodland and swamp; common in wooded areas, active at dusk flying around gardens and porches; 323	Lowry	1929
	Roadside ditches bordered by brush, pot holes in open meadows, temporary pools, open and semi-wooded areas; July; 323	Stage et al.	1952
	Woodland pools, temporary roadside and pasture pools, cold, shaded pools in the coniferous forest; feeds in the shade at all times; 323	Owen	1937
	Swamp waters, grassy marsh pools; May-Oct.; 323	Dickinson	1944
	Swamp pools; in houses, in light trap; 323	Knutson	1943
	Spring pools in marshes and bogs, marshes bordering woods; ---; 323	Ross	1947
	Flooded marshes; ---; 323	Matheson	1944
	---; April-Aug.; 323	Fellton et al.	1950
fisheri Dyar	Early spring pools; June; 323	Dyar	1922
fitchii (Felt & Young)	Semi-permanent pools; ---; 5	Gjullin et al.	1961
	---; July; 5. ---, July-Sept.; 62	Dyar	1920
	---; ---; 5°	Frohne	1956
	Woodland pools; common. May-July; 62	Rempel	1953
	Railroad ditches, open pools; ---; 62	McLintock	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES fitchii (Felt & Young) (cont.)	Early spring water; ---, 62	Dyar	1922
	Pool near bluffs; ---; 62	Rempel	1950
	---; prairie, wooded areas; 62°	Twinn	1949
	---; ---; 62. Forests; ---; 351 (Temporary and semi-permanent grassy pools, in deeper water than other species, bite man, May, June & Aug.)	Steward & McWade	1961
	Snow-waters, open meadow pools and ponds, open marshy lake margins at 6,500-8,700 feet elevation, shaded meadow pools, open overflow pools at 5,000-6,000 feet elevation; bite in partially shaded woods; 323	Chapman	1966
	Margins of semi-permanent ponds, temporary open pools, woodland pools, occasionally in open bogs; bites freely during day time in the shade and at dusk; 323°	Owen	1937
	Flooded meadows or pot holes in semi-wooded areas; mountainous regions and near sea level, abundant; 323	Stage et al.	1952
	Open marshes; April-Oct.; 323	Ross	1947
	Meadows; rare; 323	Headlee	1945
	Early spring pools, especially grassy edges of swamps; ---; 323	Lowry	1929
	Early spring snow-water pools, edges of ponds and marshes; ---; 323	Dickinson	1944
	Spring pools, wooded swamps, open marshes; ---; 323	Matheson	1944
	Flooded meadows or tule pools; ---; 323	Freeborn & Bohart	1951
	Mat pools, beach pool; ---; 323	Irwin	1943
	Early spring pools; ---; 323	Barnes et al.	1950
	Cranberry bog; ---; 323	Carpenter	1950
	Swamp pools; ---; 323	Knutson	1943
	---; abundant in foothill regions and wooded areas of higher mountain valleys, bite readily, particularly in evening; 323	Harmston	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES fitchii mimesis Dyar	Grassy marshes. shallow water of small pond; June; 323	Dyar	1924
fitchii palustris Dyar	---; coastal areas; 5, 62. Shallow grassy pools; up to 9,000 feet altitude, bite viciously day and evening and on bright moonlit nights, July; 323°	Freeborn	1926
	---; April and July; 62	Hearle	1927
flavescens (Müller)	Shallow pools from melting snow and ice; active June-Aug.; 5	Gjullin et al.	1961
	Brackish water; ---; 5	Fronne	1954
	---; ---; 5, 62, 323 (Spring pools, flooded grassy marshes, open prairies, vicious pest to man)	Matheson	194-
	Irrigated areas; May-Sept.; 62°	Shemanchuk	1959
	Heavily overgrown and partly shaded semi-permanent pools in open prairie; ---; 62	Rempel	1950
	Semi-permanent water in small grassy sloughs overgrown with sedges, in stagnant, alkaline water hemlock; ---; 62°	Rempel	1953
	Common in the prairie provinces, rare in others; ---; 62 (Semi-permanent waters, meadow pools and marshes, bite readily)	Steward & McWade	1961
	Temporary snow and rain pools; ---; 62	Twinn	1949
	Ditches; ---; 62	McLintock	1944
	Deep pools in meadows and marshes, alkaline pools, flooded marshes of prairie regions; vicious biters, feed in the open any time during the day or early evening; 323°	Rees	194-
	Early spring snow-water pools; Aug., Oct.; 323	Dickinson	1944
	Irrigation ditches; April-July; 323	Mail	1934
	Marshy habitats, temporary pools in exposed places; ---; 323	Owen	1937
	Plains, meadow pools and marshes near alkaline flats; abundant; 323	Stage et al.	1952
	Beach pool; ---; 323	Irwin	1943
	---; in grassy, plains regions; 323	Harmston	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *fletcheri* Coquillett	---; May-Aug.; 62. ---; ---; 323 (Larger ground pools on the prairie in early spring)	Dyar	1921
fluviatilis (Lutz)	Rock holes along streams; ---; 323°	Dyar	1922
fulvus *fulvus* (Wiedemann)	---; ---; 323	Lane	1953
fulvus *pallens*	Temporary pools and semi-permanent sink holes, exposed turbid pools in low wooded area; severe biter at dawn or dusk, June-Oct.; 323°	Breeland et al.	1961
	Temporary pools in dense woods; near dwellings; 323	King et al.	1960
	Rain pool in the post oak flats; ---; 323	Ross	1947
	Small pools; ---; 323	Matheson	1944
	---; April; 323	Wirth	1947
fusca Osten Sacken	Pools, both woodland and open; rare, spring; 323	Headlee	1945
galloisi Yamada	---; ---; 62	Stone	1961
gonimus Dyar & Knab	---; June; 323	Dyar	1922
grossbecki Dyar & Knab	Early spring pools; fierce biters, rare; 323°	Carpenter et al.	1946
	Semi-permanent woodland pools in sloughs; Jan., Feb.; 323	Wirth	1947
	Post oak flats along river; April-June; 323	Ross	1947
	Woodland pools and marshes: spring; 323	Wallis	1960
	Lake margins; Aug.; 323	Fellton et al.	1950
	Breeds away from the seacoast; ---; 323	Darsie et al.	1951
hendersoni Cockerell	---; ---; 323	Stone	1965

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
newitti Hearle	---; July and Aug.; 62	Hearle	1923
hexodontus Dyar	Semi-permanent pools; tundra; 5°	Gjullin et al.	1961
	Carex marshes; ---; 5	Knight	1951
	Arctic tundra, clear water in alpine meadows at 1,000 feet elevation in unshaded snow melt pools and rock pools with much sedge, grass and sphagnum moss; pests in mountains, tundra meadows and near snowbanks, bite all day in sun and shade, June and July; 62°	Jenkins & Knight	1950
	Open or partially shaded meadow pools, ponds, marshy lake margins at 6,300-10,000 feet elevation; major pest in mountainous areas, March-July; 323	Chapman	1966
	Shallow pools in meadows or marshes or along streams; active after sunset behind bushes and tree trunks; 323	Dyar	1922
	Spring pools, hoofprints, tiny depressions of seepage areas, snow water in flooded meadows; ---; 323	Matheson	19--
	Small pools; ---; 323	Freeborn & Bohart	1951
	---; vicious biter in shade by day, common in some areas; 323°	Stage et al.	1952
hirsuteron Theobald	Low wooded areas flooded in spring by river; troublesome biter; 62°	Twinn	1926a
	Exposed ditches; houses, bush, May-Aug.; 62	McLintock	1944
	---; ---; 62 (Flood pools, with dead vegetable matter)	Dyar	1928
	Sometimes in early woodland pools; June, July; 323	Lowry	1929
	Flood pools of river valleys, depressions containing leaves and grasses, rain-filled pools in woods, hollows filled with rank weeds and rubbish filled by seepage from river; ---; 323	Mail	1934

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *hirsuteron* Theobald (cont.)	Shaded forest pool, temporary rain pool, ---; 323	Owen	1937
	---; ---; 323°	Shields	1948
idahoensis (Theobald)	Temporary snow and rain pools; prairie, open grassland; 62	Twinn	1949
	---; June and Aug.; 62	Hearle	1927
	---; ---; 62, 323 (Early spring pools, in open country, swarming over prominent objects after sunset)	Dyar	1921
	---; ---; 62, 323 (Spring rainpools, in arid regions and river valleys without grass)	Dyar	1928
	Early in the spring in snow water pools or pools filled by early vernal rains, rock pockets filled with water from melting snow, pools showing a high alkalinity; open plains and low mountain regions, bite readily during the day, more active in the evening, April-May; 323°	Rees	1943
	Roadside of river overflow, flooded meadow; common on dry plains, May; 323	Dyar	1929
	Irrigated areas; abundant in some areas; 323	Stage et al.	1952
	Pools in grassy meadow; ---; 323	Dyar	1924
	---; troublesome pest in plain areas and lower mountain valleys, June-Aug.; 323	Harmston	1949
impiger (Walker)	Pools in sphagnum-heath bog, temporary pools; June-July; 5	Gjullin et al.	1961
	---; ---; 5°	Frohne	1956
	---; ---; 5, 62, 323 (Snow pools in the treeless regions of the arctic, commonest and worst species of the far north)	Steward & McWade	1961
	Grassy pool in poplar bluffs; ---; 62	Rempel	1950
	---; June-July, densely forested country; 62	Dyar	1920
	---; April, May and Aug.; 62	Hearle	1927
	---; ---; 62, 323 (Common in forested regions)	Rempel	1953

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES impiger (Walker) (cont.)	---; ---; 62 (In spring pools)	Dyar	1928
	Large mat pool exposed to sun, beach pool; in wooded sections during day, about buildings in the evening, rare, May; 323	Irwin	1943
	At 8000 feet elevation; Mar., June-July; 323°	Matheson	1944
	Temporary pools shaded by hardwood timber, cold, shaded pools in the dense coniferous forest, early, temporary snow pools in the open; ---; 323	Owen	191[illegible]
	Pools in semi-wooded areas at high altitudes; ---; 323	Stage et al.	1952
	Snow pools in woods and meadows; ---; 323	Mail	1934
	Earliest spring pools; ---; 323	Lowry	1929
	---; elevations of 6000 to 9000 feet, along mountain streams near willow growths; 323	Rees & Nielson	1951
implacabilis (Walker)	Bogs, forest pools in the surrounding low-lying areas; ---; 62	Brown et al.	1951
	Temporary leafy pools; bite all day, Mar.-May, 323°	Knutson	1943
	Sphagnum mats of shaded pools, tamarack and poison sumac bogs; crepuscular; 323	Ross	1947
	In sunlit pools, shaded swamp pools; ---; 323	Irwin	1943
	Early cold woodland pools; June; 323	Lowry	1929
	Early spring snow-water pools; ---; 323	Dickinson	1944
	---; May-July; 323	Blickle	1952
implicatus Vockeroth	Brackish water along coast; ---; 5. Coniferous forests; ---; 62. ---; ---; 323 (Temporary puddles of snow and rain water, bite readily in the evening and in woods at any time)	Steward & McWade	1961
	Temporary pools; ---, 5°	Gjullin et al.	1961
inconspicuus Grossbeck	Mountain, rock pool; Sept.-Oct.; 323	Headlee	1945

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES increpitus Dyar	Small slow-flowing streams in wooded valley and shallow woodland pools; bites readily in the woods by day. May; 62°	Rempel	1953
	Stagnant creek flowing through bluff country; ---; 62	Rempel	1950
	Snow water, at 4,300-8,200 feet elevation, open and shaded meadow pools and ponds, roadside ditches, open and shaded ponds, pool margins in foothills; principal pest in foothills and higher elevations, Feb.-Aug., 323	Chapman	1966
	Plains, open meadows and small pools in semi-wooded country from sea level to 6000 feet elevation, rain pools; prefer shade, abundant; 323	Stage et al.	1952
	Numerous in overflow pools along wooded streams; troublesome in wooded areas along foothills and higher valleys; 323	Harmston	1949
	Spring pools in river valleys and edges of lakes, active after sunset, over bushes and small trees; 323	Dyar	1922
	Overflow pools from irrigation ditches; fierce biter; 323°	Matheson	1944
	Flood pool, depressions along river banks in temporary pools; ---; 323	Mail	1934
increpitus form *hewitti* Hearle	---; June and July; 62	Hearle	1927
increpitus mutatus Dyar	---; April-June; 323	Dyar	1929
inequitus form *mutatus* Dyar	---; May; 62	Hearle	1927
infirmatus Dyar & Knab	Temporary woodland or open grassy pools; attack readily by day in and near woods, at night in and near houses, in light traps, naturally infected with western equine encephalitis, abundant; 323°	King et al.	1960
	Temporary rain pools; seldom enters houses; 323	Quinby	1941
	Mud holes under palmettos; woods; 323°	Beyer	1923
	---; March-Dec.; 323	Carpenter & Chamberlain	1946

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
inmaitus Dyar & Knab	---; ---; 126	Dyar & Knab	1917
intrudens Dyar	Temporary snow melt pools in open areas of black spruce muskeg; ---; 5°	Gjullin et al.	1961
	---; ---; 5. Common in the spruce forest; bite day and night; 62°	Rempel	1953
	Temporary water, snow pool; in houses and [illegible]ns; 62	Dyar	1920
	Shallow leafy woodland pools; ---; 62	Twinn	1926a
	Irrigated areas; ---; 62	Shemanchuk	1959
	Ditches; ---; 62°	McIntock	1944
	---; May-Aug.; 62 (Bogs and marshes, persistent biters)	Steward & McWade	1961
	---; deep wooded valley with a small stream; 62	Brown	1951
	---; wooded areas; 62	Rempel	1950
	---; ---; 62, 323 (In cold snow-pools and wet meadows, enter houses until July)	Dyar	1928
	In the ground in depressions in wooded regions, snow water pools floored with dead leaves and vegetation, in the spring and early summer; forest areas, bite by day or night; 323°	Rees	1943
	Ground pools formed by melted snow; enters houses freely; 323	Lowry	1949
	Pools among aspens and on mat, beach pools; April-Aug.; 323	Irwin	1943
	Grassy pool fed by snow-water; abundant; 323	Dyar	1924
	Woodland pools shaded by deciduous trees, open bogs, marshy localities, forest pools in dense shade of coniferous; ---; 323	Owen	1937
	---; Mar., bites mostly in May-July; 323°	Knutson	1943
	---; rare in some areas; 323	Stage et al.	1952
	Shallow woodland pools; ---; 323	M[illegible]son	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
iridipennis Dyar	---; Aug.; 323	Dyar	1922
jamaicensis (Theobald)	Open lot pools and woodland pools; July-August; 323	Headlee	1945
klotsi Matheson	Edge of small, cold, clear mountain stream; in tall grass in meadow, at 8300 feet altitude, July; 323	Matheson	1933
labradoriensis Dyar & Shannon	---; ---; 62	Dyar	1928
lateralis (Meigen)	Flood water in wooded river valley bottom; ---; 62	Twinn	1949
	---; ---; 62, 323 (Shaded floodwater areas covered with debris and growth of cottonwoods or willows, invade houses, bite by day and toward dusk)	Matheson	1944
	Shallow waters containing vegetation, debri , sunlit pools, shaded or partly shaded areas; May-July; 323	Irwin	1943
	Overflow pools .n wooded river bottoms; serious pest; 323°	Freeborn & Bohart	1943
lazarensis Felt & Young	---; June, July; 5	Dyar	1920
	Flood pool in cottonwood bottom land; very rare; 62	dearle	1926
	---; May-Aug.; 62 (Early ground pools in forest, flood pools, bites shortly after dark)	Dyar	1921
	Early ground pools in forest; active after sunset, April-July; 323°	Dyar	1922
leucocnotips Dyar	---; ---; 5 (Muskeg pools)	Dyar	1928
	Muskeg pools; June-July; 62	Dyar	1920
	---; May; 62	Hearle	1927
	---; coast; 323	Seguy	1924
masamae Dyar	Small pools along little streams, most numerous about the snow line; May, July; 323	Dyar	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES			
mathesoni Middlekauff	---; light traps, Aug.; 323	Carpenter et al.	1945
melanimor Dyar	Irrigated areas; ---; 62	Shemanchuk	1959
	Sloughs, roadside ditches, pot holes, irrigated fields; April-Feb.; 323°	Chapman	1966
	Temporary rain pools; ---; 323	Dyar	1928
mercurator Dyar	---; July; 62	Dyar	1920
mimesis Dyar	---; ---; 62. ---; July; 323 (Marsh pools in the spring)	Dyar	1922
mississippii Dyar	Tree stump; ---; 323	Dyar	1922
mitchellae (Dyar)	Open temporary pools, shallow depressions; light traps, severe biter, naturally infected with eastern equine encephalitis, rare; 323°	King et al.	1960
	Fresh water along coastal plain; ---; 323	Darsie et al.	1951
	Early spring pools of rainwater; ---; 323	Dyar	1928
	---; all year; 323	Carpenter & Chamberlain	1946
monticola Belkin & McDonald	---; ---; 323	Stone	1965
muelleri Dyar	---; in mountains at 6,100 feet; 323	Dyar	1928
mutatus Dyar	Rock pools filled by river freshets; persistent biter, all night, mostly at dusk, June-Aug., fairly rare; 62°	Hearle	1926
	River pools; ---; 323	Dyar	1922
nearcticus Dyar	Early summer ground pools; ---; 5	Dyar	1922
	---; May-Aug., surfaces of tundra pool; 5	Weber	1950
	Pools at 500-1000 feet elevation, clear water in small bogs and snow-melt pools above timberline in alpine meadows, unshaded pools of sedges, sphagnum and other mosses, rockpools; open rocky tundra areas and alpine meadows, it is the worst pest in the mountains, bite readily all day even in full sunlight and produce an immediate inflammatory reaction, June and July, abundant; 62°	Jenkins & Knight	1950

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS: ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES nearcticus Dyar (cont.)	Small shallow pools; ---; 62	Rempel	1953
	---; ---; 62 (Ground pools of arctic regions)	Dyar	1921
	High altitudes in the mountain in clear pools of melting snow water, ---; 323°	Mail	1934
	---; rare in some areas; 323	Stage et al.	1952
nigripes (Zetterstedt)	Carex marshes; ---; 5	Knight	1951
	---; low tundra in cold, high wind, active May-Aug.; 5	Weber	1950
	---; abundant; 5°	Hopla	1965
	At 1000 feet elevation in unshaded waters, rock pools with vegetation, alpine snow melt pools and tundra bog pools, bottoms and sides with organic debris, dead sedge or grass and sphagnum and other mosses; rocky tundra and alpine meadows, in forest, bite all day, at temperatures of 48°-65° F., in sunshine and in high winds, June and July, abundant; 62°	Jenkins & Knight	1950
	Shallow, grassy snow pools among marshes and dwarf willow and birch; invade camp buildings, peak Aug.; 62	Twinn et al.	1948
	Reservoirs with melting snow; ---; 126	Monchadskii	1936 +
	---; June-Aug.; 126°	Natvig	1948
nigromaculis (Ludlow)	---; ---; 5	Stone	1965
	Shallow pasture depressions and weedy irrigation ditches; possible vector western equine encephalomyelitis, July-Sept.; 62°	Rempel	1953
	Irrigated areas; ---; 62	Shemanchuk	1959
	---, ---; 62 (Alkaline waters in rain-filled depressions, bites during daylight hours, but more active in the evening)	Carpenter et al.	1946
	---; ---; 62 (Early ground pools)	Dyar	1921
	---; ---: 62 (Rain pools)	Dyar	1928
	Temporary overflow from irrigation ditch, muddy roadside pool, pool near habitation, edge of slough, alfalfa field; at light near habitation, bites day and night; 323°	Parker	1916

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES nigromaculis (Ludlow) (cont.)	Open irrigated or flooded meadows in prairie or open country; experimental vector of equine encephalomyelitis, St. Louis and Japanese B encephalitis, abundant; 323	Stage et al.	1952
	Temporary pools of fresh water; attracted to light traps, common, Apr.-Oct.; 323	Rozeboom	1942
	Temporary rain pools, pasture pot holes and flooded areas, intermittent stream bed pools and marshes; ---; 323	Rowe	1942
	Open sunlit pools of waste and intermittent water: ---; 323	Freeborn & Bohart	1951
	Puddles, prefers alkaline waters; ---; 323	Matheson	1944
	Foul, stagnant barnyard pool; ---; 323	Owen	1937
	Saline pool ; ---; 323	Ross	1947
	---; abundant in irrigated farming regions; 323°	Harmston	1949
diphadops Dyar & Knab	Depressions filled with water in the spring, surface pools filled by melting snow, small shallow scattered pools; vicious biter. readily bites man, feed any time during the day but are more active towards evening; 323°	Rees	1943
	Edge of drainage ditch in open country, shallow alkaline pools in valley; March, abundant in some areas: 323°	Stage et al.	1952
	Along foothills; April-June; 323	Rees	1934
nivitarsis Coquillett	Rocky, mountain pool; May; 323	Headlee	1945
pacifiensis Hearle	---; April; 62	Hearle	1927
pagetonotum Dyar & Knab	---; May; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
pallidohirtus Grossbeck	Woodland pool in mountain; May; 323	Headlee	1945
palustris Dyar	---; June; 62. ---; May-July; 323 (Early marsh pools, in forest until late summer)	Dyar	1922
pearyi Dyar & Shannon	---; ---; 62	Dyar	1928

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES pionips Dyar	Temporary or semi-permanent pools in sphagnum-heath bogs, roadside ditches, tractor tracks, small shallow bodies of water in recently disturbed ground; ---; 5	Gjullin et al.	1961
	---; abundant; 5°	Hopla	1965
	---; June; 5. ---; May, July, Aug.; 62	Dyar	1920
	---; ---; 5, 323 (Early spring pools in spruce forest, active after sunset)	Dyar	1922
	Cool and clear water in small depressions at the bases of spruce trees; tree branches, rarely bites; 62°	Rempel	1953
	Shaded rockpools with sedge, grass, moss and organic debris, at edge of conifer forest; June; 62	Jenkins & Knight	1950
	---; deep wooded valley with a large stream and unusually dense balsam fir and black spruce; 62	Brown	1951
	---; forest; 62	Twinn	1949
	---; ---; 62, 323 (Large spring pools)	Dyar	1928
	Permanent pools in dense timber; forested mountains; 323	Mail	1934
	Small pools in meadow at 7000 feet elevation; rare; 323	Stage et al.	1952
	Shaded shallow pool; June; 323	Dyar	1929
pontoriensis Ludlow	Salire pools; Mar., June-Aug., Dec.; 323	Dyar	1922
pretans Grossbeck	Meadow; April-May, July, Sept.; 323	Headlee	1945
prodotes Dyar	---; July; 5	Dyar	1920
	---; ---; 5. ---; June, Aug.; 62 (Early spring pools, bite both by day and night, males swarm high over spaces between bushes or small trees in open country)	Dyar	1921
prolixus Dyar	Early spring pools; June, July; 5	Dyar	1922
pseudidantaeus Smith	---; ---; 5, 62. Sphagnum bog swamp; ---; 323	Smith	1952

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES pullatus (Coquillett)	Small clear snow melt pools in *Carex* meadows; ---; 5°	Gjullin et al.	1961
	---; ---; 5, 323. ---; ---; 62 (Muddy pools along streams and lakes, males swarm after sunset in opening of the forest or over willows)	Dyar	1921
	From sea level to 1000 feet elevation, unshaded bare granite or gneiss rock pools, pools with sedge, sphagnum or other mosses and humus on sides and bottoms, clear water; ---; 62°	Jenkins & Knight	1950
	Temporary water, pools; May-July, swarm after sunset; 62	Dyar	1920
	---; ---; 62 (Artificial containers, small pools or marshy spots near dwellings)	Winn & Beaulieu	1915
	Ground depressions in the forest and meadows of higher mountain regions, pools filled with water from melting snow or from overflow of mountain streams; bite fiercely at any time during the day; 323°	Rees	1943
	Grassy pools near timber; abundant in mountainous areas and heavily wooded areas, May-Aug.; 323	Harmston	1949
	Shallow waters containing vegetation debris; rare; 323	Irwin	1943
	At 7,200-10,000 feet elevation in open and shaded meadow pools adjacent to streams; ---; 323	Chapman	1966
	Small pools found in tracks in marshy ground; ---; 323	Parker	1916
	Forest and meadows at 7000 feet elevation; ---; 323	Matheson	1944
	---; bite all day in shade, common in some areas; 323	Stage et al.	1952
punctodes Dyar	Early snow pools; June-Aug.; 5	Dyar	1922
	Brackish coastal marshes; ---; 5°	Frohne	1956
	Carex marshes; ---; 5	Knight	1951
	---; ---; 62, 323 (Pools filled with snow water)	Dyar	1928

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES punctor (Kirby)	Shallow semi-permanent pools in *Sphagnum*-heath bogs and *Carex* or *Calamagrostis* marshes; ---; 5	Gjullin et al.	1961
	Area covered with brushy shrub, moss and grass area; ---; 5	Gjullin & Cross	1951
	Temporary snow pools; ---; 5	Tulloch	1934
	---; May-Aug.; 5	Weber	1950
	---; abundant; 5°	Hopla	1965
	---; ---; 5, 323 (Common in forested areas). Forest; in houses, fierce biter, attack in the evening and by night, in shade by day; 62°	Rempel	1953
	In black and white spruce forests, bog and rock pool with vegetation, sphagnum bog pools, sedge marsh pool with iron flocculate with an oil slick, grass pool with decaying wood and vegetation, shaded and unshaded with stained or turbid water; rare; 62	Jenkins & Knight	1950
	Snow pools at 3000 feet altitude, shallow woodland pools; in deep woods, bite all day, fairly common; 62	Hearle	1926
	Pools and marshy areas with vegetation, on treeless tundra meadow, in swampy woods; active after sunset; 62	Twinn et al.	1948
	---; deep wooded valley with a large stream and unusually dense balsam fir and black spruce; 62	Brown	1951
	---; persistent biters, most common and annoying; 62° (Woodland and forest species, any body of standing water, large or small and roadside ditches, marshes, early species and can withstand repeated freezing and thawing)	Steward & McWade	1961
	---; May-Sept.; 62	Dyar	1920
	Pools in the timber and mountain meadows, especially pools with mossy bottoms usually filled with water from melting snow and the more permanent pools are slightly acidic; timbered regions, persistent biters, 323°	Rees	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES punctor (Kirby) (cont.)	Shaded swamp pools; in wooded regions day and night, in and around buildings during early morning and evening, April-Aug.; 323	Irwin	1943
	In early spring usually in pools containing decaying organic matter; bite during the day or at dusk; 323	Rees	1934
	Cold, shaded pools of the coniferous forest, woodland pools in deciduous forest, open bogs; ---; 323	Owen	1937
	Early pools, especially mossy woodland pools and bog pools; ---; 323	Lowry	1929
	Mountain areas up to 13,000 feet elevation; ---; 323	Matheson	1944
	Early spring snow-water pools; ---; 323	Dickinson	1944
	Wooded swamps; ---; 323	Stearns et al.	1933
purpureipes Aitken	---; ---; 323	Stone	1965
quaylei Dyar & Knab	---; ---; 62°. Tidewater pools; ---; 323°	Dyar	1907
rempeli Vockeroth	---; ---; 62	Stone	1965
riparius Dyar & Knab	---; ---; 5	Stone	1965
	Small weedy ditches and depressions in the neighborhood of clumps of aspen poplar, in transition zone between forest and prairie; May; 62	Rempel	1953
	Irrigated areas; ---; 62	Shemanchuk	1959
	Ditches; ---; 62	McLintock	1944
	---; prairie; 62	Twinn	1949
	---; June; 62	Dyar	1921
	---; ---; 62. ---; ---; 323 (Prairies in grassland pools, ditches and depressions near poplar and willow clumps)	Steward & McWade	1961

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *riparius* Dyar & Knab (cont.)	---; ---; 62 (Spring pools on the prairie)	Matheson	1944
	Temporary spring pool, pasture, pot holes, spring run-off water in an intermittent marsh; April; 323	Rowe	1942
	Early spring snow-water pools in open; May-July, Sept.-Nov.; 323	Dickinson	1944
	Spring pools in the prairie region; ---; 323	Owen	1937
	---; rare; 323	Irwin	1943
sapphirinus Osten-Sacken	---; ---; 62 (Rare)	Dyar	1921
sayi Dyar & Knab	Shaded woodland pools, meadows and lakes; ferocious biters, July-Sept.; 323°	Headlee	1945
scapularis (Rondani)	Rainwater pools; susceptible to experimental infection with yellow fever virus, rare; 323	King et al.	1950
	---; ---; 323°	McGregor & Eads	1943
schizopinax Dyar	Snow-water, in foothills, open meadow pools, marshy lake margins at 5000-8,700 feet; Feb., April-June; 323°	Chapman	1966
	Small depressions, around edge of permanent pools in open meadow, foul water with high alkalinity; ---; 323	Mail	1934
	Overflow from a permanent pool, cattle tracks, scummy seepage, water in the open; ---; 323	Dyar	1929
serratus (Theobald)	Low swampy woodland and mountain pools, meadows, mountains; June-Sept.; 323	Headlee	1945
sierrensis (Ludlow)	---; ---; 62, 323	Stone	1965
	Tree holes in quaking aspen and black cottonwood at 6,700-7,500 feet; bite at 6,700 feet, April-Sept. and Nov.; 323°	Chapman	1966
signifera (Coquillett)	Tree holes, occasionally barrels or tubs; Aug., Nov.; 323	Headlee	1945
smithii Coquillett	Pitcher plants in cold bog, orchids; May; 323	Felt	1904

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES solicitans (Walker)	Salt marsh; ---; 62	Twinn	1949
	Pools in salt marsh along coast, pools filled by extra high tides or heavy rains, salt water pools; thick pine woods, open beaches at dusk, severe biters both day and night, enter houses freely; 323°	Lowry	1929
	Pot holes and depressions; bite fiercely in grass and shrubbery by day, may fly 40-50 miles, experimental vector of eastern and western equine encephalitis; 323	King et al.	1960
	Salt marshes along ocean coasts, salt water pumped from oil well, brackish swamp; bite in full sunlight, more prevalent in spring and autumn; 323	King et al.	1939
	Salt or brackish pools on tidal marshes; bite especially late afternoon; 323	Komp	1923
	Salt water from mine or oil well drainage, waters with a salinity three times the average of ocean water; ---; 323	Ross	1947
	Brackish swamps, oil fields; ---; 323	Matheson	1944
	Surface water, pot hole, ditch, marsh; ---, 323	Bick	1946
	Salt and brackish mud water; ---; 323	Beyer	1923
	Soil of salt marsh after heavy rain; ---; 323	Stearns et al.	1933
	Saline pools; ---; 323	Fellton et al.	1950
	Relatively fresh-water pool; ---; 323	Carpenter & Middlekauff	1944
	Salt wells; ---; 323°	Wilson et al.	1946
	---; coastal and bay areas; 323	Dorer et al.	1944
	---; light traps; 323	Edman & Downe	1964
	---; all year; 323	Carpenter & Chamberlain	1946

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES spencerii (Theobald)	Shallow grassy depressions and overgrown roadside ditches; common in April, Sept.; 62	Rempel	1953
	Irrigated areas; bite all day; 62°	Shemanchuk	1959
	Temporary snow and rain pools; prairie; 62	Twinn	1949
	Shallow, weedy ditches and grassy sloughs; ---, 62. Plains and mountains; ---; 323	Matheson	1944
	Open pools; ---; 62	McLintock	1944
	Water on edge of alfalfa field, temporary pool caused by rains, irrigation water in clover field; bites both day and night, July; 323°	Parker	1916
	Early in the spring in surface pools filled by melting snow or spring rains, frequently alkaline; plains, prairie regions, foothills, April; 323	Rees	1943
	Roadside ditches, hollows by river banks; May-Aug.; 323	Mail	1934
	Shallow waters containing vegetation debris; rare; 323	Irwin	1943
	Marshes; in light trap; 323	Ross	1947
	Shallow canyon with grassy spots surrounded by willows; ---; 323	Dyar	1929
	---; July-Sept.; 323	Dickinson	1944
spencerii idahoensis (Theobald)	---; ---; 62, 323	Stone	1965
	Foothills, open roadside ditches and meadow pools near river; May-Aug.; 323°	Chapman	1966
spencerii spencerii (Theobald)	---; ---; 62, 323	Stone	1965
squamiger (Coquillett)	Pools and narrow channels filled by the higher monthly tides; common in bushes in ravines near shore; 323	Dyar	1922
	Brackish water; bites during day and before dusk; 323°	Matheson	1944
	Salt water, along wooded stream beds; ---; 323	Freeborn & Bohart	1951
	Salt marsh drainage ditches; ---; 323	Herms	1934

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *sticticus* (Meigen)	Common in flooded wooded valleys; May-June; 62°	Rempel	1953
	Floodwater in wooded river valley bottoms; ---; 62	Twinn	1949
	Irrigated areas; ---; 62	Shemanchuk	1959
	---; ---; 62, 323 (Woods and open country, flood pools along streams and rivers, persistent biters in day and evening, May-Sept.)	Steward & McWade	1961
	Open or woodland pools on the flood plains of streams where vernal flooding occurs, low mountain valleys along margins of larger streams; vicious biter, in woods or in the open during the day, more active in the evening; 323°	Rees	1943
	Brushy bottom lands along river, spring floods; capable of transmitting western equine and St. Louis encephalitis virus; 323	Stage et al.	1952
	Early spring pools; under bush; 323	Rozeboom	1942
	Floodwaters, temporary grassy pools in field and thickets, rain pools; rare; 323	King et al.	1960
	Along flood plains of larger rivers in flood pools, shaded pools; common; 323	Ross	1947
	Temporary spring pools in thick woods; ---; 323	Rowe	1942
	Shaded permanent swamp pool; ---; 323	Irwin	1943
	---; all year; 323	Quinby	1941
stimulans (Walker)	Temporary snow pools; June-Aug.; 5	Tulloch	1934
	Semi-permanent pools overgrown with *Equisetum fluviatile* or *Potentilla palustris*; ---; 5	Gjullin et al.	1961
	---; ---; 5. ---; persistent and most annoying biter near towns and villages; 62° (Snow water and rain pools of every kind, April-June)	Steward & McWade	1961
	---; ---; 5, 62, 323 (Rain-filled woodland pools along rivers, vicious biters and often annoying in woodlands)	Carpenter et al.	1946
	---; ---; 5°	Hopla	1965
	Temporary waters in and near city; persistent biter by day and at dusk, April-July; 62	Twinn	1926
	Pools overflowed by early high water, along streams, early marsh pools; ---; 62	Dyar	1920

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES stimulans (Walker) (cont.)	---; deep wooded area with a small stream; 62	Brown	1951
	---; in woods; 62°	Downe et al.	1963
	---; Aug.; 62	Winn & Beaulieu	1932
	---; ---; 62, 323 (Woodland and river flood pools, swamps, marshes, rarely enter houses, invades the urban communities, villages and parks, vicious biter and occurs in enormous number rendering life almost unendurable, April-Sept.)	Matheson	1944
	Pools formed by the overflow of streams, surface pools filled from snow water and early spring rains; wooded regions of the mountains at lower elevations, readily bites man any time during the day; 323°	Rees	1943
	Shaded woodland pools, temporary rain pools exposed to sunlight, forest pools, semi-permanent pools; bites readily in the woods at all hours; 323	Owen	1937
	Beach and mat pools; in wooded areas day and night, in and above houses early morning and evening, abundant; 323	Irwin	1943
	Swamp waters; Sept.; 323	Dickinson	1944
	Temporary waters of spring pools and pond overflows, intermittent stream bed pool; ---; 323	Rowe	1942
	Flood pools of river bottoms, rain filled pools in the woods; ---; 323	Mail	1934
	Open ground pools; ---; 323	Lowry	1929
	Stump holes; ---; 323	Ross	1947
	---; pest in some areas, rare; 323	King et al.	1960
	---; March-Aug.; 323	Tellton et al.	1950
subcantans Felt	---; June; 62 (Artificial containers, small pools or marshy spots near dwellings, bites man)	Winn & Beaulieu	1915
	Fresh water; ---; 323	Headlee	1945
sylvestris (Theobald)	River flooded open flats and meadows; ---; 62°	Hearle	1921a
	---; June, July; 62 (Artificial containers, small pools or marshy spots near dwellings)	Winn & Beaulieu	1915

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *sylvestris* (Theobald) (cont.)	Temporary pool near habitation, pool formed by overflow of irrigation water, small permanent pools, waste irrigation water, pool in edge of alfalfa field, temporary rain pools and roadside pool; bites day and night, May-Aug.; 323°	Parker	1916
	Clear woodland pools, open swamp areas; ---; 323	Headlee	1945
sylvicola Grossbeck	Pools in dense woodlands; May, July; 323	Headlee	1945
taeniorhynchus (Wiedemann)	Salt marshes; ---; 62	Hearle	1926
	Coastal marshes with mangrove and pickleweed, pot holes and temporary pools in *Batis* and *Distichlis*, fresh water pools; very annoying and fierce biter in shade in mangrove and other forests, in shrubbery about dwellings, in light traps, experimental vector of several strains of encephalitis; 323°	King et al.	1960
	Salt or brackish pools on tidal marshes; bites by day especially late afternoon; 323	Komp	1923
	Salt marshes flooded by rains or tides; common; 323°	King et al.	1939
	Saline pools in oil fields, occasionally in fresh water; ---; 323	Matheson	1[illegible]
	Fresh water pool thirty miles from coastal marshes; ---; 323	Carpenter & Middlekauff	1944
	Surface water, ditch; ---; 323	Bick	1946
	---; abundant and annoying pest, near seashore; 323	Beyer	1923
	---; all year; 323	Carpenter & Chamberlain	1946
tahoensis Dyar	Large open pools; May-June; 323	Dyar	1922
thelcter Dyar	Temporary rain pools in limestone strata depressions, densely shaded pool with much *Sesuvium*; in light traps, Oct. and Nov., rare; 323°	King et al.	1960
	Temporary pools, overflow irrigation water; spring and autumn; 323	Matheson	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *thibaulti* Dyar & Knab	Holes at the bases of trees and stumps; hollow stumps and trees near breeding places, March-July; 323°	Shields	1938
	Tree and stump holes in swamps; bite fiercely in woodlands at midday, common; 323°	Matheson	1944
	Tree holes preferably of sweet gum and tupelo gum trees; ---; 323	Ross	1947
	---; rest in hollow trees and stumps, rarely about dwellings, daytime biter, rare; 323	King et al.	1960
	---; Dec.-May; 323	Carpenter et al.	1946
tormentor Dyar & Knab	Transient woodland pools; bite late afternoon to dusk in forested areas; 323°	Breeland et al.	1961
	Temporary rain-filled pools during summer months; ---; 323	Carpenter et al.	1946
	---; light traps, Sept.-Oct.; 323	Dow et al.	1964
	---; Mar.-Aug.; 323	Wirth	1947
	---; rare; 323	King et al.	1939
tortilis (Theobald)	Temporary rain pool; ---; 323	Thurman et al.	1951
	---; in light trap, Aug., rare; 323	King et al.	1960
trichurus (Dyar)	Small weedy sloughs; ---; 62	Rempel	1953
	---; deep wooded valley with a small stream; 62	Brown	1951
	---; wooded area; 62	Twinn	1949
	---; April-July; 62. ---; ---; 323 (Woodland pools and swamps)	Steward & McWade	1961
	---; in woods; 62°	Downe et al.	1963
	---; ---; 62, 323 (Spring pools, wooded and marshy areas, bites freely in wooded regions)	Matheson	1944
	---; ---; 62, 323 (Early spring pools, edges of grassy marshes)	Dyar	1928
	---; ---; 62 (Ground pools, ditches)	Dyar	1921
	Pools at edges of grassy swamps, ditches along roads, wood pools; common; 323	Lowry	1929
	More acidic pools of bog mat; wooded regions, enter houses; 323	Irwin	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *trichurus* (Dyar) (cont.)	Melting snow pools at high altitudes: rare in some areas; 323	Stage et al.	1952
	Marshes; bite day and night; 323°	Dyar	1929
	Partially shaded pools in swamp, open bog; ---; 323	Owen	1937
	Early spring snow-water pools; ---; 323	Dickinson	1944
	Ground pools; ---; 323	Dyar	1922
	---; March-Aug.; 323	Blickle	1952
triseriatus (Say)	Tree holes, artificial containers; June and Sept., rare; 62	Twinn	1926a
	Pitcher plants; ---; 62	Rempel	1950
	---; ---; 62, 323 (Common in woodlands and around homes, bites man both day and early evening)	Carpenter et al.	1946
	---; ---; 62, 323 (Attracted to lights, July)	Steward & McWade	1961
	Tree holes in woodlands and in *Bursera simarubra*, pitcher plants, artificial containers; in light traps, fierce daytime biter in or near woods and about houses, potential and capable vector of yellow fever, western and eastern equine encephalitis, abundant; 323°	King et al.	1960
	Swamps; enter houses, experimental transmission of equine encephalomyelitis; 323	Knutson	1943
	Fresh water, semi-permanent water, roadside pool; ---; 323	Darsie et al.	1951
	Pot holes; ---; 323	Olson & Keegan	1944
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1957
	---; all year; 323	Carpenter & Chamberlain	1946
	---; common; 323	King et al.	1939
	---; rare; 323	Beyer	1923
	---; ---; 351 (Tree holes, pitcher plants and artificial containers, bite is painful)	Rempel	1953

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES trivittatus (Coquillett)	---; ---; 62, 323 (Woodland pools and swamps, semi-open or lightly wooded areas, rarely in forests, persistent biters day and night)	Steward & McWade	1961
	Temporary flooded areas, rain pools and stream bed pools, intermittent marshes, margins of permanent ponds; important pest during summer and fall; 323	Rowe	[illegible]
	Temporary pools, shady woodland pools resulting from spring rains and floods; May-Oct.; 323	Ross	1947
	Temporary pools in open and shallow ditches covered with vegetation; rare; 323	King et al.	1960
	Flood pools of rivers, rain-filled ground pools; ---; 323	Lowry	1929
	Flood pools of river, forest pools; ---; 323	Dyar	1928
	In woods, temporary creek; ---; 323	Lickirson	1944
	Swampy area; ---; 323	Knutson	1943
	Exposed pools; ---; 323	Headlee	1945
	Tree holes; ---; 323	Stearns et al.	1932
	---; early spring, readily bites during the day when their resting places in wooded areas are invaded, persistent bite is the most painful, light traps; 323*	Gate & Gates	1944
	---; bites both in shade and open; 323	Owen	1937
	---; ---; 323 (Associated with floodwater)	Matheson	1944
varipalpus (Coquillett)	Rain-filled tree holes, artificial containers; May-Aug., fairly common; 62*	Hearle	1926
	---; forests; 62	Dyar	1920
	---; ---; 62, 323 (Bite day and night)	Dyar	1928
	---; ---; 62 (Enter houses)	Matheson	1944
	Tree holes, rock holes and wooden receptacles under trees, may be found in mid-winter; experimental vector of western equine encephalomyelitis, vicious biter, abundant; 323*	Stage et al.	1952
	Rain barrels containing decaying leaves; occasionally enters houses; 323	Freeborn & Bohart	1951

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES ventrovittis Dyar	Pools in mountain meadows at high elevations; rare; 323	Stage et al.	1952
	Pools with frozen edges and surrounded by snow banks; ---; 323	Freeborn & Bohart	1951
	Early spring pools; ---; 323	Matheson	1944
	---; bites by day in mountain meadows and woods, June-Aug.; 323°	Dyar	1922
vexans (Meigen)	Flood pools in meadows and open places, temporary swamps, roadside ditches, flooded sumac prairies, cottonwood swamps; attracted to lights, very abundant; 62	Hearle	1926
	Shallow pasture depressions of the open prairie, semi-permanent marshy areas; possible vector of western equine encephalomyelitis; 62	Rempel	1953
	Irrigated areas, temporary pools with alkaline water; rest in shelter belts and tall vegetation, May-Sept.; 62	Shemanchuk	1959
	Woods, open pools, ruts; grass, houses; 62	McLintock	1944
	Flooded meadows and open places; ---; 62	Twinn	1949
	---; common, 62. Foul roadside pools, hog wallows, river banks, low-lying depressions; serious pest in towns and cities; 323 (Rain pools in meadows and open marshes, foul roadside puddles, abundant in filthy pools around city dumps, hog wallows, occasionally in clear woodland pools, permanent swamp pools)	Matheson	1944
	---; persistent biter; 62°. ---; ---; 323 (Any small body of standing water, in woods or in the open, enter houses in the evening, attracted to light, troublesome biters)	Steward & McWade	1961
	---; ---; 62, 323 (Rain-filled depressions and flood water, experimental transmission of eastern, western equine encephalitis and St. Louis encephalitis, bites in shady places by day and after dark)	Carpenter et al.	1946
	Contaminated and fresh water, rain pools, flood water seepage and surplus water from irrigation, temporary pools in open pasture; feed in the shade during the day, especially annoying at dusk and early evening, can transmit both St. Louis encephalitis and western equine encephalomyelitis; 323	Tate & Gates	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES vexans (Meigen) (cont.)	Irrigated and flood water areas at sea level and mountain meadows, overflow areas and bottom lands of rivers; enter houses at dark, most important pest, naturally infected with western equine encephalomyelitis and experimentally infected with St. Louis encephalitis virus, very abundant; 323°	Stage et al.	1952
	Surface pools, streams in the mountains and plain regions along the margins of streams in the lower river valleys, in all parts where irrigation is practiced; in wooded regions during the day, attracted to light; 323	Rees	1943
	Temporary rain pools with some decaying vegetation, semi-permanent and permanent ponds, marshes, woodland pools, cold forest pools, foul and stagnant puddles, natural standing water; abundant in May; 323	Owen	1937
	Flood plains of rivers and streams; in light traps, experimental vector of eastern equine and St. Louis encephalitis; 323	King et al.	1960
	Woodland and open swamp pools and temporary pools in pasture land; seldom enters houses, may be very troublesome; 323	Komp	1923
	Overflow pools along wooded streams, in flooded borrow pits; foothills, plains, irrigated farming regions; 323	Harmston	1949
	Permanent cranberry bogs, swamps and upland pools; experimental transmission of equine encephalomyelitis; 323	Knutson	1943
	Temporary pond situations, many types of rain-pools flooded edges of marshes; common; 323	Ross	1947
	Flood water of woodland water course, open sunny marshes rain-filled road ruts; ---; 323	Freeborn & Bohart	1951
	Temporary ground pools, semi-permanent pools, flood or seepage, open, sunlit pools, roadside ditches, flooded meadows; ---; 323	Mail	1934
	Common in fresh-water, polluted and unpolluted water, margin of salt marsh; ---; 323	Darsie et al.	1951
	Permanent swamp pools, deep shaded pool on mat; ---; 323	Irwin	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AEDES *sexans* (Meigen) (cont.)	Surface water, pot hole, ditch, marsh; ---; 323	Bick	1946
	Polluted cat-tail swamps, clean woodland pools; ---; 323	Stearns et al.	1933
	Ditch of flower bed in garden; ---; 323	Beyer	1923
	Foul, stagnant pools contaminated with sewage; ---: 323	Olson & Keegan	1944
	Septic tanks, ruts, furnace pits; ---; 323	Shields	1938
	Woodland pool; ---; 323	Breland	1947
	---; possible vector of encephalitis; 323	Edman	1964
	---; Jan.-Nov.; 323	Wirth	1947
	---; lake area; 323	Quinby	1941
	---; light traps; 327	Twinn	1944
zoosophus Dyar & Knab	---; ---; 323	Stone	1965
ANOPHELES *albimanus* Wiedemann	Any collection of sunlit fresh or brackish water, pure or stagnant, lakes and canals covered with vegetation; invade houses at night and leave before sunrise, naturally and experimentally infected with *Plasmodium vivax* and *P. falciparum*; 323	Carpenter et al.	1946
	In seepage water, hoofprints, wheel ruts, ground pools with algae and artificial containers with floating plants; ---; 323	Matheson	1944
	---; enter buildings at night to bite, in forested areas by day, Sept.-Jan., rare; 323*°	King et al.	1960
	---; possible transmitter of malaria; 323°	McGregor & Eads	1943
	---; light traps, May: 323	Carpenter	1949
argyritarsis Robineau-Desvoidy	---; ---; 323	Root	1922
atropos Dyar & Knab	Permanent salt pools, shallow water and alluvial marshes; enter houses, bites man in bright sunlight and by night, experimentally infected with *Plasmodium vivax*; 323°	Matheson	19--

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES atropos Dyar & Knab (cont.)	Salt water of coastal marshes; in light traps, experimentally infected with malaria, rare; 323	King et al.	1960
	Soft mud, salt water; coast, suspected vector of malaria; 323	Beyer	1923
	Grass-grown margins of pools on the edge of salt marshes; ---; 323	Bishop	1933
	Shallow, tidal waters of mangrove swamps; ---, 323	Schord et al.	1947
	Abandoned brackish cistern; ---; 323	Fisk	1939
	---; Feb.-Dec.; 323	Carpenter & Chamberlain	1946
aztecus Hoffmann	---; ---; 323	Baker & Kitzmiller	1963
barberi Coquillett	Wooden tubs; rest in tree holes, nearby houses and other shelters, attracted to light, proved susceptible to infection with malaria, all year, rare; 323	King et al.	1960
	Rot cavities in trees, stump holes, artificial containers near wooded area, sometimes hibernates frozen in ice; ---; 323	Gerhardt	1966
	Tree holes, highly polluted sumps in manure pits, artificial containers contaminated with leaves, humus and other organic materials, hibernates frozen in ice of tree holes; ---; 323	Boyd	1949
	---; experimentally infected with *Plasmodium vivax*, 323	Carpenter et al.	1946
	---; readily bites man, transmit *Plasmodium vivax*; 323	Matheson	1944
	---; enter houses, persistent, but rare, 323	King et al.	1959
boydi Vargas	---; ---; 323	Vargas	1939
crucians King	Brackish water near coast and waters with less salt, roadside ditches with much *Chara* and other plants, salt-marsh pools with flotage, algae and grasses; rare; 323	King et al.	1960
	Saline waters with vegetation; experimentally infected with *Plasmodium falciparum*; 323	Matheson	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES bradleyi King (cont.)	Surface water, pothole, ditch, artificial container; diurnal; 323	Bick	1946
	---; April-Dec.; 323	Carpenter & Chamberlain	1946
crucians Wiedemann	Acid-water, dense cypress swamps and coastal plains, ponds, impoundments, blocked streams and meadow swales, wheel ruts, temporary pools in pine barren and other nonvegetated accumulation of water; probable malaria vector, principal carrier of malaria in some areas; 323	Boyd	1949
	Acid or alkaline waters of ponds, lakes, pools, permanent or temporary swamps with vegetation or debris, wheel ruts, temporary pools in pine barrens; in light traps, susceptible to infection with malaria, infected with eastern equine encephalitis, common; 323	King et al.	1960
	Ponds, lake margins, swamps, and pools, acid water in cypress swamps; experimentally infected with *Plasmodium vivax* and *P. falciparum*, naturally infected with malaria, bites man in sunlight and in shade; 323*	Matheson	1944
	Slightly brackish water with very dense vegetation, fresh water; bites man indoors, considered to be an important carrier of malaria; 323*	Stearns et al.	1933
	Salt marsh; domestic: 323	Headlee	1945
	Ground pools near the coast; dangerous malaria carrier; 323	Dyar	1922
	Grassy brackish swamp fed by springs which contain iron, sulphur, [illegible] various alkalis, in shade or partly exposed to the sun, in irrigation ditches and large canals with vegetation and a constant level of water; ---; 323	Barber	1939
	Large lily ponds with dirt banks, old borrow pits bordered by vegetation, unshaded ponds containing or bordered by vegetation; ---; 323	Good	1945
	Amongst vegetation and floatage in impoundments, in grassy, semi-permanent rain pools, abundant in artificial reservoirs; ---; 323	Roseboom	1942
	Permanent pools with water hyacinth *Eichornia crassipes*; ---; 323	Hirman	1935

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES crucians Wiedemann (cont.)	Cattail marshes; ---; 323	Ross	1947
	Salt water; ---; 323	Beyer	1923
	---; experimentally infected with St. Louis encephalitis; 323	Chamberlain et al.	1964 a
	---; bites outdoors at night, in woods by day; 323	King et al.	1939
	---; seldom transmits malaria in nature; 323	Komp	1923
	---; abundant in the coastal area; 323	Daisie et al.	1951
	---; possibly transmits malaria; 323	McGregor & Eads	19 3
	---; well shaded driftwood; 323	Shields	1938
	---; all year; 323	Wirth	1947
crucians bradleyi King	In pools of brackish water, near the coast, in fresh water; experimentally infected with *Plasmodium falciparum*; 323	Carpenter et al.	1946
	---; Jan. - Sept.; 323	Carpenter & Chamberlain	1946
crucians crucians Wiedemann	Swamps, ponds and lakes, also in acid waters in cypress swamps; enters houses, experimentally infected with *Plasmodium vivax* and *P. falciparum*, attracted to light traps, bites by night outdoors; 323[c]	Carpenter et al.	1946
	---; all year; 323	Carpenter & Chamberlain	1946
crucians georgianus King	Acid side-hill seepage puddles characteristic of cut over long leaf pine inland; ---; 323	Wirth	1947
	Seepage pools in small streams and at the bases of hills; ---; 323	Carpenter et al.	1946
	---; Jan., April-Sept., Nov.; 323	Carpenter & Chamberlain	1946
crucians Dyar & Knab	---; ---. 323	Root	1922
earlei Vargas	Pools and pools along lake shores that are permanent or dry for only a short time during late summer; active May and June; 5	Gjullin et al.	1961

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES *earlei* Vargas (cont.)	---; ---; 5, 323. ---; flying in houses in Dec., June-Oct.; 62 (Woodland pools, open bogs, margins of permanent and semi-permanent pools and roadside puddles, females hibernate in buildings and houses, sometimes found as early as March)	Steward & McWade	1961
	Irrigated areas, roadside ditches, field ponds overgrown with vegetation, shaded portions of pools with rich organic matter and algae. sluggish streams with marginal vegetation growth; ---: 62	Shemanchuk	1959
	---; enter houses during winter and early spring, May; 62°	Rempel	1953
	Cold clear water in shallow margins of semi-permanent and permanent ponds overgrown with emergent vegetation, woodland pools, marshes. open bogs. margins of sluggish streams; very aggressive: 323	Gerhardt	1966
	Margins of canal with thick floating and emergent vegetation in clear very cold water of 16°C, low marshy seepage area, small semi-permanent ponds; active at dusk in cold weather, July; 323	Rozeboom	1951
	---; invade houses, bite man in the bright sunlight, feed on man at all hours during the night; 323°	Pratt	1952
	---; Aug.-Sept.; 323	Fellton et al.	1950
eiseni Coquillett	---; ---; 323	Root	1922
fagandoi Lutz	---; ---; 323	Root	1922
franciscanus McCracken	Sunlit pools along the courses of receding streams, common in the mats of green algae; ---; 323	Matheson	1944
	---, July-Sept.; 323	Harmston	1945
freeborni Aitken	---; ---; 62. Permanent and semi-permanent water surfaces exposed to sunlight with some transient shade produced by floatage, emergent vegetation or algae, warm water, slightly alkaline clean water, brackish water, desert pools, seldom in polluted water, up to 7000 feet elevation; shelter in outbuildings, homes, cellars and similar locations, bites avidly at dusk and dawn also by day, carrier of malaria, can transmit malaria in the winter in heated rooms; 323°	Boyd	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES freeborni Aitken (cont.)	Clean sunny water, irrigated areas, river margins, creeks and irrigation ditches, ponds, sloughs and roadside ditches, hibernate in root cellars, barns, outbuildings and other sheltered locations, naturally infected with western equine encephalomyelitis, Feb., April; 323	Stage et al.	1952
	Shallow pools of clear water containing mats of green algae or floating *Lemna*; plains and prairie regions, low mountain valleys, abundant, most important vector of malaria, May-Oct.; 323*	Rees	1943
	Irrigated hay fields, rice fields, shaded fresh, clear, cool, seepage water; experimentally infected with *Plasmodium vivax* and naturally infected with malaria; 323	Matheson	1944
	---; possible vector of malaria; 323	Pratt	1952
georgianus King	Pond, shallow seepage water at head of small stream, small puddles with algae and grassy edges; rare; 323	King et al.	1960
	Shallow, small seepage depressions in boggy side hills or swales, outlets of seepage water, hoofprints, favored by pitcher plant, *Sarracenia purpurea*; ---; 323	Boyd	1949
	Fresh water; ---; 323	King et al.	1939
	---; all year; 323	Carpenter & Chamberlain	1946
grabhami Theobald	---; ---; 323	Root	1922
luzei Cruz	---; ---; 323	Root	1922
maculipennis Meigen	---; ---; 5, 62, 323 (Small, permanent sunny pools with algae, standing irrigation water, considered the principal vector of malaria)	Dyar	1928
	Cottonwood flood-swamps, shallow pools under willow growth and permanent swamps and pools; nocturnal, fairly rare; 62	Hearle	1928
	Edges of creeks and permanent sloughs; houses, barns; 62	McLintock	1944
	---; carrier of malaria; 62	Twinn	1926a
	---; March-Sept.; 62	Hearle	1927
	---; ---; 62 (Temporary water puddles)	Dyar	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES maculipennis Meigen (cont.)	Shallow sunlit pools of clear water with green algae mats, hoofprints, wayside pools, neglected irrigation and drainage ditches; seepage areas; overwinter in and about dwellings, up to 5,438 feet altitude, experimental vector of tertian, subtertian and quartan malaria, all year, peak Sept ; 323*°	Freeborn	1926
	Grassy swamps, open pastures fed by irrigation water, irrigation ditches with vegetation and in constant level of water, in cold mineral springs: enter houses, carrier of malaria, common in summer and early autumn; 323	Barber	1939
	Permanent pools; wooded area where shaded, algae-filled pools are numerous, arid plains; 323	Mail	1934
	Semi-permanent and permanent ponds along shore-line with aquatic plants and algae, temporary rain pools, woodland pools, marshes, open bogs, shoreline of streams; ---; 323	Owen	1937
	Ponded areas bordering streams in wooded and open country, containing some marginal and aquatic floating plants; ---; 323	Rowe	1942
	Natural pools, margins of mud, lake and bog, mat pools, permanent swamp and beach pools; ---; 323	Irwin	1943
maculipennis freeborni Aitken	---; ---; 62*, 323*	Geigy & Herbig	1955
	Small fresh-water pools, partly exposed to sun-light with algae, hoofprints in seepage areas, bays in moving stream margins, cut-off and semi-permanent pools; enters houses, vicious indoor biter; 323°	Freeborn & Brookman	1943
maculipennis occidentalis Dyar & Knab	---; rare; 5	Stage & Chamberlin	1945
	Fresh water among algae mats; ---; 323*	Freeborn & Brookman	1943
neivai Dyar & Knab	---; ---; 323	Root	1922
occidentalis Dyar & Knab	---; ---; 5, 62. Permanent and semi-permanent water surfaces exposed to sunlight with shade, produced by floatage, emergent vegetation or algae, warm water, slightly alkaline clean water, brackish water, seldom in polluted water; valleys; 323 (Efficient experimental vector of malaria)	Boyd	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MACPHELES occidentalis Dyar & Knab (cont.)	---; ---; 5, 62, 323 (Grassy margins of lakes, in slow streams with vegetation, fierce biters, attack usually during twilight hours, overwintering females attack in bright sunlight)	Matheson	1944
	Pond filled with refuse, weed, cattails, sedges, and algae; light trap; 62	Twinn	1944
	Shore of sluggish, overgrown stream; wooded areas; 62	Rempel	1950
	Roadside ditches, alder-swamps; common; 62	Hearle	1921 a
	---; ---; 62 (Puddles, prefers permanent waters)	Dyar	1921
	Rice fields; naturally infected with malaria, March and April; 323	Freeborn	1917
	Open grassy pools; rare; 323	Stage et al.	1952
	River bottom; along creek, in cabin; 323	Parker	1916
	Swamp waters; June-Nov.; 323	Dickinson	1944
	---; seldom bites man; 323[c]	Pratt	1952
occidentalis freeborni Aitken	---; ---; 323	Bates	1949
occidentalis occidentalis Dyar & Knab	---; ---; 62, 323	Bates	1949
parvas Chagas	---; ---; 323	Root	1922
perplexens Ludlow	Margins of streams from limestone springs; rare; 323	King et al.	1960
plumbeus Stephens	Concealed places, artificial containers, tree holes; ---; 126	Shtakelberg	1925 +
pseudopunctipennis Theobald	Grassy brackish swamps, large canals and irrigation ditches with vegetation and constant level of water, in cold, fresh and bitter mineral springs, exposed or partly shaded in the sun, in seepages, ponds, riverbeds and streams; possible vector of malaria, Sept.; 323	Barber	1939

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES pseudopunctipennis Theobald (cont.)	Clear sunlit pools with algae, vegetated margins of slow-flowing streams; enter houses, bite readily, experimentally infected with *Plasmodium vivax* and *P. falciparum*, rare; 323°	King et al.	1960
	Wayside sunlit pools, foul waters; seldom enters habitations, experimentally infected with subtertian malaria; 323	Freeborn	1926
	In sandy river bed with algae; ---; 323	Rozeboom	1942
	River valley; ---; 323	King et al.	1939
	Ricefields; ---; 323	Freeborn	1917
	---; Oct.; 323	Wirth	1947
pseudopunctipennis franciscanus McCracken	---; ---; 62*, 323*	Geigy & Herbig	1955
	Open springs and spring-fed pools and seep areas adjacent to foothills, at 5,495 feet elevation; Oct.-March and May-Aug.; 323°	Chapman	1966
	Shallow pool at the edge of receding stream with abundant growth of algae in fullest sunlight, artificial containers, brackish water; ---; 323	Freeborn & Bohart	1951
	---; rare; 323	Stage et al.	1952
pseudopunctipennis pseudopunctipennis Theobald	Clear sunlit water, rich in algae; enters houses and bites man, naturally and experimentally infected with *Plasmodium vivax* and *P. falciparum*; 323*°	Carpenter et al.	1946
punctimacula Dyar & Knab	---; ---; 323	Root	1922
punctipennis (Say)	Roadside ditches, surface pools, cottonwood flood swamps, permanent swamps, rain-filled pools, open depressions in meadows; hibernate in cellars, out-houses and caves, fairly rare. 62°	Hearle	1926

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES punctipennis (Say) (cont.)	Log pools in the backwaters of the river, among wild rice in river margins, in a sedge-grown lily pool, cattail marsh; ---; 62	Twinn	1944
	Ponds; ---; 62	McLintock	1944
	---; March-Aug.; 62	Hearle	1927
	---; ---; 62. ---; at 1200 feet elevation or over, grassy areas; 323 (Rain water barrels, roadside puddles, muddy road ruts, grassy bogs, swamps, hog wallows, spring pools, stream margins, lakes and open ponds)	Matheson	1944
	---, ---; 62. ---; ---; 323 (Large pools, small rain puddles, rain barrels and artificial containers, seldom in buildings in summer, hibernates in buildings and hollow trees, bite anytime mostly in early evening)	Steward & McWade	1961
	---; ---; 62, 323 (All sort water puddles, in permanent water, a dangerous malaria carrier, active after sunset)	Dyar	1922
	---; ---; 62 (Ground pools)	Dyar	1928
	Flowing stream margins, wells, deep lime sinks, containers, clay borrow pits, pools without vegetation; bite mostly at night and in dense shade or on cloudy days, in barns, outhouses and in houses, more common in late fall and early spring, rare; 323°	King et al.	1960
	Marshes, swamps, ponds and pond holes, mill ponds, lake margins, pigpens, horse and cow tracks in wet ground, overflow or rain water, running waters, creek and streams, drainage ditches; experimentally infected with malaria, highly susceptible to *Plasmodium vivax*; 323	Sabrosky	1946
	Running streams, backwaters of lakes, cattail marshes, densely wooded cypress swamps, open and almost barren pools, open sunlit waters and densely shaded situations; experimentally infected with malaria; 323	Ross	1947
	Along the margins of streams; seldom enters houses, bites after dusk and during daylight in dense woodlands, experimentally infected with *Plasmodium vivax*, *P. falciparum* and *P. malariae*; 323	Carpenter et al.	1946
	Swampy areas, ground pools of various kinds, transient rain puddles; domestic, common, bite at dusk, in houses during winter; 323	Lowry	1929

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MOTHELES punctipennis (Say) (cont.)	Pools and eddies in drying stream in sunlight with mats of green algae, shallow mountain streams; overwinter in caves, houses and other shelters; 323	Gerhardt	1966
	Pools in tangled wooded sections, cool, clear, shaded with limited exposure to sunlight; bite in open, experimental vector of tertian malaria; 323	Freeborn	1926
	Swift streams with fringe vegetation; under rock ledges, bridges, hollow trees; 323	Shields	1938
	Stream pool; suspected vector of malaria; 323	Rozeboom	1942
	Woods, open pools; peak May-Nov.; 323	Horsfall	1936
	Natural and mat pools, lakeward edges of mat; rare; 323	Irwin	1943
	Almost all types of watered areas including temporary rain pools, pasture potholes, artificial containers and shallow sheet flood water, grass-covered borders of small pasture streams, rocky or sandy pools in the beds of larger creeks; ---; 323	Rowe	1942
	Grassy swamps, large canals and irrigation ditches with overhanging vegetation and in constant level with water, in cooler water, either shaded or fed by cold springs; ---; 323	Barber	1939
	Any standing water except in artificial receptacles, permanent and temporary water, open pools, ditches, meadows, prefer shaded woodland pools; ---; 323	Beadle	1952
	Margins of flowing streams, small clay borrow pits or pools without vegetation, seepage out-crop; ---; 323	King et al.	1939
	Slow-moving, grass bordered streams, stagnant pools, roadside ditches and pond margins; ---: 323	Darsie et al.	1951
	Foul, stagnant pool contaminated with sewage, potholes; ---; 323	Olson & Keegan	1944
	Fresh water, salt marsh and swampy areas inland; ---; 323	Headlee	1945
	Woodland creek pools; ---; 323	Freeborn & Bohart	1951
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES punctipennis (Say) (cont.)	---; possibly transmits malaria; 323	McGregor & Eads	1943
	---; only enters empty houses; 323	Komp	1923
	---; light traps; 323	Edman & Downe	1964
	---; all year; 323	Fellton et al.	1950
	---; ---; 323*	Knutson	1943
quadrimaculatus Say	---; March-Sept.; 62	Hearle	1927
	---; ---; 62, 323 (Fresh water in sluggish streams, canals, ponds and lakes with surface growings or emergent vegetation or floating debris, naturally and experimentally infected with *Plasmodium vivax*, *P. falciparum* and *P. malariae*, bites man at night, enters houses, in dark corners, in buildings, underneath houses, in hollow trees and other shelters during daylight hours)	Carpenter et al.	1946
	---; ---; 62 (Lake margins, swamps, water collections of permanent nature where aquatic vegetation or surface debris is abundant, occurs more extensively in open sunlit waters, cool, clean water, bites man, most common vector of malaria)	Vargas	1950
	---; ---; 62, 323 (Large pools, canals, debris on lake surface, puddles and temporary pools, bite chiefly at dawn and dusk, rest in shade)	Steward & McWade	1961
	Ponds, midstreams along leaves of plants with current moving leaves, marshes, swamps, pond holes, mill ponds, lake margins, garden pools, pigpens, hoofprints, overflow or rain waters, river banks, creeks, drainage ditches, springs, standing and running water; naturally and experimentally infected with malaria; 323°	Sabrosky	1946
	Ricefields, ditches, pools, swamps that are more or less permanent with abundant vegetation or surface debris, prefer partly shaded water, cool and clean without debris; in light traps and houses, most common, all year, peak June-Sept.; 323	Horsfall	1942

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS, ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AN. FREEBORNI *maculipennis* Say (cont.)	Permanent fresh water, sluggish streams, canals, lakes with emergent vegetation; rest by day in dark corners, underneath houses, stables and other shelters, regarded as the most important vector of malaria in some regions; 323	Gerhardt	1966
	Small pools, backwaters, shallow basins of large lakes and marshes with emergent vegetation, *Cassia* [illegible], cattails, rushes and shrubs, shallow, warm and sluggish waters; crepuscular and nocturnal, most important carrier of malaria; 323	Ross	1947
	Permanent fresh-water pools, ponds and swamps with vegetation and floating debris; in woods; 323	King et al.	1960
	Miscellaneous water collection with vegetation and debris; most important vector of malaria; 323*	Matheson	1944
	Surface water, artificial container; diurnal; 323	Bick	1946
	Woods, open pools near houses; in grass; 323	Horsfall	1936
	Brackish water of salt marsh; domestic; 323	Headlee	1945
	Fresh water, stagnant bayous or pools and ponds in which filamentous algae develop, floating masses or mats; ---; 323	Beyer	1923
	Permanent ground pools containing algae, back-waters of rivers and sometimes in brackish water of salt marsh pools; ---; 323	Lowry	1929
	Semi-permanent ponds, temporary rain pools containing algae and other aquatic vegetation; ---; 323	Owen	1937
	Marshes with warm water, aquatic vegetation or floating debris; ---; 323	Barnes et al.	1950
	Lily ponds, old borrow pits, quiet, sunlit pools with floating vegetation; ---; 323	Good	1945
	Potholes, temporary pools, streams, springs; ---; 323	Olson & Keegan	1944
strigimacula Dyar & Knab	---; ---; 323	Root	1922
tarsimaculatus Goeldi	---; ---; 323	Root	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES *walkeri* Theobald	Swampy, cattail grown lake with muddy bottom, amongst marshes in the woodland; at light traps, bite man at [illegible]on; 62°. ---; light traps; 327	Twinn	1944
	---; abundant in *Typha* swamps; 62	Winn & Beaulieu	1932
	---; ---; 62, 3[illegible] (Grassy margined pools and lakes, swamps and shallow-flooded grassy areas with emergent vegetation, under houses, barns, piggeries, under overhanging grass and shrubbery enter houses at night, bites at twilight and in bright sunlight when disturbed, experimentally infected with malaria)	Matheson	1944
	---; ---; 62, 323 (Standing water, pools, marshes with grass and rushes at margins and duckweed on surface)	Steward & McWade	1961
	---; ---; 62, 323 (Permanent and semi-permanent water with much vegetation, marshes, river overflows)	Dyar	1928
	Fresh water marshes with luxuriant growth of emergents, ricefields, sloughs with water hyacinth; rest by day on emergent vegetation, damp barns, spring houses and under bridges, in light traps, bite day and night, naturally and experimentally infected with malaria, rare; 323°	King et al.	1960
	Standing water, marshes, swamps, ponds and pond holes, mill ponds, lake margins, overflow or rain waters, running waters, creeks and streams, ditches; experimentally infected with *Plasmodium vivax* and *P. falciparum*; 323	Sabrosky	1946
	Under overhanging marginal grasses, flood pools; possible vector of malaria, peak July-Sept.; 323	Knutson	1943
	Semi-permanent ponds, temporary rain pools, shoreline of small stream; hard wood and coniferous forest region; 323	Owen	1937
	Cattail marshes and bogs; vicious biter, May-Nov.; 323	Ross	1947
	Shallow waters containing debris of vegetation; ---; 323	Irwin	1943
	Permanent and semi-permanent fresh-water pools; ---; 323	Darsie et al.	1951
	---; known to be a good experimental vector of *Plasmodium vivax*, enter houses, may be important carrier of malaria; 323	Quinby	1941

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOPHELES *walkeri* Theobald (cont.)	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; April; 323	Wirth	1947
COQUILLETTIDIA *perturbans* (Walker)	Swampy places, attached to roots of aquatic plants; fierce biter, June; 323°	Headlee	1945
CULEX *abominator* Dyar & Knab	---; ---; 323	Stone	1965
absarratus Felt & Young	Cold mountain stream; June; 323	Felt	1904
absobrinus Felt	Cold mountain pool; July and Aug.; 323	Felt	1904
anipe Dyar	Large permanent pool with cattails and *Lemna*, April, rare; 323	Dyar	1928
	Large pond; May; 323	Dyar	1922
	Stagnant, tule-filled stream pool; ---; 323	Freeborn & Bohart	1951
annulatus Schrank	---; ---; 62, 323	Felt	1904
annulirostris Skuse	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
apicalis Adams	---; ---; 5	Tulloch	1934
	Shallow surface pools protected by willow growth, open meadow swales, roadside pools and ditches, permanent swamps and cottonwood flood swamps, prefer clean water; hibernate among crevices in stones over a spring in woods, April, June-Oct., fairly common; 62	Hearle	1926
	Permanent pools and sloughs; woods; 62	McLintock	1944
	Bodies of water polluted with sewage, pond with muddy bottom in sphagnum bog; ---; 62	Twinn	1944
	Cool water shaded by grass; ---; 62	Rempel	1950
	Semi-permanent and permanent pools, in streams and in swamps; enter houses, common amongst vegetation and shelters near their breeding places, all year; 323	Carpenter et al.	1946

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS, ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *apicalis* Adams (cont.)	Mat, beach and swamp pools, margins of lake; in dark recesses of stumps and logs, abundant; 323	Irwin	1943
	Woods, open pools, streams; peak June; 323	Horsfall	1936
	Grassy pools, swampy places with vegetation; common; 323	King et al.	1939
	Marshy places, margins of semi-permanent and permanent ponds, temporary rain pools, open bogs, shaded woodland pools, cool forest pools, ---; 323	Owen	1937
	Open marshes, moderately shaded pools with clear water; ---; 323	Ross	1947
	Permanent pools with aquatic vegetation, artificial containers; ---; 323	Komp	1923
	Deep, dark woodland pools, grassy pools; ---; 323	Mail	1934
	Algae filled spring branches and ponds; ---; 323	Shields	1938
	Running and pooled streams; ---; 323	Rozeboom	1942
	Marshy areas of the lake; ---; 323	Quinby	1941
	Potholes; ---, 323	Olson & Keegan	1944
	---: diurnal; 323	Bick	1946
	---; rare; 323	Stearns et al.	1933
	---; ---; 351 (Grassy pools, edges of ponds, common in swampy areas, meadows-lands and rarely about dwellings, bites man)	Matheson	1944
arizonensis Bohart	---; ---; 323	Stone	1965
atratus Theobald	Abandoned fish pools, brackish roadside pool, man-made well in limestone; in light traps, rare; 323	King et al.	1960
	Ground pools; ---; 323	Carpenter et al.	1946
atropalpus Coquillett	Small rock pools beside streams, water-filled potholes at rivers edge; ---; 323	Felt	1904

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *aurifer* Coquillett	Large bodies of water, cranberry bog; April and May; 323	Felt	1904
badgeri Dyar	---; ---; 323	Freeborn	1926
bahamensis Dyar & Knab	Underground cistern with brackish water, abandoned fish pool, brackish pothole or pool; rare; 323	King et al.	1960
	Temporary rain pools; ---; 323	Fritchard et al.	1947
	---; in light traps; 323	Fisk	1939
boharti Brookman & Reeves	Foothills, areas fed by fresh-water springs, open and shaded pools and streams; May-Oct., rare: 323	Chapman	1966
	Sunlit creek pools with vegetation; lowlands; 323	Freeborn & Bohart	1951
canadensis Theobald	---; abundant in some areas; 62. Low swampy woodlands, woodland springs, pools or ditches carrying spring water; Jan., Feb., March and April; 323	Felt	1904
cantans Meigen	---; common in woods, June and July; 62. Woodland pools and springs; April-Aug.; 323	Felt	1904
cantator Coquillett	Salt marshes; ---; 323	Felt	1904
chidesteri Dyar	Pools with vegetation; ---; 323	Joyce	1948
chrysonotum Dyar & Knab	---; ---; 323	Dohanian	1920
cinereoborealis Felt & Young	Woodland pools; May; 323	Felt	1904
confinis Lynch Arribálzaga	---; Aug.; 62. ---; July; 323	Felt	1904
corniger Theobald	Temporary pools, tree holes, artificial containers; ---; 323	Matheson	1944
	---; ---; 323 (Dirty ground pools, coconut husk and bamboo joints)	Dyar	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *coronator* Dyar & Knab	Ground puddles in open country; Aug.; 323	Dyar	1922
	Shallow pools; May; 323	Beyer	1923
	Temporary pools, artificial containers; ---; 323	Matheson	1944
	---; ---; 323°	McGregor & Eads	1943
coronator *coronator* Dyar & Knab	---; ---; 323	Lane	1953
cubensis Bigot	Old vat on wharf, drain water in a cellar, pools in streambed, artificial containers; nuisance at night, common; 323°	Dyar	1907
declarator Dyar & Knab	---; ---; 323 (Treeholes, small, usually dirty ground pools, rockholes)	Dyar	1928
degustator Dyar	---; open woods, garden, gutter, nocturnal, Feb., Aug.; 323	Beyer	1923
	---; June, 323	Dyar	1922
discolor Coquillett	---; June-Aug., rare; 323	Felt	1904
dupreei Coquillett	Woodland pool; July-Sept.; 323	Felt	1904
dyari Coquillett	Slow cold stream in woods; May; 62. Cold permanent spring; ---; 323	Felt	1904
egberti Dyar & Knab	Permanent water containing grass and other vegetation; Jan., July, Aug., Oct. and Nov.; 323	Dyar	1922
elevator Dyar & Knab	---; ---; 323	Pritchard et al.	1947
erraticus (Dyar & Knab)	Grassy permanent ponds and swampy areas with *Lemna*, ricefields, ponds with cattail and water primrose; outdoors at night, bite all day in some areas, light traps, common; 323°	King et al.	1960
	Permanent bodies of water with vegetation; bites in woods by the margins of ponds and streams; 323	Dyar	1922
	Hollow logs and stumps, ground pools in river bottom, cypress brakes, severe biter; 323	Dyar	1928
	Common in impoundments; occasionally bites man 323	Rozeboom	1942

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *erraticus* (Dyar & Knab) (cont.)	Permanent waters of duckweed; enter houses; 323	Komp	1923
	Permanent ponds supporting growth of aquatic floating plants, usually in shaded areas; ---; 323	Rowe	1942
	Sewage-polluted water, stream bed, temporary floating-plant debris; ---; 323	Darsie et al.	1951
	Pothole; ---; 323	Bick	1946
	---; prevalent whenever bright daylight is reduced, bites as twilight nears; 323	Quinby	1941
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; March-Jan.; 323	Carpenter & Chamberlain	1946
erythrothorax Dyar	Permanent seepage pools along creeks with luxuriant growth of *Typha* and *Scirpus*; in light trans; 323	Menzies et al.	1955
	Open permanent ponds and springs with *Scirpus olneyi* and tule; bite all day, all year; 323	Chapman	1966
	Large tule pools, great abundance in tule swamp where red-winged blackbirds congregated; ---; 323°	Freeborn & Bohart	1951
	Long standing or permanent ponds with vegetation; ---; 323	Dyar	1922
	Large shallow pools; ---; 323	Matheson	1944
fatigans Wiedemann	---; naturally infected with *Wuchereria bancrofti*; 323	Manson-Bahr	1959
federalis Dyar	Heavily tule shaded pool of sewer farm; ---; 323	Herms	1934
fitchii Felt & Young	Permanent woodland pool; May, 323	Felt	1904
floridanus Dyar & Knab	Permanent water with vegetation; July-Aug., Dec., rare; 323	Dyar	1922

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX			
homoeopas Theobald	---; Oct.; 323	Dyar	1922
impiger Walker	---; ---; 5, 62. Woodland pools; May, common; 323	Felt	1904
inhibitator Dyar & Knab	Grassy pools; June-July; 323	Horsfall	1936
interrogator Dyar & Knab	---; ---; 323	Stone	1965
iolambdis Dyar	Brackish water and roadside pool, pools among aerial roots of black mangrove; attracted to light traps, rest on tree trunks and decaying branches, rare; 323	King et al.	1960
	Mangrove swamp, rims of small pond; ---; 323	Pratt & Seabrook	1952
jamaicensis Theobald	Rain and mud pools, open sewer drain; ---; 323	Felt	1904
lazarensis Felt & Young	Deep cold mountain pool; May and June; 323	Felt	1904
magnipennis Felt	Shaded pool; Aug.; 323	Felt	1904
melanurus Coquillett	---; ---; 62, 351 (Small collections of permanent water in swamps, passing the winter as full-grown larvae under the ice, rare)	Dyar	1921
	Cold spring pools in *Sphagnum* swamps; early Aug., summer; 323	Headlee	1945
mulrennani Basham	Potholes, man-made well in limestone formation; limestone solution holes, in light traps, rare; 323	King et al.	1960
nemorosus Meigen	---; ---; 62	Felt	1904
nigripalpus Theobald	Fresh-water marshes; attracted to light traps, common; 323°	King et al.	1960
	Ditches, grassy pools, street catch basins, artificial containers; in houses, rare; 323	King et al.	1939
	Highly organic waters; experimental transmission of St. Louis encephalitis; 323	Sudia & Chamberlain	1964
	Pothole; diurnal; 323	Bick	1946

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *nigripalpus* Theobald (cont.)	Swamps; ---; 323	Matheson	1944
	---; experimentally infected and possible vector of St. Louis Encephalitis; 323	Chamberlain et al.	1964a
	---; all year; 323	Carpenter & Chamberlain	1946
	---; ---; 323*	Low et al.	1964
onondagensis Felt	---; near lake, Sept.; 323	Felt	1904
opisthopus Komp	---; ---; 62	Stone	1965
	Land crabholes in a maple and cypress swamp; in light traps, rare; 323	King et al.	1960
	---; bites occasionally; 323°	Seabrook	1951
peccator Dyar & Knab	---; ---; 62	Stone	1965
	Grassy pools in marshy areas with emergent vegetation; overwinter in caves and other shelters, in light traps, rare; 323	Breeland et al.	1961
	Swampy backwash; tree hollow and underbrush; 323	Rozeboom	1942
	Pools in dense woods; peak in June; 323	Horsfall	1936
	Water-filled, roadside ditch containing emergent and floating vegetation; ---; 323	Darsie et al.	1951
	Small pools in marshy areas; ---; 323	Matheson	1944
	Stream pools; ---; 323	Wirth	1947
	---; April-Dec.; 323	Carpenter & Chamberlain	1946
peus Speiser	Valleys and at 6,400 feet elevation, seep ponds and potholes, roadside ditches, sewage disposal plants and waterbarrels, abundant in polluted situations; May-Nov.; 323	Chapman	1966
pilosus Dyar & Knab	Shallow, grassy pools, roadside ditches, hoofprints and flooded areas; rare in many areas; 323	King et al.	1939
	Temporary or permanent pools with vegetation; ---; 323	Matheson	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *pilosus* Dyar & Knab (cont.)	Marsh; ---; 323	Bick	1946
	---; in light traps, rare; 323	King et al.	1960
	---; March-Dec.; 323	Carpenter & Chamberlain	1946
pipiens Linnaeus	Domestic, rainwater barrels, artificial containers and ground pools with foul water; enter dwellings, hibernate in cellars and other protected places, Jan., March-May, Aug.-Oct., rare; 62°	Hearle	1926
	Lake water highly polluted with sewage, rain pools, sluggish stream; in houses, light traps, nocturnal; 62. ---; light traps; 327	Twinn	1944
	---; June-July; 62 (Small pools or marshy spots near dwellings)	Winn & Beaulieu	1915
	---; ---; 62 (Temporary and permanent pools, near habitations, troublesome biter at night, all summer, peak June, hibernate in basements and caves)	Steward & McWade	1961
	Temporary and permanent pools, artificial containers, polluted places; enter houses, overwinters in basements, root cellars and other shelters, experimentally and naturally infected with western equine encephalomyelitis and St. Louis encephalitis, experimental vector of Japanese B encephalitis, rare in some areas; 323	Stage et al.	1952
	Sometimes dirty ditches and ground pools, near habitations, domestic, enters houses freely, troublesome biter at night; 323°	Lowry	1929
	Leather leaf bog, pools bordering the swamp, upland quarries; rarely a pest; 323	Knutson	1943
	Large mat pools; rare; 323	Irwin	1943
	Gutters; domestic, nocturnal; 323	Beyer	1923
	Cesspools, polluted cat-tail swamps, small streams, water-holding receptacles about dwellings; ---; 323	Stearns et al.	1933
	Stagnant fresh water pools and in water on the salt marsh; ---; 323	Headlee	1945
	Accumulation of non-saline water; ---; 323	Freeborn & Bohart	1951

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
pipiens Linnaeus (cont.)	Domestic and semi-domestic pools; ---; 323	Ross	1947
	Almost any type of fresh water; ---; 323	Darsie et al.	1951
	Fresh water pond, cranberry bog; ---; 323	Bast	1963
	Ditches, cesspools; ---; 323**	Carpenter et al.	1946
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; abundant in urban areas, Apr.-Dec.; 323	Fellton et al.	1950
	---; light traps; 323	Edman & Dorme	1964
	---; Jan.-Oct.; 323	Carpenter	1952
pipiens fatigans Wiedemann	---; ---; 323	Manson-Bahr	1959
pipiens molestus Forskal	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
pipiens pallens Coquillett	---; ---; 323	Stone	1965
pipiens	---; ---; 62	Stone	1965
pipiens pipiens Linnaeus	Domestic, artificial containers, street gutters, catch basins, open cesspools, polluted ground-pools; winters in barns, cellars and outbuildings, serious pest, night biter in cities and towns, considered to be the principal vector of St. Louis encephalitis, experimental vector of western equine and St. Louis encephalitis, considered to be an efficient vector of human filaria, rare; 323°	King et al.	1960
	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
	---; May-Jan.; 323	Breeland et al.	1961
pipiens quinquefasciatus Say	Urban domestic, street gutters, storm-water catch basins, cesspools, open septic tanks, polluted ground pools, artificial containers; in light traps, night biting, serious house pest, experimental vector of St. Louis encephalitis, naturally infected with western equine encephalitis, host of human filaria; 323°	King et al.	1960

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX			
pose Dyar & Knab	---; April and Nov.; 323	Dyar	1922
pyrenaicus Brolemann	---; ---; 323	Séguy	1924
quinquefasciatus Say	Artificial containers, street gutters, catch basins, polluted ground pools; domestic, bites at night in houses, common; 323°	King et al.	1939
	Surface water, ditch; bites by day; 323	Bick	1946
	Pools; domestic; 323	Matheson	1944
	Sewage contaminated water, cesspools and open sewers; - -; 323*	Komp	1923
	Stream pools, springs and seepages and rain pools; ---; 323	Rozeboom	1942
	Domestic and semi-domestic containers; ---; 323	Ross	1947
	---; light trap; 323	Tate & Gates	1944
	---; experimental transmission of St. Louis encephalitis; 323*	Chamberlain et al.	1964
	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; all year; 323	Carpenter & Chamberlain	1946
reevesi Wirth	Tule filled stream pools; ---; 323	Freeborn & Bohart	1951
restuans Theobald	Dirty pools and artificial containers; rare; 62	Rempel	1953
	---; ---; 62, 323 (Woodland pools, stagnant ditches, all summer, overwinter in sheltered places)	Steward & McWade	1961
	Permanent and semi-permanent ground pools, ditches, rainbarrels, prefer somewhat foul water with decaying grass and leaves, hollow stumps and basal cavities of gum trees; least abundant in summer, common; 323°	King et al.	1960

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *restuans* Theobald (cont.)	Quiet natural pools, large and small mat pools, marginal waters of lake, drain basin of septic tank rich in organic matter; abundant; 323	Irwin	1943
	Ditches, woodland and stream pools, artificial containers; enter houses, troublesome biters, abundant in late winter and spring months; 323	Carpenter et al.	1946
	Clean water; domestic, troublesome; 323	Headlee	1945
	Hollow stumps, tree holes, septic tanks, old boats, stagnant pools, artificial containers, temporary puddles, old tires; ---; 323	Shield	1938
	Woodland pools with rotting leaves, in watering troughs along roadsides; ---; 323	Matheson	1944
	Unstocked fish ponds, semi-domestic and water holes; ---; 323	Ross	1947
	Foul water in small depressions, hoofprints: ---; 323	Freeborn & Bohart	1951
	Fresh water pond, cranberry bog; ---; 323	Bast	1963
	Springs, seepages and stream pool; ---; 323	Rozeboom	1942
	Swamp waters; ---; 323	Dickinson	1944
	Salt marsh; ---; 323	Darsie et al.	1951
	---; all year; 323	Carpenter & Chamberlain	1946
salinarius Coquillett	Small, shallow, dirty streams; at light traps, fields, bites man readily in the evening; 62°	Twinn	194[illegible]
	---; ---; 62	Twinn	1949
	Grassy pools, fresh or brackish water, in ditches, ponds and artificial containers; enter houses, bites indoors and outdoors, all year, peak April-Oct.; 323°	Carpenter et al.	1946
	Grassy pools of fresh or brackish water, bilge water of boats and barrels; common along coast, enter houses, bite freely outdoors at night, common; 323	King et al.	1939

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *salinarius* Coquillett (cont.)	Ditches, marshy places, water barrels, fairly clean fresh-water sites; attracted to light traps emitting CO_2 abundant; 323	King et al.	1960
	Pools on salt marshes or adjacent upland; domestic, may prove troublesome; 323	Headlee	1945
	Brackish swamp; common in summer and autumn; 323	Barber	1939
	Surface water, artificial container; diurnal; 323	Bick	1946
	Swampy edges of lakes, oxbow pools, various types marshes, ponds, cattle tracks, cattail bogs, stump holes and polluted ditches; ---; 323	Ross	1947
	Fresh water pools near sea and inland, brackish waters; ---; 323	Komp	1923
	Stream pools, springs, seepages and temporary rain pools; ---; 323	Rozeboom	1942
	Foul, stagnant pool contaminated with sewage; ---; 323	Olson & Keegan	1944
	Occasionally fresh water pond and cranberry bog; ---; 323	Bast	1963
	Permanent pools, temporary rain pools in the open; ---; 323	Dickinson	1944
	Margins of semi-permanent ponds, marshes; ---; 323	Owen	1937
	Cranberry and leather leaf bogs, ---; 323	Knutson	1943
	Swamp, salt hole; ---; 323	Stearns et al.	193[illegible]
	Woodland pool; ---; 323	Breland	1947
	Beach pool; ---; 323	Irwin	1943
	Gutters; ---; 323	Beyer	1923
	---; enters houses and bites during the evening; 323	Matheson	1944
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *saxatilis* Grossbeck	Surface pools and ditches mainly protected by willow or other growth; ---; 62	Hearle	1921a
	Rock-bottomed pool in mountain; Aug.; 323	Headlee	1945
serratus Theobald	Fresh-water pools in low swampy woodland; July, Sept. and Oct.; 323	Felt	1904
similis Theobald	Permanent pools in swamps and coral rockholes with vegetation, occasionally in clear wells; Mar. and Oct.; 323	Dyar	1922
sollicitans Walker	On or in black mud, base of grass stems, salt marshes, brackish or salt water and fresh water, puddles and ditches; most annoying, July and Sept., abundant; 323°	Felt	1904
spissipes (Theobald)	---; ---; 323	Dohanian	1920
squamiger Coquillett	---; ---; 323	Felt	1904
stigmatosoma Dyar	Streambed pools, fountains and water troughs; May-July; 323	Dyar	1922
	Sewer farms, non-saline water in ground pools and artificial containers; ---; 323	Freeborn & Bohart	1951
	Grassy edges of permanent water; ---; 323	Matheson	1944
	---; naturally infected with western equine encephalomyelitis, common; 323	Stage et al.	1952
sylvestris Theobald	---; July; 62. Fresh-water and open swamps, dark woodland swamps, cattail areas; enter houses, June-fall, common; 323°	Felt	1904
taeniorhynchus Wiedemann	Woodland; ---; 323	Felt	1904
tarsalis Coquillett	Open surface rain pools, flooded fields, roadside ditches, sloughs, permanent swamps and ponds, cottonwood flood swamps. in foul water; in outhouses by day, bite very painful, most active at dusk, fairly common 62	Hearle	1926
	Irrigated areas, pools, seepage pools of main canals, laterals and supply ditches; bite after sunset, incriminated as vector of western equine encephalitis, May-Sept.; 62	Shemanchuk	1959

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX tarsalis Coquillett (cont.)	Small temporary weedy roadside ditches; enter houses, bite at dusk and by day; 62*°	Rempel	1953
	Barrels; ---; 62	McLintock	1944
	Hoofprints by the creek; ---; 62	Twinn	1944
	---; ---; 62, 323 (Fresh or rather foul water, ground pools, roadside ditches, irrigated water, rain-water barrels, readily enter houses after dark, bite is painful and swells for hours, naturally infected and capable of transmitting St. Louis and western encephalitis)	Carpenter et al.	1946
	Clear, fresh, alkaline or foul, stagnant water containing organic material, open sunlit places, also shade woodland pools, either small or large bodies of water, including vegetated margins of lakes or ponds, marshes, stream pools, irrigation and road ditches, gutters, drainage, cesspools and seepage pools, liquid manure, artificial containers, arid regions, including hot irrigated valleys, plains, prairies up to 9,000 feet; occasionally bite man, bite sometimes causes inflammatory reaction in human beings, attracted to light, enter dwellings readily, naturally infected with western equine encephalomyelitis, suspected vector of St. Louis encephalitis, April-Feb., peak July-Sept.; 323*	Jenkins	1950
	Artificial containers to mountain meadow pools up to 9,500 feet elevation, common adjacent to hot springs, prefer alkaline seep areas, permanent and temporary pools, irrigation drain ditches and tail-end water from irrigation; overwinter in cellars and damp, abandoned mines, night-biting; 323°	Chapman	1966
	Swampy areas, stagnant pools contaminated by refuse from slaughter yards, hoofprints in pastures, seepage, small temporary rain pools on open prairies; occasionally attack man in the open, known to be able to transmit western equine and St. Louis encephalitis viruses; 323	Tate & Gates	1944
	Roadside pool, small permanent pool, cattail pool, tracks in permanent swampy ground, deep water in cattail swamp, alkali pools near swamp, permanent swamp along railroad, rain pools in marshy ground; near habitation; 323	Parker	1916

TABLE 1 MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
COLEX *tarsalis* Coquillett (cont.)	Waters of permanent, intermittent or permanent nature in ponds, streams, bed pools, rain pools, pasture potholes, marshes and flooded areas, slow-flowing streams; bites after dusk; 323	Rowe	1942
	Reservoir margins, cooler water in drainage ditches, pool filled with algal growth, *Chara*, sewage lagoon, flooded vegetation and pasture-lands, driftwood and debris accumulations in caves; potential vector of encephalitis; 323	Edman	1964
	Barnyard puddles, stream margins; naturally infected with St. Louis encephalitis, experimentally infected with Japanese B and California encephalitis, abundant; 323	Stage et al.	1952
	Ditches, seepage areas, grassy pools and ponds, unshaded swampy places, floodwaters, clay borrow pit, hoofprints, polluted pools, ra. . 323	King et al.	1960
	Permanent or semi-permanent water, water containing algae, cattails and aquatic vegetation; ---; 323	Mail	1934
	Gently flowing streams, lakes, swamps, impoundments, springs; attracted to light traps; 323	Rozeboom	1942
	Foul pools about slaughter yards, corrals and similar places; bites man at dusk; 323	Matheson	1944
	Clay borrow pits; rare in the Southeast and common in the west; 323	King et al.	1939
	Hoofprints, backwaters and a drainage backwater with high pollution of sulfuric acid waste; ---; 323	Ross	1947
	Roadside overflow pools with much algae; ---; 323	Aitken	1940
	Open bogs, lakeshores; ---; 323	Owen	1937
	Hot springs; ---; 323	Dyar	1923
	Rice fields; ---; 323*	Freeborn & Bohart	1951
	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
	---; only below 7500 feet elevation; 323	Harmston	1949
	---; March; 323	Herms	1934

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX territans Walker	Clear water in grassy permanent ponds; May; 5. Shallow, weedy permanent pool; ---; 62	Rempel	1953
	Permanent or almost permanent pools, ponds, lake shores; ---; 5	Gjullin et al.	196[illegible]
	---; hibernate below snow in clumps of *Calamagrostris* grass; 5	Hopla	1965
	---; ---; 5, 323. ---; ---; 62 (Permanent and temporary pools, swamps and bogs, all summer)	Steward & McWade	1961
	Barrels, sloughs, ditches; in houses, June-Sept.; 62	McLintock	1944
	---; common; 62	Twinn	1926
	---; ---; 62, 323 (Dirty pools, artificial containers, woods, semi-domestic, troublesome)	Dyar	1928
	Dirty ground pools, stagnant ditches, artificial receptacles; semi-domestic, enters houses freely, annoying biter; 323°	Lowry	1929
	Grassy pools, ditches, open swampy places with vegetation; in light traps, common; 323	King et al.	1960
	Rainbarrels; seldom enter houses; 323	Komp	1923
	Clean water, occasionally in puddles, rarely in rain barrels; April; 323	Headlee	1945
	Dirty pools, artificial receptacles, permanent and semi-permanent shaded pools with decaying leaves; ---; 323	Mail	1934
	Marshy localities, temporary ground pools semi-permanent and permanent ponds, woodland pools; ---; 323	Owen	1937
	Abandoned quarry with growth of cattail and polluted with garbage, grass-congested roadside ditch; ---; 323	Stearns et al.	1933
	Fresh water pond, occasionally cranberry bog; ---; 323	Bast	1963
	Semi-shaded and open grassy pools; ---; 323	Stage et al.	1952
	Leather leaf bog; ---; 323	Knutson	1943
	---; May-Nov.; 323	Fellton et al.	1950
	---; light traps; 327	Twinn	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULEX *testaceus* van der Wulp	---; April, June, Oct.; 62. ---; ---; 351 (Grassy marshes, all summer)	Dyar	1921
	---; May, rare; 62	Twinn	1926
	Gutters and pools of rain water; ---; 323	Beyer	1923
thriambus Dyar	Shaded fresh-water springs, June and July, rare; 323	Chapman	1966
	Riverbed pools; Aug.; 323	Dyar	1922
	Leaf-filled rock pools along stream; ---; 323	Freeborn & Bohart	1951
triseriatus Say	Artificial containers; June and July; 323	Felt	1904
trivittatus Coquillett	Woodland pools; July-Sept.; 323	Felt	1904
CULICELLA *alaskaensis* (Ludlow)	---; ---; 5, 62, 323 (Stagnant pools in mountainous river valleys, high altitudes)	Dyar	1928
dyari (Coquillett)	---; June, July, rare; 62	Dyar	1920
	Cold woodland spring pools; May, Aug.; 323	Dickinson	1944
	Cold spring or bog pools, rare; 323	Lowry	1929
impatiens (Walker)	---; abundant below Arctic Circle; 5. ---; in forests; 323 (Dark and shaded pools, large, cool, clear springs, bite after sunset)	Dyar	1928
	Springs and spring-fed pools in woodlands; April, May, July-Sept.; 323	Dickinson	1944
	Permanent forest pools; rare; 323	Lowry	1929
insidens (Thomson)	---; ---; 5, 323 (Ground pools contaminated by vegetable matter, artificial containers, water barrels on railroad trestles, rare)	Dyar	1928
inornata (Williston)	---; ---; 62 (Old stagnant permanent pools, artificial containers)	Dyar	1928
	Permanent pools, occasionally artificial containers; Aug.-Nov.; 323	Dickinson	1944
	Permanent stagnant ground pools; ---; 323	Lowry	1929

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICELLA			
mackenzieae Dyar & Knab	---; ---; 323 (Old stagnant permanent pools, rare)	Dyar	1928
melanura (Coquillett)	Cold springs or permanent bog pools; rare, Aug., Sept.; 323	Lowry	1929
	Springs and spring-fed pools, cold bogs; May, June; 323	Dickinson	1944
	---; ---; 323*	Beadle	1952
parodites Dyar	---; May, June and July; 323	Dyar	1928
CULISETA			
alaskaensis (Ludlow)	Common in *Carex* swamps, edges of pools and ponds, coastal marshes with vegetation usually open and unshaded; bites all day; 5°	Rempel	1953
	Shallow semi-permanent or permanent pools clogged with debris and vegetation; forested lowland, May-June; 5	Gjullin et al.	1961
	Dystrophic ponds within bogs, dense clumps of dead *Carex*; ---; 5	Frohne	1956
	Permanent, long standing water, fresh water marsh, bog; ---; 5	Frohne	1954
	---; sheltered and shaded niches and crevices on cliffs and on the underside of boulders; 5	Sommerman	1964
	---; hibernate below snow in clumps of *Calamagrostis* grass; 5	Hopla	1965
	---; April-Sept.; 5	Stage & Chamberlain	1945
	---; ---; 5, 62, 323 (In late spring and summer in open pools, riverbeds)	Steward & McWade	1961
	Grassy pools along riverbeds; plains; 62	Dyar	1920
	Irrigated areas; ---; 62	Shemanchuk	1959
	---; open rocky country and moist spruce forests up to 1000 feet elevation, day biter; 62	Jenkins & Knight	1950
	---; bites in swampy forest, bite by day and early evening; 62°	Twinn et al.	1948

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULISETA alaskaensis (Ludlow) (cont.)	---; April-July; 62. ---; ---; 323 (Grassy marshes, generally in river valleys, adults pass winter hiding in hollow logs and appear very early in the spring, bite man)	Dyar	1921
	---; very rare; 62	Hearle	1926
	---; May; 323	Dyar	1929
	---; light traps; 327	Twinn	1944
dyari Coquillett	---; May-July; 62. ---; ---, 351 (In the spring in cold bogs, males attracted to light)	Dyar	1921
	Spring in cold bogs; readily attracted to lights, May, July-Aug.; 323	Dyar	1922
impatiens (Walker)	Dystrophic ponds within bogs, dense clumps of dead *Carex*; will bite at near freezing temperatures in early spring, frisking on the wing and resting on the snow, Jan.-March; 5°	Frohne	1956
	Semi-permanent or permanent pools; ---; 5	Gjullin et al.	1961
	Bog pools; ---; 5	Frohne	1954
	---; sheltered and shaded niches and crevices on the cliff, underside of boulder; 5	Sommerman	1964
	---; Apr.-Sept.; 5	Stage & Chamberlain	1945
	---; ---; 5, 62, 323 (Snow pools, ponds, and roadside puddles, March-early autumn, bite readily all day)	Steward & McWade	1961
	Dark permanent forest pools, shallow pools beside railroad tracks, dirty roadside pools; wooded mountain slopes, fairly common; 62	Hearle	1926
	---; feeds at dusk and vicious biter by day, but not in strong wind, May; 62°. Dark permanent forest pools, muddy water in road ruts; common from coast to coast; 323°	Rempel	1953
	---; in white spruce-lichen and spruce-moss forests up to 700 feet elevation; 62	Jenkins & Knight	1950
	---; May-Aug.; 62	Dyar	1920

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULISETA impatiens (Walker) (cont.)	Shaded spring or snow-fed pools; rare in some areas; 323	Stage et al.	1952
	Dark, clear, woodland pools; fly after sunset; 323	Matheson	1944
	---; May-Aug.; 323	Harmston	1949
	---; Sept.; 323	Blickle	1952
	---; common, 323	Parker	1916
incidens (Thomson)	---; May-June; 5	Stage & Chamberlain	1945
	---; rare; 5	Frohne	1956
	---; ---; 5, 62, 323 (Dirty, permanent pools, artificial containers, rarely bites man)	Dyar	1921
	---; ---; 5, 323 (Permanent pools, all year, hibernates as adults)	Matheson	1944
	Domestic, rainwater barrels, dirty salt-water pools, filthy ditches, ponds, clean woodland pools, open sloughs, rain-filled depressions in woods, edges of cottonwood flood swamps; hibernate in sheltered places, indoors, March and April, abundant; 62°	Hearle	1926
	Artificial pools or barrels; coastal regions, May-Sept.; 62	Dyar	1920
	Artificial containers; rarely bites man; 62	Rempel	1953
	Permanent and semi-permanent pools, artificial containers; experimentally infected with western equine encephalomyelitis, St. Louis and Japanese B encephalitis, abundant; 323	Stage et al.	1952
	Horse troughs; lower elevations and up to 8,000 feet; 323	Freeborn & Brookman	1943
	Permanent dirty pools; adults hibernate; 323	Dyar	1922
	Brackish water, spring water and snow pools in the mountains; ---; 323°	Freeborn & Bohart	1951
	---; experimental transmission of Japanese B encephalitis; 323	Hammon et al.	1949
	---; May, July-Sept.; 323	Harmston	1949

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULISETA inornata (Williston)	Shallow grassy depressions, amongst slough grass and wild barley, in stagnant highly alkaline water with sedges and bulrush, also in clear water depressions with clay bottom; enter houses in the fall to hibernate, potential vector of western equine encephalomyelitis and St. Louis encephalitis; 62	Rempel	1953
	Irrigated areas, pools, seepage pools of main canal, laterals and supply ditches; in visual-attraction traps, possible vector of western equine encephalitis, May-Sept. and Nov.; 62°	Shemanchuk	1959
	Roadside pools, edges of cottonwood flood swamps, permanent water pools, streambeds, artificial containers; fairly common; 62	Hearle	1926
	Weedy roadside ditches temporarily filled with water, grassy pasture depressions, semi-permanent depressions in bluffs, permanent depressions in partly dried-up streambeds; ---; 62	Rempel	1950
	---; Oct.; 62 (Permanent ground pools)	Dyar	1921
	---; ---; 62. Brackish coastal water; ---; 323 (Rarely bite man)	Steward & McWade	1961
	Poorly drained irrigated areas, shaded pools in forests up to 6000 feet elevation; naturally infected with western equine encephalomyelitis, experimental vector of St. Louis and Japanese B encephalitis, abundant; 323°	Stage et al.	1952
	Open grassy pools, lily ponds and polluted water, swampy areas; bites man occasionally, light trap, July-Sept., experimental transmission of western equine and St. Louis encephalitis; 323	Tate & Gates	1944
	Margins of ponds and permanent pools; numerous at times, very frequently enters houses, rarely bites man; 323	Beyer	1923
	Marshes, sinkholes, stump holes and artificial ponds; overwinter in houses and bite ferociously; 323	Ross	1947
	Open grassy pools, ditches, marshes, artificial containers; bite mostly evening and night, common; 323°	King et al.	1960
	Shaded, semi-permanent roadside pool; ---; 323	Darsie et al.	1951

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULISETA inornata (Williston) (cont.)	Ex inct hot springs; ---; 323	Dyar	1923
	Wet meadow; ---; 323	Lake	1953
	---; below 8000 feet elevation; 323	Harmston	1949
	---; Sept.-June; 323	Carpenter & Chamberlain	1946
maccrackenae Dyar & Knab	---; rare; 5	Frohne	1956
	Pools overgrown with vegetation; rare; 323	Stage et al.	1952
	Pools in streambeds with vegetation; ---; 323	Dyar	1922
	Cool, clear pools in deep shade; ---; 323°	Freeborn & Bohart	1951
	Wooded and coastal regions; ---; 323	Matheson	1944
melanura (Coquillett)	---; ---; 62, 323 (Permanent water in swamps, overwinters under the ice)	Matheson	1944
	Small permanent water collections with or without vegetation, around bases of trees and stumps, open pools in muck lands, small grassy ponds of dark acid water in wooden swamp, spring water in sphagnum bog; sylvan, attracted to light traps, rare; 323	King et al.	1960
	Sphagrum bogs and cedar swamps, shady, cool, acid water in permanent fresh-water swamps; possible vector of equine encephalitis; 323	Wallis	1960
	Artificial containers; diurnal; 323	Bick	1946
	Fresh water pond, occasionally cranberry bog; ---; 323	Bast	1963
	Shaded, roadside pool; ---; 323	Darsie et al.	1951
	---; naturally infected with eastern equine encephalitis; 323	Beadle	1952
	---; all year; 323	Carpenter & Chamberlain	1946
minnesotae Barr	---; ---; 62, 323	Stone	1965

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULISETA morsitans (Theobald)	Pondlike bog inclusions, mostly in senescent bogs of the *Sphagnum-Ledum-Picea* class, choked with *Myrica gale* or *Carex*; ---; 5	Frohne	1956
	Semi-permanent and permanent pools overgrown with *Carex rostrata*; ---; 5	Gjullin et al.	1961
	---; July-Sept. 5	Sommerman	1964
	Common in habitats containing sedged and in cool shaded pools in a tamarack bog; ---; 62	Rempel	1953
	Common in heath and alder bogs where water is brown and acid; ---; 62. ---; ---; 323 (Marshes, bogs, cold pools, rarely bites man)	Steward & McWade	1961
	Spring-fed forest pools; ---; 62. In holes under old tree stumps, forest pools; ---; 323	Matheson	1944
	Unshaded pools with rank grass and fed by fresh water; rare; 323	Stage et al.	1952
	Tamarack bog, cool shaded pools around base of tamarack hummocks; ---; 323	Ross	1947
	---; April-Oct.; 323	Fellton et al.	1950
parodites Dyar	---; ---; 323	Stone	1965
particeps (Adams)	Roadside ditches; ---; 5	Gjullin et al.	1961
	---; ---; 323	Stone	1965
DEINOCERITES cancer Theobald	Crabholes in marl soil of coastal marshes or in fresh-water swampy places, mostly in brackish or salt water habitats, cypress and maple swamp; rest on sides of crabholes, bite at night, rare; 323°	King et al.	1960
	---; Feb.-Dec.; 323	Carpenter et al.	1946
epitedeus Knab	---; ---; 323	Rueger et al.	1950
mathesoni Belkin & Hogue	Crabholes; in light traps, all year; 323	Peyton et al.	1964

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DEINOCERITES *pseudes* Dyar & Knab	In holes of land crabs, along banks of small lake, brackish water, narrow heavily wooded strip along river bank, on beach; in light traps, on oil tankers, bites readily from dusk to midnight, all year; 323°	Peyton et al.	1964
spurius (Dyar & Knab)	Artificial containers; in light traps, enter houses by night; 323°	Fisk	1941
	Holes of the fiddler crab; nocturnal; 323	Matheson	1944
EUCOPETHRA *underwoodi* Underwood	Predaceous; common; 62, 323	Matheson	1944
HAEMAGOGUS *equinus* Theobald	---; ---; 323 (Arboreal, experimental vector of yellow fever)	Foote & Cook	1959
JANTHINOSOMA *musica* Say	---; July, rare; 323°	Felt	1904
MANSONIA *indubitans* Dyar & Shannon	*Pistia stratiotes*, pickerelweed, arrowhead and water hyacinth; attracted to light traps, bite readily, all year, peaks Sept. and April, abundant; 323°	King et al.	1960
	Common amongst aquatic vegetation; active and troublesome in the evening, rare; 323	Seabrook	1951
perturbans (Walker)	Attach to stems or roots of aquatic plants; rare; 62	Rempel	1953
	---; persistent in entering houses, vicious biter, July and Aug., fairly rare; 62	Hearle	1926
	---; near swamps, crepuscular, June; 62°	Twinn	1926
	---; in woods; 62	Downe et al.	1963
	---; ---; 62, 323 (On surface of ponds and waters with abundant emergent vegetation, spring and summer, attracted to light)	Steward & McWade	1961
	---; ---; 62 (Bites at twilight, late at night and during dark days)	Matheson	1944

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MANSONIA perturbans (Walker) (cont.)	Marshes and lakes with much emergent vegetation, *Typha, Carex, Pontederia, Sagittaria*, lake margins; in light traps, bite readily all day in shady, moist places, more active in early part of night, probable vector of eastern equine encephalitis; 323°	King et al.	1960
	Marshes with cattails and aquatic sedges, pickerelweed and arrowhead; voracious biters, especially on cloudy afternoons and crepuscular periods; 323	Ross	1947
	Permanent grassy swamps or margins of ponds; enter houses freely; 323	Lowry	1929
	Attached to sub-surface vegetation, associated with *Limnobium*; ---; 323	Quinby	1941
	Fresh water; ---; 323	Darsie et al.	1951
	Swamp pools; ---; 323	Knutson	1943
	---; may transmit eastern equine encephalomyelitis in nature, vicious biter, rare in some areas; 323	Stage et al.	1952
	---; experimentally infected with *Wuchereria bancrofti*; 323	Eyles & Most	1947
	---; naturally infected with eastern equine encephalitis; 323	Beadle	1952
	---; very prevalent and annoying during early spring; 323	Beyer	1923
	---; common, March-Dec., peak April, May and Aug.; 323	King et al.	1939
pseudotitillans Theobald	---; ---; 323	Lane	1953
titillans (Walker)	Sometimes pickerelweed, arrowhead and water-hyacinth, attached to floating grass, *Paspalum repens*; bites viciously, rare; 323°	King et al.	1960
	Only on leaves and roots of water lettuce; light traps; 323	King et al.	1939
	---; June-Dec.; 323	Carpenter & Chamberlain	1946
	---; ---; 323 (Bites after dark)	Dyar	1928
MEGARHINUS rutilus (Coquillett)	Tree holes; rare; 323	King et al.	1939
	Bromeliads, predaceous; ---; 323	Seabrook	1951

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MEDAPHINUS septentrionalis Dyar & Knab	Mud puddle; in buildings, rare; 323	Beyer	1923
	Tree holes, rock holes, wooden receptacles, predaceous; ---; 323	Dyar	1928
	Tree holes in oak-hickory woods; ---; 323	Ross	1947
	Tires, artificial container; ---; 323	Lake	1953
	---; Jan., April-Oct.; 323	Carpenter & Chamberlain	1946
	---; Feb., March; 323	Wirth	1947
OPTHOPODOMYIA alba Baker	Tree holes, overwinter frozen in ice; rare; 323	King et al.	1960
	Artificial containers with organic matter; June-Sept.; 323	Breeland et al.	1961
	Soft maple tree hole; ---; 323	Ross	1947
	Tree holes; ---; 323	Matheson	1944
	---: Aug.-Nov.; 323	Barnes et al.	1950
	---, light traps; 323	Carpenter et al.	1945
californica Bohart	Tree holes, usually cottonwood, water of high pH; ---; 323	Freeborn & Bohart	1951
kumi Edwards	---; ---; 323	Stone	1961
signifera (Coquillett)	Water in decayed tree holes; rare; 323	King et al.	1960
	Tree hole, artificial container, highly polluted water; ---; 323°	Darsie et al.	1951
	Swampy area; ---; 323	Knutson	1943
	---; all year; 323	Carpenter & Chamberlain	1946
	---; coastland; 323	Beyer	1923
	---; arboreal; 323	Matheson	1944
PSOROPHORA albipes (Theobald)	---; ---; 323	Lane	1953
champerico Dyar & Knab	---; ---; 323	Lane	1953

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA ciliata (Fabricius)	---; ---; 62 (Small cracks in the soil, in rain pools, temporary waters, predaceous, May-Sept.)	Steward & McWade	1961
	Intermittently flooded grassy pools, ditches and depressions in open fields or marginal woodland area, willow swales; rest by day under vegetative cover, attracted to light, bite severe and persistent day and night, peak near dusk, abundant; 323°	Breeland et al.	1961
	Roadside ditches devoid of vegetation; rare; 323	Stearns et al.	1933
	Woods, open pools; grass, June, Sept.; 323	Horsfall	1936
	Rain pools; bite mostly on cloudy days and evenings; 323	Ross	1947
	Temporary rain pools, streambed pools, pasture potholes and flooded areas, margin or marshes and ponds; ---; 323	Rowe	1942
	Depressions and cracks in soil, natural pools, predaceous and cannibalistic; ---; 323	Schwardt	1939
	Grassy ditches, shallow grassy flats, rice-fields, everglades; ---; 323	King et al.	1960
	Roadside ditch adjoining salt marsh, normally in fresh water; ---; 323	Darsie et al.	1951
	Surface water, pothole, marsh; ---; 323	Bick	1946
	Permanent drainage canals; ---; 323	Beyer	1923
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952
	---; bites at bright daylight; 323	Knutson	1943
	---; March-Oct., Dec.; 323	Carpenter & Chamberlain	1946
	---; in light traps; 323	Edman & Downe	1964
	---; common; 323	King et al.	1939
columbiae (Dyar & Knab)	Ricefields, seepage puddles, natural depressions of soil, drainage and roadside ditches; rest in grass or low vegetation, in cars, most active at night; 323°	Schwardt	1939

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS: ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA columbiae (Dyar & Knab) (cont.)	Open pools, houses; woods, active June-Nov., peak June-Oct.; 323	Horsfall	1936
	Grassy swales and depressions; common; 323	King et al.	1939
	Temporary rain pools, ruts or low places of a temporary nature; ---; 323	Shields	1938
	---; by the sea and on the streets, abundant and annoying; 323	Aitken	1940
	---; Jan.; 323	Beyer	1923
	---; May; 323	Quinby	1941
confirmis (Lynch Arribálzaga)	Damp soil in depressions with vegetation; fierce biters, at night, abundant in the everglades and ricefields, all year, peak May-Oct.; 323°	Carpenter et al.	1946
	Drained and flooded ricefields; serious pest at night and bites all day, especially early morning and on dark days; 323	Horsfall	1942
	Temporary pools, grassy ditches, open grassy swales, ricefields and their ditches; bite in grassy or shady places by day; 323	King et al.	1960
	Artificial containers; common; 323	Rozeboom	1942
	Temporary rain pools of pastures and farm yards and other more or less open situations; ---; 323	Ross	1947
	Shallow ponds, puddles, road ruts; ---; 323	Good	1945
	Surface water, potholes, marsh; ---; 323	Bick	1946
	Irrigation overflow pools; ---; 323	Aitken	1940
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952
	---; light traps; 323	Chamberlain et al.	1964a
ctites Dyar	---; August; 323	Dyar	1918

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA cyanescens (Coquillett)	Transient pools, pool with suspended clay nearly free of vegetaion; fields, thickets, about dwellings, bite in bright sunshine, rare; 323°	King et al.	1960
	Temporary pools in grassy fields and woodlands; bite day and night, vicious and persistent, also in full sunlight, April-Oct., abundant; 323	Breeland et al.	1961
	Shady flood and rain pools; ---; 323	Schwardt	1939
	Temporary rain puddles; ---; 323	Matheson	1944
	Pothole; ---; 323	Bick	1946
discolor (Coquillett)	Temporary ground pools and grassy ditches; attracted to light, bite day and night, abundant; 323°	Breeland et al.	1961
	Temporary rain puddles, brackish water; fly in sunshine, vicious and persistent biters; 323	Beyer	1923
	Grassy pools, ricefields; rare: 323	King et al.	1960
	Rain pools, weed-choked roadside ditch; ---; 323	Ross	1947
	Grassy and polluted ponds; ---; 323	Shields	1938
	---; April-Oct.; 323	Carpenter & Chamberlain	1946
discrucians (Walker)	---; May; 323	Beyer	1923
ferox (Humboldt)	Transient rain puddles; ---; 62°	Matheson	1944
	---; ---; 62, 323 (Temporary rain-filled pools in thickets and woodlands, occasionally in stream-beds, potholes, common in and near thickets or forests, in the south, Mar.-Nov., in the north, May-Sept., persistent and painful biters)	Carpenter et al.	1946
	Temporary pools or depressions in woodlands, grassy pools or ditches on edge of tree growth, puddles from river overflows; bite day or night in or near woods, enter houses, abundant; 323°	King et al.	1960
	Flood pools, stream or river valleys; fierce biters, attack readily in shade during day; 323	Ross	1947
	Temporary rain pools; forests and shady spots, severe biter, common; 323	King et al.	1939

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA ferox (Humboldt) (cont.)	Shaded rain pools; bite readily and attack in the open on cloudy days; 323	Steward & McWade	1961
	Swampy ponds, woodland pools, small marshy creeks; ---; 323	Good	1945
	Shallow pool in area with dense undergrowth; ---; 323	Darsie et al.	1951
	Temporary rain pools in the open; ---; 323	Dickinson	1944
	---; experimental transmission of eastern equine encepnalitis; 323	Beadle	1952
	---; light traps; 323	Chamberlain et al.	1964a
	---; March-Nov.; 323	Wirth	1947
horrida (Dyar & Knab)	Temporary rain pools in wooded areas; in or near woods, bite viciously; 323°	Rowe	1942
	Bottomland pools; bite readily in daytime; 323	Ross	1947
	Shaded temporary pools; rare; 323	King et al.	1960
	Temporary ground pools; ---; 323	Dyar	1922
	Heavily shaded pools; ---; 323	Matheson	1944
	---; Apr.-Sept., attack during day in shade; 323	Carpenter et al.	1946
howardii Coquillett	Shaded temporary pools; bite readily in wood, rare in most areas; 323°	King et al.	1960
	Temporary rainpools, cannibalistic and predaceous; rare; 323	King et al.	1939
	Permanent drainage canals; bite in daytime; 323	Beyer	1923
	Woodland pools, post oak flats of river valley, ruts in pasture; ---; 323	Ross	1947
	Surface water; ---; 323	Bick	1946
	---; experimental transmission of eastern equine encephalitis; 323	Beadle	1952

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA howardii Coquillett (cont.)	---; May-Oct.; 323	Carpenter & Chamberlain	1946
	---; peak June; 323	Horsfall	1936
	---; April; 323	Wirth	1947
jamaicensis Theobald	---; ---; 323	Dohanian	1920
johnstonii (Grabham)	Temporary shady rain pool in limestone depression with *Sesuvium portulacastrum* near buttonwood zone, partially shaded clear water pools with *Bacopa monnieri*, sunlit pothole with decaying vegetation; in light traps, bites all day in shade or bright sunlight, April, Oct., Dec., rare; 323°	King et al.	1960
	Potholes, densely shaded, shallow, rain-filled depression, deep, sunlit pools; ---; 323	Thurman et al.	1951
	---; ---; 323	Stone	1965
longipalpus Randolph & O'Neill	Heavily shaded temporary rain pools; ---; 323	Gerhardt	1966
	---; rare: 323	King et al.	1960
	---; April; 323	Wirth	1947
mexicana (Bellardi)	---; ---; 323	Stone	1965
posticata Wiedemann	Shallow pool formed by overflow of small creek with dense undergrowth; bites severely; 323°	Stearns et al.	1933
	Woods, pools; April, June, peak April; 323	Horsfall	1936
pygmaea (Theobald)	Temporary rain pools; ---; 323	Dyar	1928
	---; in light traps, June-Oct., rare; 323	King et al.	1960
sayi Dyar & Knab	---; Aug.; 62 (Temporary rain puddle, rare, bite in daytime in the open)	Dyar	1921
	Puddles and pools of rain water, especially formed in palmetto flats; bites man viciously by day and enters houses; 323°	Beyer	1923
	---; ---; 323	Séguy	1924
signipennis (Coquillett)	Small transient rain pools; rare; 62°	Rempel	1953
	; ---; 62	Stone	1965

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSOROPHORA signipennis (Coquillett) (cont.)	Temporary rain pools in arid country; bites by day and in the evening; 323	Dyar	1922
	Temporary ground pools, creek pools, in artificial containers; rarely bites man; 323	Rozeboom	1942
	Transient pools and irrigated fields; plains and valleys, in light traps, rare; 323	King et al.	1960
	Flooded areas, intermittent marsh; June-Aug., vicious biter; 323°	Rowe	1942
	River pools; common in summer and autumn; 323	Barber	1939
	Roadside pools, evanescent rain pools in arid plain sections; ---; 323	Mail	1934
	---; May-Oct.; 323	Edman & Downe	1964
texanum Dyar & Knab	---; ---; 323	Dohanian	1920
varipes (Coquillett)	Overflow pools of streams and rivers in dense swamps, in floatage; grasslands, bottomland areas, bite day to dusk, peak afternoon, May-Oct., abundant; 323°	Breeland et al.	1961
	Temporary woodland pools and floodwaters in mats of debris; along streams and rivers, wooded swamps; 323	King et al.	1960
	Temporary rainpools; exceedingly annoying in woods, severe biter, common; 323	King et al.	1939
	Overflow pools; dense woods, peak May, July; 323	Horsfall	1936
	Cypress bottoms; vicious biter. April; 323	Ross	1947
	Shaded temporary water; attack any time; 323	Matheson	1944
STEGOMYIA signifer Coquillett	Somewhat foul water; ---; 323	Felt	1904
TAENIORHYNCHUS perturbans Walker	Marshes and reedy edges of ponds; enters houses, persistent and vicious biter, June and July; 62°	Twinn	1926a
	---; woods; 62	McLintock	1944
	Permanent ponds, lake; enter houses; 323°	Owen	1937
	---; April-Oct.; 323	Wirth	1947

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THEOBALDIA alaskaensis Ludlow	---; ---; 5, 62 (Troublesome, bites above snow, in the tundras)	Martini	1930
	Grassy marshes in river valleys; ---; 323	Mail	1934
dyari Coquillett	---; May and June; 62	Hearle	1927
	---; forests; 323	Séguy	1924
impatiens Walker	---; ---; 5	Freeborn	1926
	Ponds; ---; 62	McLintock	1944
	---; March-Aug.; 62	Hearle	1927
	Deep snow water pools and springs; in mountains in the timbered areas, feed only in the evening about dusk and at times are very vicious, May-Aug.; 323°	Rees	1943
	Deep woodland pools, shallow and well shaded pools, rarely in the open, in water of pH 6.8 to 7.0; numerous in April and May; 323	Mail	1934
	Large mat pool; rare; 323	Irwin	1943
	---; in high mountain woodlands, bites very viciously just at dusk; 323	Rees	1934
incidens Thomson	---; ---; 5, 323 (Mountains and coast)	Séguy	1924
	---; Jan., March-Sept.; 62	Hearle	1927
	Deep spring pools, artificial containers in the vicinity of houses, roadside pools and around artesian wells; occasionally attacks man; 323°	Rees	1943
	Domestic, all types of permanent pools; all year; 323	Freeborn	1926
	Clear, cold spring pools; ---; 323	Rees	1934
	Permanent, foul pools; ---; 323	Mail	1934
inornata (Williston)	Cool, shaded pools; woods, houses; 62	McLintock	1944
	---; March, April and July-Aug.; 62	Hearle	1927
	Snow pools; plains areas and in the mountains up to 9,000 feet, timber regions but also in the open, bite man occasionally especially in the evening or in the shade of the wooded areas; 323°	Rees	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THEOBALDIA inornata (Williston) (cont.)	Spring pools, ponds and streambed pools, permanent ponds and in evanescent rain pools often foul from stagnation or dumpage; April; 323	Rowe	1942
	Permanent pools, partly dried up streams where deeper pool remain; June-Sept., enters houses, occasionally bites man; 323	Mail	1934
	Clear, cool waters of stream pools, seepages and temporary rain pools, abundant in winter; 323	Rozeboom	1942
	Open grassy pools, artificial water containers; common; 323	King et al.	1939
	Swamps; common in summer and autumn; 323	Barber	1939
	Marshes, temporary rain pools, woodland pools, margin of ponds, ---; 323	Owen	1937
	Wet weather pond in an open cow pasture, ditches; ---; 323	Shields	1938
	Large mat pool; ---; 323	Irwin	1943
	---; rare, cooler spring and fall months; 323	Quinby	1941
	---; March-April, peak March; 323	Horsfall	1936
	---; Oct.; 323	Christensen & Harmston	1944
macrackenae Dyar & Knab	---; wooded parts of valley and along coast; 323	Freeborn	1926
melanura (Coquillett)	Permanent leather leaf bogs and river pools, in root holes; July-Nov., peak Oct.; 323	Knutson	1943
	Small permanent collections of water; sylvan, rare; 323	King et al.	1939
	Bases of trees and stumps; ---; 323	Shields	1938
	Pools in sphagnum swamps; ---; 323	Stearns et al.	1933
morsitans (Theobald)	---; May; 62	Winn & Beaulieu	1932
	Deeper pools of lake mat and swamp, shaded portion of beach pool; bases of trees and stumps near breeding pools, May and Aug., common; 323	Irwin	1943

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THEOBALDIA morsitans (Theobald) (cont.)	Seepage, spring-fed pools, root holes with constant level of water; April-July, peak May; 323	Knutson	1943
	Permanent marshy border of lake, intermittent marsh near lake; ---; 323	Rowe	1942
	Cold forest pools, marshes, temporary rain pools; ---; 323	Owen	1937
TOXORHYNCHITES rutilus (Coquillett)	---; ---; 323	Stone et al.	1959
rutilus rutilus (Coquillett)	Tree holes, artificial containers, predaceous and cannibalistic; crepuscular, in woods, rare; 323	King et al.	1960
rutilus septentrionalis (Dyar & Knab)	Tree holes, artificial containers, predaceous and cannibalistic; forests, March, May and Sept., rare, 323	Breeland et al.	1961
	---; active by day and early evening; 323	King et al.	1960
septentrionalis (Dyar & Knab)	Tree holes; ---; 323	Darsie et al.	1951
URANOTAENIA anhydor Dyar	Permanent ponds in spring; rare; 323	Dyar	1922
	Pond filled with cattails; ---; 323	Matheson	1944
	Reedy swamp; ---; 323	Dyar	1907
anhydor anhydor Dyar	---; ---; 323	Stone	1965
anhydor syntheta Dyar & Shannon	---; ---; 323	Stone	1965
coatzacoalcos Dyar & Knab	---; ---; 323	Lane	1953
geometrica Lutz	---; ---; 323	Lane	1953
lowii Theobald	Small ground pools; ---; 5	Dyar	1922
	Ground pools, grassy pond and lake margins, pool with *Myriophyllum verticulatum*; in light traps, rare; 323	King et al.	1960
	---; in building; 323	Beyer	1923
	---; all year; 323	Carpenter & Chamberlain	1946

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
UNANOTAENIA sapphirina (Osten-Sacken)	---; at light; 62 (Permanent pools and ponds with emergent or floating vegetation, bite man)	Steward & McWade	1961
	Permanent pools with water hyacinth, *Piaropus crassipes*; dark moist crevices in walls and between bricks, abundant; 323 (Semi-permanent ground pools, below leaves of *Lemna* warm stagnant pools with *Spirogyra*, bites man)	Hinman	1935
	Permanent pools, ponds and lakes containing emergent and floating vegetation; in damp situations in culverts, amongst vegetation, rarely bites man; 323°	Carpenter et al.	1946
	Permanent grassy pools, swamps and vegetation at lake margins, in *Lemna*; in caves and hollow trees, in light traps, common; 323	King et al.	1960
	Permanent or semi-permanent ponds in weed-choked situations, cattail marshes, dense marginal growth of *Jussiaea*; ---; 323	Ross	1947
	Permanent collections of water, in wet hoof prints, depressions in creek beds, damp under-brush and logs in swamps; ---; 323	Rozeboom	1942
	Meadows, open swamp areas well overgrown with floating vegetation; ---; 323	Headlee	1945
	Marshes, temporary rain pools, bog in sphagnum mat; ---; 323	Owen	1937
	Generally associated with other fresh-water mosquitoes; ---; 323	Darsie et al.	1951
	Ornamental pools, among water chestnut; ---; 323	Good	1945
	Temporary rain pools in the open; ---; 323	Dickinson	1944
	---; grasses at tree bases and stumps in swamps; 323	King et al.	1939
	---; in building; 323	Beyer	1923
	---; all year; 323	Carpenter & Chamberlain	1946
	---; rare; 323	Stearns et al.	1933

TABLE 1 - MOSQUITOES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
UPANOTAENIA			
socialis Theobald	Permanent pools; ---; 323	Dyar	1922
syntheta Dyar & Shannon	Swamps and riverbeds; common in summer and autumn; 323	Barber	1939
	Ground pools; ---; 323	Dyar	1928
WYEOMYIA			
bahama Dyar & Knab	---; ---; 323	Bonne & Bonne-Wepster	1925
haynei Dodge	Pitcher plant *Sarracenia purpurea venosa*; rare;	King et al.	1960
	---; in sandy areas overgrown with scrub oak; 323	Dodge	1947
mitchellii (Theobald)	Only at the base of epiphytic Bromeliaceae leaves; bite readily all day in shady humid woodlands, yards, greenhouses with bromeliads, all year, rare; 323[a]	King et al.	1960
	---; occasionally bite man; 323	Carpenter et al.	1946
	---; in light traps; 323	Chamberlain et al.	1964 a
smithii (Coquillett)	In leaves of pitcher plants, where they overwinter, growing in bogs and marshes; all year; 62	Steward & McWade	1961
	Ground pools still covered with snow and ice, taller, pitcher-shaped leaves exposed to the sun; ---; 62	Rempel	1953
	New leaves; all year, peak Aug.-Sept.; 323	Knutson	1943
	Only in *Sarracenia purpurea*; rare; 323	King et al.	1939
	Tamarack bogs, pitchers of *Sarracenia purpurea*, overwinter in pitcher plants; ---; 323	Ross	1947
	Leaves of plants, pitcher plants from a sphagnum bog; ---; 323	Dickinson	1944
	---; common in bog area; 323	Irwin	1943
	---; nocturnal 323	Dyar	1928
vanduzeei Dyar & Knab	Leaf bases of epiphytic Bromeliaceae; bite readily, rare, all year; 323[a]	King et al.	1939

TABLE 1 - MOSQUITOES (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
WYEOMYIA *duzeei* Dyar & Knab (cont.)	---; occasionally bite man; 323	Carpenter et al.	1946
	---; light traps; 323	Dow et al.	1964
	---; in woods; 323	King et al.	1960

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY MOSQUITOES

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
AEDES					
aegypti (Linnaeus)	Dengue & Yellow fever				323
cantator (Coquillett)	Equine encephalomyelitis				323
ANOPHELES					
albimanus Wiedemann		Malaria			323
barberi Coquillett		*Plasmodium vivax*			323
crucians Wiedemann		Malaria			323
freeborni Aitken		Malaria			323
maculipennis Meigen		Malaria			323
maculipennis freeborni Aitken		Malaria			62, 323
maculipennis occidentalis Dyar & Knab		Malaria			323
pseudopunctipennis franciscanus McCracken		Malaria			62, 323
pseudopunctipennis pseudopunctipennis Theobald		Malaria			323
punctipennis (Say)		Malaria			323
quadrimaculatus Say		Malaria			323

TABLE 2 - MOSQUITOES

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
CULEX					
nigripalpus Theobald	St. Louis encephalitis				323 (Dow et al., 1964)
pipiens Linnaeus	Western equine & St. Louis encephalitis				323
quinquefasciatus Say			Filariasis		323
	St. Louis encephalitis				323 (Chamberlain et al. 1954)
tarsalis Coquillett	Western equine encephalomyelitis				62
	Encephalitis				323
	Western equine encephalomyelitis				323 (Jenkins, 1950)
CULISETA *melanura* (Coquillett)	Eastern equine encephalitis				323

LITERATURE CITED

Aitken, T. H. C.
1940. The genus *Psorophora* in California (Diptera,Culicidae). Rev. Ent., Rio de J. 11(3):672-682.

Baker, R. H. & J. B. Kitzmiller
1963. Identification of certain Anophelines by means of salivary gland X-chromosomes. Proc. N. J. Mosq. Ext. Ass. 50:415-421.

Barber, M. A.
1939. Further observations (1938) on the *Anopheles* of New Mexico. Amer. J. trop. Med. 19(4):345-356.

Barnes, R. C., H. L Fellton & C. A. Wilson
1950. An annotated list of the mosquitoes of New York. Mosquito News. 10(2).69-84.

Bast, T. F.
1963. Chemical nat re of mosquito breeding waters. Proc. N. J. Mosq. Ext. Ass. 50:335-339.

Bates, M.
1949. The natural history of mosquitoes. Macmillan & Co., New York, N. Y. & London. 379 p.

Beadle, L. D.
1952. Eastern equine encephalitis in the United States. Mosquito News. 12(2):102-107.

Beyer, G. E.
1923. Mosquitoes of Louisiana. Louisiana State Board of Health. 30 p.

Bick, G. H.
1946. Collections of mosquitoes on Parris Island during 1945. J. econ. Ent. 39(1):89-91.

Bishopp. F. C., E. N. Cory & A. Stone
1933. Preliminary results of a mosquito survey in the Chesapeake Bay section. Proc. ent. Soc , Wash. 35(1):1-6.

Blickle, R. L.
1952. Notes on the mosquitoes (Culicinae) of New Hampshire. Proc. N. J. Mosq. Ext. Ass. 39:198-202.

Bonne, C. & J. Bonne-Wepster
1925. Mosquitoes of Surinam. A study on neotropical mosquitoes. Mede'. K. Inst. Trop. 21(3):558 p.

Boyd, .. F. ed.
1949. Malariology. A comprehensive survey of all aspects of this group of diseases from a global standpoint. W. B. Saunders Co., Philadelphia Pa. and London. 1343 p.

Breeland, S. G., W. E. Snow & E. Pickard
1961. Mosquitoes of the Tennessee Valley. J. Tenn. Acad. Sci. 36(4):249-319.

Breland, O. P.
1947. Notes on Pennsylvania mosquitoes. Mosquito News. 7(2):76-77.

Brown, A. W. A.
1951. Studies of the responses of the female *Aedes* mosquito Part IV. Field experiments on Canadian species. Bull. ent. Res. 42(3):575-582.

Brown, A. W. A., R. P. Thompson, C. R. Twinn L. K. Cutkomp
1951. Control of adult mosquitoes and black flies by DDT sprays applied from aircraft. Mosquito News. 11(2):75-84.

Carpenter, S. J.
1949. Collection of a fourth instar larva of *Anopheles albimanus* at Boca Raton Field in 1944. J. econ. Ent. 42(5):834 p.

_____.
1950. Notes on mosquitoes in North America: 1-New distribution records for eastern United States during 1946 and 1947. Mosquito News. 10(2):64-65.

_____.
1952. Notes on mosquitoes in North America: II. Collections at military installations in Indiana during 1944 and 1945. Mosquito News. 12(4):251-252.

_____. & R. W. Chamberlain
1946. Mosquito collections at army installations in the Fourth Service Command, 1943. J. econ. Ent. 39(1):82-88.

_____. & W. W. Middlekauff
1944. Inland records of salt marsh mosquitoes. J. econ. Ent. 37(1):108 p

_____., R. W. Chamberlain & T. F. Wanamaker
1945. New distribution records for the mosquitoes of the southeastern states in 1944. J. econ. Ent. 38(3):401-402.

_____., W. W. Middlekauff & R. W. Chamberlain
1946. The mosquitoes of the southern United States east of Oklahoma and Texas. Amer. Midl. Nat. Monogr. no. 3. 292 p.

Chamberlain, R. W., W. D. Sudia & R. H. Gogel
1964. Studies on transovarial transmission of St. Louis encephalitis virus by *Culex quinquefasciatus* Say. Amer. J. Hyg. 80(2):254-265.

_____.
1964a. Vector studies in the St. Louis encephalitis epidemic, Tampa Bay area, Florida, 1962. Amer. J. trop. Med. Hyg. 13(3):456-461.

Chapman, H. C.
1966. The mosquitoes of Nevada. U. S. Dept. of Agriculture, Entomology Research Division & The University of Nevada, College of Agriculture. 43 p.

Christensen. G. R. & F. C. Harmston
1944. A preliminary list of the mosquitoes of Indiana. J. econ. Ent. 37(1):110-111.

Darsie, R. F. Jr., D. MacCreary & L. A. Stearns
1951. An annotated list of the mosquitoes of Delaware. Proc. N. J. Mosq. Ext. Ass. pp. 137-146.

Dickinson, W. E.
1944. The mosquitoes of Wisconsin. Bull. publ. Mus. Milwaukee. 8(3):269-365.

Dodge, H. R.
1947. A new species of *Wyeomyia* from the pitcher plant (Diptera,Culicidae). Proc. ent. Soc., Wash. 49:117-122.

Dohanian, S. M.
1920. Mosquito control in a southern army camp. J. econ. Ent. 13(4):350-354.

Dorer, R. E., W. E. Bickley & H. P. Nicholson
1944. An annotated list of the mosquitoes of Virginia. Mosquito News. 4(2):48-49.

Dow, R. P., P. H. Coleman, K. E. Meadows & T. H. Work
1964. Isolation of St. Louis encephalitis viruses from mosquitoes in the Tampa Bay area of Florida during the epidemic of 1962. Amer. J. trop. Med. Hyg. 13(3):462-468.

Downe, A. E. R., N. L. Goring & A. S. West
1963. The influence of size and source of blood meals on rate of digestion of vertebrate serum proteins in mosquitoes (Diptera:Culicidae). J. Kans. ent. Soc. 36(4):200-206.

Dyar, H. G.
1907. Report on the mosquitoes of the coast region of California, with descriptions of new species. Proc. U. S. nat. Mus. 32(1516):121-129.

_____.
1918. New American mosquitoes (Diptera,Culicidae). Insec. Inscit. menst. 6(7-9):120-129.

_____.
1920. The mosquitoes of British Columbia and the Yukon Territory, Canada (Diptera, Culicidae). Insec. Inscit. menst. 7(1-3):1-27.

_____.
1921. The mosquitoes of Canada. Trans. roy. Soc. Can. 29(13):71-120.

_____.
1922. The mosquitoes of the United States. Proc. U. S. nat. Mus. 62(2447):1-119.

_____.
1923. The mosquitoes of the Yellowstone National Park (Diptera,Culicidae). Insec. Inscit. menst. 11(1-3):36-46.

_____.
1924. The mosquitoes of Colorado (Diptera,Culicidae). Insec. Inscit. menst. 12(1-3):39-46.

_____.
1928. The mosquitoes of the Americas. Pub. Carnegie instn. no. 387. 616 p.

_____.
1929. A new species of mosquito from Montana, with annotated list of the species known from the state. Proc. U. S. nat. Mus. 75(2794):1-8.

_____. & F. Knab
1917. New American mosquitoes (Diptera Culicidae). Insec. Inscit. menst. 5(10-12):165-169.

Edman, J. D.
1964. Control of *Culex tarsalis* (Coquillett) and *Aedes vexans* (Meigen) on Lewis and Clark Lake (Gavins Point Reservoir) by water level management. Mosquito News. 24(2):173-185.

_____. & A. E. R. Downe
1964. Host-blood sources and multiple-feeding habits of mosquitoes in Kansas. Mosquito News. 24(2):154-160.

Eyles, D. E. & H. Most
1947. Infectivity of Pacific Island *Wuchereria bancrofti* to mosquitoes of the United States. Amer. J. trop. Med. 27(2):211-220.

Felton, H. L., R. C. Barnes & C. A. Wilson
1950. New distribution records for the mosquitoes of New England. Mosquito News. 10(2):84-91.

Felt, E. P.
1904. Mosquitoes or Culicidae of New York State. Bull. N. Y. St. Mus. 79:241-400.

Ferrigno, F. & T. F. Bast
1962. Chemical mosquito control evaluations on salt-hay marshes. Proc. N. J. Mosq. Ext. Ass. 49:97-111.

Fisk, F. W.
1939. New mosquito records from Key West, Fla. J. econ. Ent. 32(3):469 p.

_____.
1941. *Deinocerites spanius* at Brownsville, Texas, with notes on its biology and a description of the larva. Ann. ent. Soc. Amer. 34(3):543-550.

Foote, R. H. & D. R. Cook
1959. Mosquitoes of medical importance. Agric. Handb. no. 152. 158 p.

Freeborn, S. B.
1917. The rice fields as a factor in the control of malaria. J. econ. Ent. 10(3):354-359.

_____.
1926. The mosquitoes of California. Univ. Calif. Publs Ent. 3(5):332-460.

_____. & R. M. Bohart
1951. The mosquitoes of California. Bull. Calif. Insect Surv. 1(2):25-78.

_____. & B. Brookman
1943. Identification guide to the mosquitoes of the Pacific coast states. Federal Security Agency, U. S. Public Health Service, Malaria Control in War Areas, Atlanta, Georgia. 23 p.

Frohne, W. C.
1954. Mosquito distribution in Alaska with special reference to a new type of life cycle. Mosquito News. 14(1):10-13.

_____.
1956. The biology of northern mosquitoes. Publ. Hlth Rep., Wash 71(6):616-621.

Geigy, R. & A. Herbig
1955. Erreger und Überträger tropischer Krankheiten. Acta trop., Basel. 472 p.

Gerhardt, R. W.
1966. South Dakota mosquitoes and their control. Bull. S. Dak. agric. Exp. Sta. no. 531. 82 p.

Gjullin, C. M. & H. F. Cross
1951. The effectiveness of seven insecticides against Alaskan mosquito larvae in different type of breeding areas. Proc. Pap. Am. Mosq. Control Ass. & Va. Mosq. Control Ass. pp. 75-76.

_____., R. I. Sailer, A. Stone & B. V. Travis
1961. The mosquitoes of Alaska. Agric. Handb. no. 182. 98 p.

Good, N. E.
1945. A list of the mosquitoes of the District of Columbia. Proc. ent Soc. Wash. 47(6):168-179.

Hammon, W. McD., D. M. Rees, J. Casals & G. Meiklejohn
1949. Experimental transmission of Japanese B encephalitis virus by *Culex tritaeniorhynchus* and *Culex pipiens* var. *pallens*, suspected natural vectors. Amer. J. Hyg. 50(1):46-50.

Harmston, F. C.
1949. An annotated list of mosquito records from Colorado. Gr. Basin Nat. 9(3-4):66-75.

Headlee, T. J.
1945. The mosquitoes of New Jersey and their control. Rutgers University Press, New Brunswick N. J. 326 p.

Hearle, E.
1921. Mosquito control investigations in British Columbia. Scient. Agric. 1(2):68-70.

_____.
1921a. The importance of mosquitoes, with notes on some British Columbia species. Proc. ent. Soc. B. C. nos. 13 & 15. 132-135 p.

_____.
1923. A new mosquito from British Columbia (Culicidae,Diptera). Canad. Ent. 55(1):4-5.

_____.
1926. The mosquitoes of the lower Fraser Valley, British Columbia and their control. Rep. natn. Res. Coun. Can. no. 17. 94 p.

_____.
1927. List of mosquitoes of British Columbia recorded to December 31, 1926. Proc. ent. Soc. B. C. no. 24. 11-19 p.

Herms, W. B.
1934. Mosquito control in California under the CWA. J. econ. Ent. 27(5):1014-1029.

Hinman, E. H.
1935. Biological notes on *Uranotaenia* spp. in Louisiana (Culicidae,Diptera). Ann. ent. Soc. Amer. 28(3):404-407.

Hopla, C. E.
1965. The feeding habits of Alaskan mosquitoes. Bull. Brooklyn ent. Soc. 59 & 60:88-127.

Horsfall, W. R.
1936. Occurrence and sequence of mosquitoes in southeastern Arkansas in 1935. J. econ. Ent. 29(4):676-679.

_____.
1942. Biology and control of mosquitoes in the rice area. Bull. Ark. agric. Exp. Sta. no. 427. 46 p.

Irwin, W. H.
1943. The mosquitoes of three selected areas in Cheboygan County, Michigan. Pap. Mich. Acad. Sci. 28(1942):379-396.

Jenkins, D. W.
1950. Bionomics of *Culex tarsalis* in relation to western equine encephalomyelitis. Amer. J. trop. Med. 30(6):909-916.

_____. & K. L. Knight
1950. Ecological survey of the mosquitoes of Great Whale River, Quebec. Proc. ent. Soc. Wash. 52(5):209-223.

Joyce, C. R.
1948. *Culex chidesteri* Dyar (Diptera,Culicidae) at Brownsville, Texas. Mosquito News. 8(3):102-105.

King, W. V., G. H. Bradley & T. E. McNeel
1939. The mosquitoes of the southeastern states. Misc. Publ. U. S. Dep. Agric. (revd.). no. 336. 98 p.

_____., _____., C. N. Smith & W. C. McDuffie
1960. A handbook of the mosquitoes of the southeastern United States. Agric. Handb. 173:188 p.

Knight, K. L.
1951. The *Aedes (Ochlerotatus) punctor* subgroup in North America. Ann. ent. Soc. Amer. 44(1):87-99.

Knutson, H.
1943. The status of the mosquitoes of the Great Swamp in Rhode Island during 1942. J. econ. Ent. 36(2):311-319.

Komr, W. H.
1923. A guide to the identification of the common mosquitoes of the southeastern United States. Publ. Hlth Rep., Wash. 38(20):1061-1080.

Lake, R. W.
1953. New mosquito distribution records for New Jersey. Proc. N. J. Mosq. Extern. Ass. 40:152-155.

Lane, J.
1953. Neotropical Culicidae. The University of Sao Paulo, Brazil. Vol. I:1-548. Vol. II:549-1112.

Lowry, P. R.
1929. Mosquitoes of New Hampshire. A preliminary report. Bull. N. H. agric. Exp. Stn. no. 243. 23 p.

Mail, G. A
1934. The mosquitoes of Montana. Bull. Mont. agric. Exp. Sta. no. 288. 72 p.

Manson-Bahr, Sir P.
1959. The story of *Filaria bancrofti*. A critical review. J. trop. Med. (Hyg.). 62(3):138-145.

Martini, E.
1930. Culicidae. *In*: Lindner. Die Fliegen der palaearktischen Region. E. Schweizerbart, Stuttgart. 11 & 12:145-320.

Matheson, R.
1933. A new species of mosquito from Colorado (Diptera,Culicidae). Proc. ent. Soc. Wash. 35(5):69-71.

_____.
1944. Handbook of the mosquitoes of North America. Comstock Publ. Co , Ithaca, N. Y. 314 p.

McGregor, T. & R. B. Eads
1943. Mosquitoes of Texas. J. econ. Ent. 36(6):938-940.

McLintock, J.
1944. The mosquitoes of the Greater Winnipeg area. Canad. Ent. 76(5):89-104.

Menzies, G. C., R. B. Eads & F. C. Harmston
1955. The discovery of *Culex erythrothorax* Dyar in Texas. Mosquito News. 15(4):235-236.

Monchadskii, A. S.
1936. Les Larves des Moustiques (Fam. Culicidae) de l'URSS et des pays limitrophes. Tabl. anal. Faune URSS. no. 24. 383 p.

Natvig, L. R.
1948. Contributions to the knowledge of the Danish and Pennoscandian mosquitoes. Culicini. Norsk ent. Tidsskr. Suppl. I. 567 p.

Olson, T. A. & H. L. Keegan
1944. The mosquito collecting program of the Seventh Service Command for 1942-1943. J. econ. Ent. 37(6):780-785.

Owen, W. B.
1937. The mosquitoes of Minnesota, with special reference to their biologies. Tech. Bull. Minn. agric. Exp. Sta. no. 126. 75 p.

Parker, J. R.
1916. Notes on the more common mosquitoes of Montana. 14th Rep. St. Ent. Mont., Bull. Mont. agric. Exp. Sta. 112:69-75.

Peyton, E. L., J. F. Reinert & N. E. Peterson
1964. The occurrence of *Deinocerites pseudes* Dyar and Knab in the United States, with additional notes on the biology of *Deinocerites* species of Texas. Mosquito News. 24(4):449-458.

Pratt, H. D.
1952. Notes on *Anopheles earlei* and other American species of the *Anopheles maculipennis* complex. Amer. J. trop. Med. Hyg 1(3):484-493.

_____. & E. L. Seabrook
1952. The occurrence of *Culex iolambdis* Dyar in Florida and Puerto Rico, with a description of the larva. Proc. ent. Soc. Wash. 54(1):27-32.

Pritchard, A. E., E. L. Seabrook & J. A. Mulrennan
1947. The mosquitoes of the Florida Keys. Florida Ent. 30:8-15.

Quinby, G. E.
1941. Additions to the mosquitoes (Culicidae) of the Reelfoot Lake Region. J. Tenn. Acad. Sci. 16(1):17-21.

Rees, D. M.
1934. Mosquito records from Utah. Pan.-Pacif. Ent. 10(4):161-165.

_____.
1943. The mosquitoes of Utah. Bull. Univ. Utah. 33(7):99 p.

_____. & L. T. Nielsen
1951 Four new mosquito records from Utah (Diptera:Culicidae). Pan-Pacif. Ent. 27(1):11-12.

Rempel, J. G.
1950. A guide to the mosquito larvae of western Canada. Canad. J. Res. 28(4):207-248.

_____.
1953. The mosquitoes of Saskatchewan. Can. J. Zool. 31(4):433-509.

Root, F. M.
1922. The larvae of American *Anopheles* mosquitoes, in relation to classification and identification. Amer. J. Hyg. 2(4):379-393.

Ross, H. H.
1947. The mosquitoes of Illinois (Diptera,Culicidae). Bull. Ill. nat. Hist. Surv. 24(1):96 p.

Rowe, J. A.
1942. Preliminary report on Iowa mosquitoes. Iowa St. Coll. J. Sci. 16(2):211-225.

Rozeboom, L. E.
1942. The mosquitoes of Oklahoma. Tech. Bull. Okla. agric. Exp. Sta. no. 16. 56 p.

_____.
1951. *Anopheles (A.) earlei* Vargas, 1943, in Montana: Identity and adaptation to laboratory conditions (Diptera:Culicidae). Amer. J. trop. Med. Hyg. 1(3):477-483.

Reuger, M. E., M. T. Druce & S. Druce
1950. New mosquito distribution records for Texas. Mosquito News. 10(2):60-63.

Sabrosky, C. W.
1946. Occurrence of malaria mosquitoes in southern Michigan. Tech. Bull. Mich. agric. Exp. Sta. no. 202. 50 p.

Schwardt, H. H.
1939. Biologies of Arkansas rice field mosquitoes. Bull. Arkansas agric. Exp. Sta. no. 377. 22 p.

Seabrook, E. L.
1951. Mosquito control problems in Florida. Proc. Pap. Am. Mosq. Control Ass. & Va. Mosq. Control Ass. pp. 17-19.

Séguy, E.
1924. Les Moustiques de l'Afrique Mineure, de l'Egypte et de la Syrie. Paul Lechevalier, Paris. 257 p.

Shemanchuk, J. A.
1959. Mosquitoes (Diptera:Culicidae) in irrigated areas of southern Alberta and their seasonal changes in abundance and distribution. Canad. J. Zool. 37(6):899-912.

Shields, S. E.
1938. Tennessee Valley mosquito collections. J. econ. Ent. 31(3):426-430.

Shtakelberg, A. A.
1925. Materials for the identification of blood-sucking diptera of U.S.S.R., I. Genus *Anopheles*. Rev. Microbiol., Saratov. 4(2):20-42. (Abstract used).

Smith, M. E.
1952. A new northern *Aedes* mosquito, with notes on its close ally, *Aedes dienteus* H. D. & K. (Diptera:Culicidae). Bull. Brooklyn ent. Soc. 47(1):19-28.

Sommerman, K. M.
1964. Notes on activities of Alaskan *Culiseta* adults (Diptera:Culicidae). Mosquito News. 24(1):60-64.

Stage, H. H. & J. C. Chamberlin
1945. Abundance and flight habits of certain Alaskan mosquitoes, as determined by means of a rotary-type trap. Mosquito News. 5(1):8-16.

Stage, H. H., C. M. Gjullin & W. W. Yates
1952. Mosquitoes of the northwestern states. Agric. Handb. 46:95 p.

Stearns, L. A., D. MacCreary & N. P. Newhouse
1933. The problem of mosquito control in Delaware. Bull. Del. Univ. agric. Exp. Stn. no. 181. 5-106 p.

Steward, C. C. & J. W. McWade
1961. The mosquitoes of Ontario (Diptera:Culicidae) with keys to the species and notes on distribution. Proc. ent. Soc. Ont. 91:121-188.

Stone, A.
1961. A synoptic catalog of the mosquitoes of the world, supplement I (Diptera: Culicidae). Proc. ent. Soc. Wash. 63(1):29-52.

_____.
1965. Family Culicidae. pp. 105-120. *In:* A catalog of the diptera of America north of Mexico. Agricultural Research Service, United States Dept. of Agriculture. 1696 p.

_____., K. L. Knight & H. Starcke
1959. A synoptic catalog of the mosquitoes of the world (Diptera,Culicidae). The Thomas Say Foundation, Ent. Soc. Amer. 6:358 p.

Sudia, W. D. & R. W. Chamberlain
1964 Experimental infection of *Culex nigripalpus* Theobald with the virus of St. Louis encephalitis. Amer. J. trop. Med. Hyg. 13(3):469-471.

Tate, H. D. & D. B. Gates
1944. The mosquitoes of Nebraska. Res. Bull. Neb. agric. Exp. Sta. no. 133. 27 p.

Thurman, E. B., J. S. Haeger & J. A. Mulrennan
1951. The taxonomy and biology of *Psorophora (Janthinosoma) johnstonii* (Grabham, 1905), (Diptera:Culicidae). Ann. ent. Soc. Amer. 44(1):144-157.

Tinker, M. E.
1964. Larval habitat of *Aedes aegypti* (L.) in the United States. Mosquito News. 24(4):426-432.

Tulloch, G. S.
1934. Mosquito investigations in Alaska. Psyche. 41(4):201-210.

Twinn, C. R.
1926. Notes on the mosquitoes of the Ottawa District. Canad. Ent. 58(5):108-111.

_____.
1926a. Notes on the mosquito fauna of Quebec. Rep. Quebec Soc. Prot. Pl. 18:84-92.

_____.
1944. Report on the 1944 Anopheline mosquito survey in Canada. Process. Publ. Div. Ent. Can. no. 17. 52 p.

_____.
1949. Mosquitoes and mosquito control in Canada. Mosquito News. 9(2):35-41.

_____., B. Hocking, W. C. McDuffie & H. F. Cross
1948. A preliminary account of the biting flies at Churchill, Manitoba. Canad. J. Res. (D). 26(6):334-357.

Vargas, L.
1939. Patos acerca del *An. pseudopunctipennis* y de un *Anopheles* neuvo de California. Medicina, Mèx. 19(347):356-362.

Vargas, L.
1950. Malaria along the Mexico-United States border. Bull. World Hlth Org. 2:611-620.

Wallis, C. R.
1960. Mosquitoes in Connecticut. Bull. Conn. agric. Exp. Sta. 632:30.

Weber, N. A.
1950. A survey of the insects and related arthropods of Arctic Alaska. Part I. Trans. Amer. ent. Soc. 76(3):147-206.

Weidhass, J. A. Jr.
1952. A first record of *Aedes diantaeus* H. D. & K. for Massachusetts with notes on associated species. Mosquito News. 12(1):8-9.

Wilson, C. A., R. C. Barnes & H. L. Fellton
1946. A list of the mosquitoes of Pennsylvania with notes on the distribution and abundance. Mosquito News. 6(2):78-84.

Winn, A. F. & G. Beaulieu
1915. A preliminary list of the insects of the provinces of Quebec. Part II-Diptera. Rep. Quebec Soc. Prot. Pl. 7:108-159.

_____. & _____.
1932. A preliminary list of the insects of the province of Quebec. Part II-Diptera. Rep. Quebec Soc. Prot. Pl. 24:100 p.

Wirth, W. W.
1947. Notes on the mosquitoes of Louisiana. J. econ. Ent. 40(5):742-744.

B. BLACK FLIES

The black fly entries constitute a large number of species, with documentation of their biology. No disease transmission was recorded. In the table are listed 234 species or subspecies.

TABLE 1 - BLACK FLIES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CNEPHIA *abdita* Peterson	Small stream; May-June; 62	Davies et al.	1962
	---; ---; 62, 323 (Temporary rivulet and pools close to a spring source on the undersides of grass blades, in curled-up leaves, or crevices in leaf stems, often in very slow current, Apr.-May)	Stone	1965
borealis (Malloch)	---; Aug.; 5	Jenkins	1948
	---; ---; 62	Hocking & Pickering	1954
dacotensis (Dyar & Shannon)	Outlet stream; stones and moss; 62	Wolfe & Peterson	1959
	Mainly in streams and near outlets of lakes; April-June; 62	Davies et al.	1962
	Rivers; rare; 62	Fredeen	1958
	---; active in the morning and evening; 62	Wolfe & Peterson	1960
	---; active July-Aug.; 62	Hocking & Richards	1952
	---; ---; 62, 323 (Occurs in enormous numbers, usually in out-flow streams from lakes and ponds, April-May)	Stone	1964
	Warm pond, lake outlets, surface of water; stones and vegetation above water, April-June; 323	Stone & Jamnback	1955
devaria Davies, Peterson & Wood	Small shallow, muddy bottomed drainage stream; May; 62	Davies et al.	1962
emergens Stone	Upland, semi-upland and lowland streams, attached to rocks, stones, sticks and vegetations; May-Aug.; 5	Sommerman et al.	1955
	Streams; ---; 62	Peterson & Wolfe	1958
	---; ---; 323	Stone	1965
erebites Shewell	Lowland streams, among vegetation, on bark and sticks; May-July; 5	Sommerman et al.	1955

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CNEPHIA *eremites* Shewell (cont.)	Small stream draining the end of a shallow lake with over-hanging banks of carex marsh and a bed of fine gravel, attached to rocks and twigs; among dwarf bushes and other herbage by the stream banks, June-Aug.; 62	Shewell	1952
freytagi DeFoliart & Peterson	---; ---; 323	Stone	1965
invenusta (Walker)	Swift flowing, permanent streams, attached to the trailing moss in stream; May-June; 62	Wolfe & Peterson	1959
	Along the river shores; early spring; 62	Peterson & Wolfe	1958
	---; ---; 62, 323 (Among moss on rocks in swiftly flowing water, unbroken waters of permanent streams at a depth of one to four feet, emerge in the early spring)	Stone	1964
jeanae DeFoliart & Peterson	---; ---; 323	Stone	1965
loisae Stone & Jamnback	Streams with sandy bottom and large rocks; March-May; 323	Stone & Jamnback	1955
minus (Dyar & Shannon)	Lowland lake-outlet stream, on vegetation and sticks; June; 5	Sommerman et al.	1955
	---; ---; 323	Stone	1965
mutata (Malloch)	---; bog area near sea level, area shaded from direct sunlight, July; 5	Jenkins	1948
	---; ---; 5, 62, 323 (Common in small temporary or permanent forest streams attached to small stones, sticks and occasionally trailing grasses, attracted to man, although it rarely bites, Apr.-May)	Stone	1964
	Small stones and pebbles in shallow waters of forest streams, seepages, small permanent streams; border vegetation, May-Aug.; 62	Wolfe & Peterson	195[illegible]
	---; active in the morning and in the evening; 62	Wolfe & Peterson	1960
	Numerous in streams with sandy bottoms with few rocks and pebbles, abundant trailing grass; rocks, grass on stream edges. March, May-June, Nov.-Dec.; 323	Stone & Jamnback	1955

TABLE 1 BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
Simulium			
ornithophilia Davies, Peterson & Wood	---; ---; 62	Stone	1965
osborni (Stains & Knowlton)	---; ---; 323	Stone	1965
pallipes (Fries)	Mountain and bog drainage streams with rocky bottoms at 3,000 feet elevation; Aug.; 5	Jenkins	1948
pecuarum (Riley)	---; ---; 323° (Small streams and in the vicinity of larger rivers, on floating vegetation, on rocks, under water and streambed, attached to sticks or green vegetation)	Stone	1964
	---; ---; 323	Stone	1965
salleri Stone	Semi-upland and lowland stream, submerged branches, wood and trailing vegetation; May-Sept.; 5	Sommerman et al.	1955
	Lake outlet; ---; 5, 62, 323	Stone	1952
	Streams and rivers; very rare; 62	Fredeen	1958
	---; June and July; 62	Hocking & Pickering	1954
saskatchewana Shewell & Fredeen	Emergent vegetation in swift streams; May and July; 62	Shewell &	
sommermanae Stone	Upland, small, cold streams abundant with rocks and trailing vegetation; May-Sept.; 5	Sommerman et al.	1955
	---; ---; 62	Hocking & Pickering	1954
stewarti Coleman	---; ---; 323	Stone	1965
subzetsm (Edwards)	---; ---; 62	Davies	1952
tarantatifrons (Enderlein)	Streams and rivers; rare; 62	Fredeen	1958
	---; June; 62	Hocking & Pickering	1954
	---; ---; 323	Stone	1965
villosa DeFoliart & Peterson	---; ---; 323	Stone	1965

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CNETHA			
taeniatifrons Enderlein	---; ---; 323	Enderlein	1925
EUSIMULIUM			
aureum Fries	Lake outlets, marsh and bog drainage streams with bottoms of sticks, wood and rock, outlet of beaver dam; about 2500 feet elevation, July-Aug.; 5	Jenkins	1948
	Small, shallow permanent streams; ---; 62	Hearle	1932
	---; July-Aug.; 62	Twinn et al.	1948
	---; May, June, Aug.; 323	Stains & Knowlton	1943
aureum bracteatum Coquillett	---; May; 62	Winn & Beaulieu	1932
	---; ---; 323	Dyar & Shannon	1927
baffineness (Twinn)	Head waters of creeks; locally common, July; 62	Hocking & Pickering	1954
baffinense pallens Twinn	Common in small streams and rapids of creeks; July; 62	Twinn et al.	1948
boreale (Malloch)	Small, slow-flowing streams with rocks; ---; 62	Hearle	1932
	---; July; 323	Stains & Knowlton	1943
canonicolum Dyar & Shannon	---; ---; 323	Dyar & Shannon	1927
clarum Dyar & Shannon	Small to moderate, swift, shallow streams with stony ripples; pupae often attached to submerged trailing grass; 62	Hearle	1932
	---; March, June, July; 323	Stains & Knowlton	1943
congareeanum Dyar & Shannon	---; ---; 323	Dyar & Shannon	1927
costatum Friederichs	Small streams; ---; 62	Hocking	1950
croxtoni Nicholson & Mickel	Cage trap by the stream; May-June; 62	Shewell	1952
	Bog streams; ---; 62	Hocking & Richards	1952

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
EUSIMULIUM *dacotense* Dyar & Shannon	Permanent and temporary streams; protruding rocks in stream and on banks, May; 323	Nicholson	1945
	---; June; 323	Stains & Knowlton	1943
euryadminiculum Davies	---; ---; 62	Graham	1965
frisoni Dyar & Shannon	---; ---; 323	Dyar & Shannon	1927
furculatum Shewell	---; July; 5. River and lake; June-Aug.; 62	Shewell	1952
	Forest streams; ---; 62	Hocking & Pickering	1954
innocens Shewell	On grass blades trailing the current beneath the water surface; cage trap, May-June; 62	Shewell	1952
johannseni (Hart)	---; ---; 62, 323	Dyar & Shannon	1927
lascivum Twinn	---; ---; 323	Nicholson	1945
latipes (Meigen)	Small shallow streams; common on woods, rocks and occasionally on vegetation, lower elevations from sea level to about 1,000 feet, June-Aug.; 5	Jenkins	1948
	Shallow, stony grassy streams; ---; 62	Twinn et al.	1948
	---; June-Aug.; 62	Hocking & Richards	1952
minus Dyar & Shannon	---; ---; 5, 323	Dyar & Shannon	1927
	Shallow, sluggish streams, on vegetation; ---; 62	Hearle	1932
mutatum Malloch	---; May-July; 62	Winn & Beaulieu	1932
	---; ---; 323	Dyar & Shannon	1927
mutatum *permutatum* Dyar & Shannon	---; ---; 5	Dyar & Shannon	1927
	---; brush plateau at 4000 feet elevation; 62	Hearle	1932
	---; July, 323	Stains & Knowlton	1943

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
EUSIMULIUM			
obtusum Dyar & Shannon	---; ---; 323	Dyar & Shannon	1927
osborni Stains & Knowlton	---; June; 323	Stains & Knowlton	1943
pecuarum (Riley)	---; ---; 62, 323°	Dyar & Shannon	1927
	---; Jan.; 323	Stains & Knowlton	1943
pilosum Knowlton & Rowe	---; ---; 323	Knowlton & Rowe	1934
pugetense Dyar & Shannon	Cold mountain streams, bases of waterfalls and cold bog drainage streams composed of rocks and slabs of schist and gneiss; at altitudes from near sea level to about 3,000 feet elevation, May-Aug.; 5	Jenkins	1948
	---; ---; 62	Hocking & Pickering	1954
	---; ---; 323	Dyar & Shannon	1927
quadratus Stains & Knowlton	---; June; 323	Stains & Knowlton	1943
subexcisum (Edwards)	---; July; 62 (Small rapids and rapids of creeks)	Twinn et al.	1948
	---; rare, June; 62	Hocking & Pickering	1954
utchense Knowlton & Rowe	---; ---; 323	Knowlton & Rowe	1934
GYMNOPAIS			
dichopticus Stone	Cold, fast upland streams, underside of loose stones; June-Sept.; 5	Sommerman et al.	1955
	---; ---; 62	Stone	1965
holopticus Stone	Underside of loose stones in cold, fast upland streams; June-Sept.; 5	Sommerman et al.	1955
	Spring-fed streams; ---; 62	Peterson & Wolfe	1958

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
GYMNOPAIS			
nova (Dyar & Shannon)	---; ---; 62, 323	Stone	1965
tibblesi Stone & Jamnback	---; ---; 62, 323	Stone	1965
PARASIMULIUM			
furcatum Malloch	---; ---; 323	Stone	1965
PROSIMULIUM			
alpestre Dorogostajskij, Rubzov & Vlasenko	Upland and semi-upland streams in submerged branches, sticks, poles and those resisting the current, also attached to stones; May-Sept.; 5	Sommerman et al.	1955
	---; ---; 62	Stone	1965
browni (Twinn)	---; June-Aug.; 62	Hocking & Richards	1952
caudatum Shewell	---; ---; 62, 323	Stone	1965
daviesi Peterson & DeFoliart	---; ---; 323	Stone	1965
decemarticulatum (Twinn)	---; stream; 5	Stone	1952
	---; ---; 5, 62, 323 (Temporary lowland streams, bog seeps, forest-drainage creeks and young streams associated with swampy forest areas, early spring species)	Stone	1964
	Cage trap in the stream; May; 62	Shewell	1952
	Creek; [illegible]; 62	Hocking & Pickering	1954
dicentum Dyar & Shannon	---; May, July; 323	Stains & Knowlton	1943
dicum Dyar & Shannon	---; ---; 5, 62, 323	Dyar & Shannon	1927
doveri Sommerman	---; ---; 5	Stone	1965
esselbaughi Sommerman	Clear, cold permanent spring-fed forest streams, a[illegible]ched to rocks surfaces, under loose stones, i[illegible]ffles or to large roots in the falls; attracted to man, active throughout the twilight hours and lasted through the night, May-Sept., peak June; 5°	Sommerman	1964

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PROSIMULIUM			
exigens Dyar & Shannon	---; ---; 62, 323	Stone	1965
exigum Dyar & Shannon	---; May, July; 323	Stains & Knowlton	1943
flaviantenum (Stains & Knowlton)	---; May, June, July; 323	Stains & Knowlton	1943
fontanum Syme & Davies	Cool, small spring-fed and bog-fed streams, on rocks and vegetation and in the sand at the bottom of small pools; Apr.-June; 62°	Davies & Syme	1958
	---; June-Aug.; 62	Stone	1964
formosum Shewell	---; ---; 62	Stone	1965
frohnei Sommerman	---; ---; 5	Stone	1965
fulvithorax Shewell	-; ---; 62	Stone	1965
fulvum (Coquillett)	Clear, tumbling upland streams, attached to moss-covered rocks; May-Sept.; 5	Sommerman et al.	1955
	---; common along coast from sea level to altitudes of 3,000 or more feet, active early in the morning and late in the evening, June-Aug.; 5	Jenkins	1948
	---; ---; 5, 62, 323 (Common in mountain regions, bites man)	Dyar & Shannon	1927
	Spring-fed streams; early spring; 62°	Peterson & Wolfe	1958
	---; common at elevations of from 4000 to 5000 feet; 62	Hearle	1932
	---; July, Sept.; 323	Stains & Knowlton	1943
fuscum Syme & Davies	Larger streams of swifter current, creeks of moderate flow, on rocks and vegetations; April-Nov.; 62°	Davies & Syme	1958
	---; ---; 62, 323 (Early spring species, prefer rapid streams, bites man)	Stone	1964

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PROSIMULIUM gibsoni (Twinn)	Clear, shallow, often temporary streams, submerged trailing grass and reeds; April-May; 62	Davies et al.	1962
	---; common, June; 62	Hocking & Pickering	1954
	---; ---; 62, 323 (Clear temporary drainage streams, attached to rocks and trailing grasses, April-May)	Stone	1964
hirtipes (Fries)	Cold, fast mountain streams and cold bog streams from near sea level to elevations of 4,000 feet, lower side of rocks and wood, bites all hours of the day but most numerous in the evening, in buildings and open areas; 5°	Jenkins	1948
	Deflecting surfaces and underside of loose stones, trailing branches, leaves, vegetation and submerged wood; May-Sept., peak June; 5	Sommerman et al.	1955
	Creek, river drainage basin, lake-outlet, streams, on stony with low border vegetation and trailing grasses, logs on dams; low shrubs, in caves near stones or ground level, on treetops by night, attracted to light, active in the morning and evening; 62°	Wolfe & Peterson	1960
	Swiftly flowing water close to banks, watercourses, small shallow waterways with cascades, rapids and rock bed; small cascades and waterfalls, May-July; 62	Wolfe & Peterson	1959
	All types of streams, infant spring-fed, young and adolescent streams; common in spring; 62	Peterson & Wolfe	1958
	---; Aug.; 62	Hocking & Richards	1952
	Fall in streams, partially exposed fine roots moistened by spray from water flowing over a dam; abundant, warm climate, April-July, Oct.-Dec., peak May; 323°	Stone & Jamnback	1955
	---; March; 323	Dyar & Shannon	1927
longilobum Peterson & DePoliart	---; ---; 323	Stone	1965

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PROSIMULIUM *magnum* Dyar & Shannon	On rocks, wood or other objects in the stream; April, May; 62	Davies et al.	1962
	Temporary streams; Mar.; 62°. ---; April-July; 323°	Stone	1964
	On leaf or stone in swift stream; ---; 323	Dyar & Shannon	1927
	Stream; lowlands; 323	Stone & Jamnback	1955
mixtum Syme & Davies	Slow, current streams, creeks, on rocks and vegetations; March-Nov.; 62°	Davies & Syme	1958
	---; ---; 62, 323	Stone	1965
	Small streams or creeks with moderate flow; ---; 323°	Stone	1964
multidentatum (Twinn)	Swift flowing waters above falls; June; 62	Wolfe & Peterson	1959
	Cage trap in the stream; ---; 62	Shewell	1952
	Rivers; ---; 62	Peterson & Wolfe	1958
	---; Apr.-May; 62, 323	Stone	1964
mutatum Malloch	---; ---; 5, 62, 323	Malloch	1914
novum Dyar & Shannon	Fast cold streams under sides of rocks; at an elevation of 3,000 feet, July-Aug.; 5	Jenkins	1948
	---; ---; 62°	Hearle	1932
	---; ---; 62, 323	Dyar & Shannon	1927
onychadactylum Dyar & Shannon	Trailing grass stems and submerged sticks, rocks and branches, attached to sandy and pebbly cases to logs or loose stones; May-Sept.; 5	Sommerman et al.	1955
	Clear mountain and bog drainage streams and waterfalls at elevations from near sea level to 1,000 feet, on rocks and gravel; ---; 5	Jenkins	1948
	---; ---; 62	Hocking	1950
	---; ---; 323	Stone	1965

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PROSIMULIUM *pancerastes* Dyar & Shannon	---; ---; 5, 62	Dyar & Shannon	1927
	---; April; 323	Stains & Knowlton	1943
pecuarum Riley	---; ---; 323	Malloch	1914
perspicuum Sommerman	---; ---; 5	Stone	1965
pleurale Malloch	Fast, clear mountain streams and bog drainage streams with bottoms composed of rocks and boulders at altitudes of 800 and 2,000 feet; attracted to man; 5	Jenkins	1948
	Submerged or trailing branches; May-Sept.; 5	Sommerman et al.	1955
	---; June; 62	Wolfe & Peterson	1959
	---; April; 323	Stains & Knowlton	1943
rhizophorum Stone & Jamnback	Small, temporary, rapid streams in forested areas; April-May; 323	Stone & Jamnback	1955
saltus Stone & Jamnback	Foot of small temporary cascade falling off shale cliff, small stones in stream; April, May; 323	Stone & Jamnback	1955
shewelli Peterson & DeFoliart	---; ---; 323	Stone	1965
tenuical Enderlein	---; ---; 323	Enderlein	1925
travisi Stone	Shallow streams; June-Sept.; 5	Sommerman et al.	1955
	---; ---; 62, 323	Stone	1965
uinta Peterson & DeFoliart	---; ---; 323	Stone	1965
unicum (Twinn)	---; ---; 323	Stone	1965
ursinum (Edwards)	Upland tumbling streams, attached to stones; June-Sept.; 5	Sommerman et al.	1955
	---; ---; 62	Stone	1965

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PROSIMULIUM *vernale* Shewell	Small shallow stream draining an extensive swamp and wooded areas, in stream debris; May; 62	Shewell	1952
SCHOENBAUERIA *furculata* Wolfe & Peterson	---, July; 62	Wolfe & Peterson	1959
SIMULIUM *aestivum* Davies, Peterson & Wood	Small, clear, cool stenothermal streams, which usually arise from a bog or spring source and pass through moderately dense woods; June; 62	Davies et al.	1962
aldrichianum Enderlein	---; ---; 323	Vargas	1945
arcticum Malloch	Semi-upland and lowland streams, submerged branches, vegetation and the underside of loose stone; May-Sept.; 5	Sommerman et al.	1955
	Streams, lake outlet, bog drainage stream in coastal areas below 500 feet elevation, rocks and on wood; at an elevation of 4,000 feet; 5	Jenkins	1948
	---; lake shore, most active at noon; 5°	Weber	1950
	Vegetation and rocks in large fast-flowing tributaries of the river, rarely in irrigation canals; June-Sept.; 62°	Fredeen & Shemanchuk	1960
	Large rivers at points where rocks and boulders form shallow ripples, small permanent streams; ---; 62	Hearle	1932
	---; April; 62	Fredeen	1964
	---; ---; 126	Smart	1944
	---; abundant by the river, Sept.; 323	Peterson	1960
argus Williston	---; ---; 62	Stone	1965
	Small, spring-fed stream of moderate flow; ---; 323	Stone & Boreham	1965
asakakae Smart	---; ---; 126	Smart	1944
aureum Fries	Lowland streams, in submerged vegetation, bark, sticks and stems; July-Sept.; 5	Sommerman et al.	1955
	Small drainage, supply ditches, among pebbles and grass leaves in slow-flowing water; July-Sept.; 62°	Fredeen & Shemanchuk	1960

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM aureum Fries	Adolescent streams, mature and old rivers; spring and autumn; 62	Peterson & Wolfe	1958
	Emergent vegetation in swift streams; ---; 62	Shewell & Fredeen	1958
	Warm, slow-moving lake outlets; ---; 62. Trailing grass or leaves, warm meadow streams, lake outlets; April-Aug.; 323	Stone & Jamnback	1955
	---; forest, rare, June, 62. ---; ---; 351	Wolfe & Peterson	1959
	Small, spring-fed streams of moderate flow; ---; 323	Stone & Boreham	1965
baffinense Twinn	Slow, lowland streams, among trailing vegetation and leaves; July-Sept.;	Sommerman et al.	1955
	Streams, creeks; June; 62	Davies et al.	1962
	---; ---; 323	Stone	1965
beameri Stains & Knowlton	---; July; 323	Stains & Knowlton	1943
bicornis Dorogostajskij, Rubzov & Vlasenko	A wide variety of streams, among stones and trailing grass; June-Sept.;	Sommerman et al.	1955
	---; ---; 62, 323	Stone	1965
bivittatum Malloch	Rivers and large irrigation canals, on debris and branches of willows dipping into fast-flowing water, on grasses and other aquatic vegetation; June-Sept.; 62°	Fredeen & Shemanchuk	1960
	---; ---; 62, 323	Stone	1965
boreale (Malloch)	---; ---; 323	Vargas	1945
bracteatum Coquillett	---; July and Aug., 62	Walker	1927
	Small streams; June-Oct.; 323	Jobbins-Pomeroy	1916
	---; house windows; 323	Forbes	1912
brevicercum Knowlton & Rowe	---; ---; 323	Knowlton & Rowe	1934

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
brouni Twinn	Stream; ---; 62	Twinn	1936
canadense Hearle	---; ---, 62	Vargas	1945
	---, April; 323	Stains & Knowlton	1943
canonicola (Dyar & Shannon)	---, ---; 62, 323	Stone	1965
canonicolum (Dyar & Shannon)	Rivers; rare; 62	Fredeen	1958
	Emergent vegetation in swift streams; ---; 62	Shewell & Fredeen	1958
clarum Dyar & Shannon	---; ---; 62, 323	Vargas	1945
congareenarum Dyar & Shannon	---; May-July; 62	Davies et al.	1962
	Attached to vegetation in slow-flowing permanent streams; Mar.-June; 323	Stone	1964
corbis Twinn	Lowland lake-outlet and semi-upland streams, submerged wood and underside of loose stones; May-Sept.; 5°	Sommerman et al.	1955
	Bog and marsh drainage streams in level and mountainous country along coast up to an elevation of 2,000 feet; ---; 5	Jenkins	1948
	Attached to rock faces and stones in and below cascades and waterfalls, backwaters beneath waterfall; border vegetation and water above waterfalls, June; 62°	Wolfe & Peterson	1959
	Fast running river with stony bottom, on submerged stems of dogwood; ---; 62	Twinn	1936
	---; spring; 62	Peterson & Wolfe	1958
	---; July & Aug.; 62	Hocking & Richards	1952
	Stems of dogwood close to the bank of a river in rapids below a waterfall, cold streams; rare, May-June; 323	Stone & Jamnback	1955

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *costarum* Friedericks	---; active June and July; 62	Davies	1952
	---; ---; 323	Goulding & Deonier	1956
croxtoni Nicholson & Mickel	Temporary and permanent streams; May-July, 62	Davies et al.	1962
	Temporary and young streams; June-July; 323	Stone	1964
dacotense Dyar & Shannon	---; ---; 323	Vargas	1945
damnosum Theobald	---; ---; 323	Wu	1931
decemarticulatum Twinn	Shallow, temporary streams with rock bottom. drainage ditch; ---; 62	Twinn	1936
decorum Walker	Under surfaces of stones exposed to direct sunshine. also in deflecting surfaces and trailing vegetation in partially shaded areas; July-Sept.; 5°	Sommerman et al.	1955
	Lake outlets and bog drainage streams at elevations below 1,000 feet, at the base of small waterfalls, at the end of culverts on rocks; June; 5	Jenkins	1948
	---; ---; 5, 62. 323 (Outflows from naturally and artificially impounded waters, occur in immense numbers on dam faces and on the sticks of beaver dams)	Stone	1964
	Irrigation drop structures, head gates, rocks and on vegetation down stream, canals and drainage; peak Sept.; 62°	Fredeen & Shemanchuk	1960
	Lake side faces of sluice-gate boards of dams at lake outlets on dams; ---; 62	Wolfe & Peterson	1959
	Rivers; common, Apr.-Aug.; 62	Fredeen	1964
	On dams, at lake outlets, below large pools; common, May-Oct.; 323°	Stone & Jamback	1955
decorum *kennei* Dyar & Shannon	---; ---; 5	Dyar & Shannon	1932
	Small permanent stream with rocky ripples, flowing through well wooded gorge; ---; 62	Hearle	1932
	---; experimental transmission of *Bacterium tularense*; 323	Parker	1934

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
defoliarti Stone & Peterson	---; ---; 62, 323	Stone	1965
dicentum Dyar & Shannon	---; ---; 62, 323	Vargas	1945
dixon Dyar & Shannon	---; ---; 5, 62	Vargas	1945
distinctum Malloch	---; ---; 323	Malloch	1914
emarginatum Davies, Peterson & Wood	Creek, micro-bays of the stream; May-June; 62	Davies et al.	1962
encisoi Vargas & Diaz Najera	Small, spring-fed stream with moderate flow; ---; 323	Stone & Borehan	1965
eurycaniculum Davies	Stones in clear, shallow rill below dam; vegetation bordering stream, May-June; 62	Wolfe & Peterson	1959
	Creek; ---; 62	Davies	1949
	---; ---; 323	Stone	1965
excisum Davies, Peterson & Wood	---; ---; 62	Stone	1965
exigens Dyar & Shannon	---; ---; 323	Vargas	1945
fibrinflotum Twinn	---; ---; 5	Stone	1965
	Rapids of river, on submerged vegetation; ---; 62	Twinn	1936
	---; ---; 62, 323 (Rapids of rivers, on *Myrica gale* and *Dianthera* moss, occasionally on sticks and stems in small rivers)	Stone	1964
	Rushing water of rivers, small permanent streams, on moss, vegetation, twigs; May-Sept.; 323	Stone & Jamnback	1955
flaviantenna (Stains & Knowlton)	---; ---; 323	Vargas	1945
forbesi Malloch	River; attracted to lights; 323[e]	Jobbins-Pomeroy	1916
	---; July-Aug.; 323	Metcalf	1932

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
fraternum Twinn	---; ---; 323	Twinn	1938
frisoni Dyar & Shannon	---; ---; 323	Vargas	1945
fulvum Coquillett	---; ---; 5, 323. ---; June-Aug.; 62	Vargas	1945
furculatum (Shewell)	Stream; July; 5	Sommerman et al.	1955
	Rivers; ---; 5, 62	Stone	1964
	Lake outlet; ---; 5	Stone	1952
gibsoni Twinn	Shallow, temporary streams, on stones; ---; 62	Twinn	1936
groenlandicum Enderlein	---; ---; 126	Smart	1944
gouldingi Stone	Lake outlet, warm, sluggish stream; May-June; 5	Sommerman et al.	1955
	---; ---; 5, 62, 323 (Small permanent or temporary streams, usually in wooded areas in May-July)	Stone	1964
	Stone, shallow streams at edge of woods; May, June; 62	Davies et al.	1962
	Permanent streams flowing through heavily wooded areas, small stream flowing from a blueberry-sphagnum bog and fern, under sides of rocks; May-July; 323	Stone & Jamback	1955
griseum Coquillett	Irrigation canals and drainage streams, on grasses and other aquatic vegetation; June-Sept.; 62°	Fredeen & Shemanchuk	1960
	---; June, July, Sept.; 323	Stains & Knowlton	1943
hearlei Twinn	---; ---; 323	Twinn	1938
hirtipes Fries	Cold streams; numerous in hilly, forested country, in early spring; 62°	Twinn	1936
	---; May; 62 (Running streams, on rocks, in woods in early summer)	Winn & Beaulieu	1915
	Streams; ---; 323°	O'Kane	1926

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *hunteri* Malloch	Streams; common, Ju[illegible] 5	Sommerman et al.	1955
	Streams and rivers; rare; 62	Fredeen	1958
	---; ---; 62°	Hearle	1932
	---; Aug.-Oct.; 323	Stains & Knowlton	1943
hydationis Dyar & Shannon	---; ---; 323	Vargas	1945
impar Davies, Peterson & Wood	Small stream, submerged trailing grass; May-June, 62	Davies et al.	1962
innocens (Shewell)	Trailing grass in a semi-permanent swamp outflow, amongst moss in streambed; ---; 62	Stone	1964
	Reeds in small, shallow, often temporary streams; ---; 62	Davies et al.	1962
invenustum Walker	---; ---; 62 (Running streams, on rocks, in woods in early summer)	Winn & Beaulieu	1915
jacumbae Dyar & Shannon	Spring-fed streams of moderate flow, attached to rocks, trailing grasses and roots; ---; 323	Stone & Boreham	1965
	---; July; 323	Stains & Knowlton	1943
jenningsi Malloch	---; ---; 62°. ---; June-Sept.; 323 (Rapids of rivers and larger streams, commonly attached to trailing vegetation, swarm in great numbers around man, causing annoyance)	Stone	1964
	---; ---; 62. Large creeks and rivers; abundant in summer, annoying to rivers; 323°	Stone & Jamnback	1955
	Streams; ---; 323	Jobbins-Pomeroy	1916
johannseni Hart	---; ---; 62	Vargas	1945
	Spring channels, around the submerged vegetations, near the banks and wherever there is an obstruction, attracted to light; 323°	Jobbins-Pomeroy	1916
	Submerged willows along river margin; driftwood; 323	Forbes	1912
	Attached to aquatic vegetation; ---; 323	Stone	1964
	---; July-Aug.; 323	Metcalf	1932

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
johannseni duplex Shewell & Fredeen	Emergent vegetation in swift streams; May-June; 62	Shewell & Fredeen	1958
johannseni johannseni Hart	---; ---; 323	Stone	1965
kamloopsi Hearle	Creek; ---; 62	Hearle	1932
	---; Aug.; 323	Stains & Knowlton	1943
knoltoni Twinn	---; May; 323	Stains & Knowlton	1943
lascivum Twinn	Temporary streams, rill and rapids of river, falls, larvae feed on green algae, on rocks, stones and other obstructions; ---; 62	Twinn	1936
	---: ---; 323	Vargas	1945
latipes (Meigen)	Lowland streams in submerged and trailing vegetation; July-Sept.; 5	Sommerman et al.	1955
	---; ---; 5, 323 (Common in small semi-permanent streams with rocky or gravelly bottom, bites man)	Stone	1964
	Shallow temporary streams; May-July; 62	Davies et al.	1962
	Spring-fed, young and adolescent streams; early spring; 62	Peterson & Wolfe	1958
	Cold forest streams; spring and early summer, May; 62	Wolfe & Peterson	1959
	Streams and rivers; rare; 62	Fredeen	1958
	On stone in temporary rill; ---; 62	Twinn	1936
	Temporary flowing streams; annoying to man, May-June; 323°	Stone & Jamnback	1955
longistylatum Shewell	Waterfalls, in dense masses having a moss-like appearance; June-Oct.; 62	Davies et al.	1962
luggeri Nicholson & Mickel	---; ---; 5	Stone	1965
	Rivers; Aug.; 62	Eocking & Pickering	1954

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM luggeri Nicholson & Mickel (cont.)	Emergent vegetation in swift stream; ---; 62	Shewell & Fredeen	1958
	---; abundant in June; 62°	Fredeen	1958
	Rivers; ---; 323	Stone	1964
maculatum Meigen	---; ---; 323	Wu	1931
magnum Dyar & Shannon	---; ---; 323	Vargas	1945
malyschevi Dorogostajskij, Rubzov & Vlasenko	Rivers and streams; July-Sept.; 5	Sommerman et al.	1955
	Streams and rivers; very rare; 62	Fredeen	1958
mediovittatum Knab	---; July, Aug., Sept.; 323	Stains & Knowlton	1943
meridionale Riley	---; ---; 5	Stone	1965
	River and irrigation canals, on grasses, debris and branches of willows dipping into fast-flowing water; June and Aug., 62°	Fredeen & Shemanchuk	1960
	---; ---; 62	Fredeen et al.	1953
	Warm and slow moving ditch leading from an artificial reservoir, marked preponderance in warm streams; ---; 323	O'Kane	1926
	---; July-Aug.; 323	Metcalf	1932
	---; ---; 323°	Malloch	1914
	---; ---; 323 (Small streams, on submerged dead leaves)	Forbes	1912
metallicum Bellardi	---; July-Aug.; 323	Metcalf	1932
nivus Dyar & Shannon	---; ---; 5, 62, 323	Vargas	1945
molestum Walker	---; June, July; 62 (Running streams, on rocks, in woods in early summer)	Winn & Beaulieu	1915

TABLE 1 -- BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *multidentatum* Twinn	Submerged rocks, stones, wood and debris in shallow streams; ---; 62	Twinn	1936
	---; ---; 323	Vargas	1945
mutatum Malloch	Small, temporary streams and shallow drainage ditch, grass-grown pebbly-bottomed rill; ---; 62	Twinn	1936
	---; ---; 323	Vargas	1945
mutatum *permutatum* Dyar & Shannon	---; ---; 5, 62, 323	Vargas	1945
nigrescens Knowlton & Rowe	---; ---; 323	Knowlton & Rowe	1934
nigricoxum Stone	---; July-Sept. 5	Sommerman et al.	1955
	---; ---; 62	Stone	1965
nigroparvum Twinn	Fast running water, on leaves of sweet gale and on rocks; ---; 62	Twinn	1936
	Abundant in clear streams 25 feet wide or wider, shallow river, attached to submerged rocks, moss and water willow; mountain, foothill region; 323°	Underhill	1944
notatum Adams	---; ---; 323	Stone	1965
novum Dyar & Shannon	---; ---; 62, 323	Vargas	1945
obtusum Dyar & Shannon	---; ---; 323	Vargas	1945
occidentale Townsend	---; ---; 5, 62, 323 (Bites man)	Dyar & Shannon	1927
onychodactylum Dyar & Shannon	---; ---; 323	Vargas	1945
ornatum Meigen	---; ---; 62	Graham	1965
	---; ---; 323	Wu	1931
osborni Stains & Knowlton	---; ---; 323	Vargas	1945

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *ottawaense* Twinn	Fast-flowing water; ---; 62	Twinn	1936
	---; June-Aug.; 62	Vargas	1945
pancerastes Dyar & Shannon	---; ---; 62, 323	Vargas	1945
parnassum Malloch	Permanent cold streams; ---; 62°	Stone	1964
	---; rare, July-Aug.; 62. ---; ---; 323	Wolfe & Peterson	1959
	Cool, permanent streams in heavily forested areas; numerous, annoying to man, June-Aug.; 323°	Stone & Jamnback	1955
pecuarum Riley	---; ---; 323	Vargas	1945
perissum Dyar & Shannon	Submerged stones, tufts of grass and twigs in river; ---; 62	Twinn	1936
	- -; May; 62	Vargas	1945
	---; active June-Sept.; 62	Hocking & Richards	1952
	Swift waters of stream; ---; 323	Dyar & Shannon	1927
petersoni Stone & De Foliart	Attached to rocks in shallow water along the edge of the stream; ---; 323	Peterson	1960
pictipes Hagen	---; ---; 5	Stone	1965
	Fastest part of waterfalls; June, Aug., Sept.; 62°	Davies et al.	1962
	Swift water, on rocks; above falls; 62	Twinn	1936
	Mature or old rivers; summer; 62	Peterson & Wolfe	1955
	---; July; 62 (Running streams, on rocks, in woods, in early summer)	Winn & Beaulieu	1915
	---; ---; 62, 323 (Swift, shallow water flowing over flat, sedimentary rocks, also in fast waters and boulders, attack man)	Stone	1964
	Flat sedimentary rocks where water is swift and shallow above small falls; abundant in gorges, April-Aug.; 323	Stone & Jamnback	1955

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *pictipes* Hagen (cont.)	Larger streams, on rocks, sunken posts, debris and where the current is exceedingly swift; ---; 323	Jobbins-Pomeroy	1916
pilosum Knowlton & Rowe	---; ---; 323	Twinn	1938
piperi Dyar & Shannon	Attached to rocks, trailing grass blades in streams; May; 323	Peterson	1960
piscicidium Riley	---; ---; 5	Malloch	1914
	Warm streams; ---; 323	O'Kane	1926
	---; July-Aug.; 323	Metcalf	1932
pleuralis Malloch	---; ---; 5, 62, 323	Vargas	1945
pugetense (Dyar & Shannon)	Upland and semi-upland streams, submerged branches, sticks, stems and trailing leaves; May-Oct.; 5	Sommerman et al.	1955
	Cold waterfalls and mountain streams, small forest streams, large streams during flood; ---; 5. ---; May; 62. Spring-fed stream with a fine sand bottom, dead leaves, twigs, grass; rare, April; 323°	Stone & Jammback	1955
	---; ---; 5, 62, 323 (Cold forest streams with sandy bottoms, larger rivers on vegetation, March-May)	Stone	1964
	Spring-fed pond; March-April; 62	Davies et al.	1962
	Forest streams; July, Aug.; 62	Wolfe & Peterson	1959
	Rivers; rare; 62	Fredeen	1958
quadratum Stains & Knowlton	---; ---; 323	Vargas	1945
quebecense Twinn	Rivers, attached to logs and sticks or to partly submerged twigs or trunks of small and large shrubs, cool, shallow, bog-fed stream; May, June, July; 62	Davies et al.	1962
reptans Linnaeus	---; ---; 126	Hunter	1913

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *rivuli* Twinn	Drainage ditch with pebbly bottoms, temporary rill; ---; 62	Twinn	1936
	---; Apr.-May; 323 (Small temporary streams that run over pebbly or stony bottoms)	Stone	1964
rubtzovi Smart	---; June-Aug.; 5	Sommerman et al.	1955
rugglesi Nicholson & Mickel	---; Sept.; 5	Sommerman et al.	1955
	---; ---; 5, 62, 323 (Young rivers and streams, concentrated over the shores of lakes and marshes, spring and summer)	Stone	1964
	Attached to submerged trailing grass or logs, above a silty bottom; June-July; 62	Davies et al.	1962
	Small rivers; ---; 62°	Fredeen	1958
	Emergent vegetation in swift streams; ---; 62	Shewell & Fredeen	1958
	---; Aug.; 62	Wolfe & Peterson	1959
	---; ---; 323	Stone	1965
sayi Dyar & Shannon	Streams; ---; 62	Hearle	1932
	---; July, Oct.; 323	Stains & Knowlton	1943
simile Malloch	---; ---; 323	Wu	1931
similis Malloch	---; ---; 62	Malloch	1919
slossonae Dyar & Shannon	Slow-running streams with sandy bottoms and considerable plant growth and shade; ---; 323	Underhill	1944
solarii Stone	---; ---; 323	Stone	1965
stonei Stains & Knowlton	---; Sept., Oct.; 323	Stains & Knowlton	1943
subexcisum Edwards	On stones in temporary rill; ---; 62	Twinn	1936
	---; rare, June-July; 62	Wolfe & Peterson	1959
	---; ---; 351	Shewell & Fredeen	1958

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
taeniatifrons Enderlein	---; ---; 323	Vargas	1945
tenuicalx Enderlein	---; ---; 323	Vargas	1945
tescorum Stone & Boreham	In small spring-fed streams of moderate flow, attached to rocks, trailing grasses and roots; active in the late afternoon, above the ground over small trees near the streams, anthrophilic and vicious biters, abundant; 323°	Stone & Boreham	1965
transiens Rubzov	Streams and rivers; rare; 62	Fredeen	1958
trivittatum Malloch	---; ---; 323	Stone	1965
tuberosum (Lundstroem)	Lake outlet shallow, streams with loose, rocky bottoms, directly exposed to the sun, surfaces of stones, on logs and trailing vegetation; attracted to humans and their crawling can be annoying, May-Sept.; 5°	Sommerman et al.	1955
	---; ---; 5, 126. ---; May-Sept.; 323 (A wide variety of permanent streams, bites man)	Stone	1964
	Permanent streams and rivers, calm water on lake shore among stones just above lake outlet; June-Sept.; 62°	Wolfe & Peterson	1959
	Irrigation canals, rivers, attached to rocks and vegetation; ---; 62	Fredeen & Shemanchuk	1960
	Permanent streams, anthropophilic; annoying; 323°	Stone & Jamnback	1955
	Attached to rocks, banks of small stream and rivers; ---; 323	Peterson	1960
turmale Twinn	---; ---; 323	Twinn	1938
unicum Twinn	---; ---; 323	Vargas	1945
vandalicum Dyar & Shannon	---; ---; 323	Vargas	1945

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM			
venator Dyar & Shannon	---; ---; 323	Stone	1965
venustoides Hart	---; ---; 323	Forbes	1912
venustum Say	Semi-upland and lowland streams, submerged sedges, trailing vegetation, grass blades, stones and logs attachment; crawling and biting nuisance, Sept.; 5°	Sommerman et al.	1955
	Lake outlets and drains from marshes and bogs with alkalinity at altitudes from sea level to 2,000 feet; abundant, May-Aug.; 5	Jenkins	1948
	---; ---; 5, 126. ---: April-June; 323 (Commonest species in small, permanent, semi-permanent and larger streams, feed on man)	Stone	1964
	All types and bodies of running water, permanent and temporary rivers, streams, rills, immature stages on rocks, logs, aquatic plants, drainage ditches; active May-Oct., peak June-July; 62°	Twinn	1936
	Streams, stones and logs at waterline, upper surfaces and borders of trailing vegetation in calm waters above lake outlets, torrents to slow-moving creeks and ditches, rill sections and small rapids at lake outlets and pools, aquatic grasses, floating blade of grass above rill sections; abundant; 62	Wolfe & Peterson	1959
	---; abundant and troublesome at high elevations; 62°	Hearle	1929
	Submerged grass blades in small streams; active from 3:00 p.m. to dusk, worst attack occur in early spring to fall, peak Sept.; 323°	Jobbins-Pomeroy	1916
	On leaves of aquatic plants, stones, logs and other objects in the streams at or near water level; active from 5:00 to 8:00 p.m.; 323	Wu	1931
	Trees and other vegetation along a creek, from pastures, vacant lots, gardens and house windows; April-Oct.; 323	Forbes	1912
	---; ---; 323 (Bites in greatest numbers in or near woods and brush, abundant along banks of trout streams, inject venom that causes general physiological reactions and occasionally pronounced illness, bites by day)	Metcalf	1932

TABLE 1 - BLACK FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM vereecundum Stone & Jamnback	---; June, Oct.; 5. ---; April-Sept., Nov.; 323	Stone & Jamnback	1955
	Rivers and streams; common, May-Aug.; 62	Fredeen	1964
	Dam; ---; 62	Wolfe & Peterson	1959
virgatum Coquillett	---; ---; 62	Hearle	1929
	---; June, Aug.; 323	Stains & Knowlton	1943
virgatum canadensis Hearle	Small, permanent and semi-permanent stream, swift running with rocky ripples and boulders; ---; 62	Hearle	1932
vittatum Zetterstedt	Semi-upland and lowland streams with loose rocks on the bottom and attached to all surfaces of the stones, also from logs and trailing vegetation; attracted and annoying to man, May-Sept., peak July and Aug.; 5°	Sommerman et al.	1955
	Lake outlets with beds composed of rocks, logs, sticks and occasionally vegetation and sand with alkalinity under 1,000 feet elevation; abundant; 5	Jenkins	1948
	---; ---; 5, 126. ---; May, July-Sept., Dec.; 323 (Any type of flowing water, adults swarm about man, entering eyes, ears, nose or mouth)	Stone	1964
	---; ---; 7	Stone	1952
	Drainage stream, supply and irrigation canals, permanent flowing streams, among rocks, on aquatic and emergent vegetation, on debris and branches of willows dipping into fast-flowing water and all extremes of environment provided by irrigation; abundant and widely distributed; 62	Fredeen & Shemanchuk	1960
	Streams draining a warm lake or swamp water rich with suspended algae overwinters under the ice in small streams; abundant in summer; 62	Fredeen	1958
	River, submerged rocks in the rapids; in the open by the river and in the woods; 62	Twinn et al.	1948
	On submerged objects in streams of widely varying widths; April-Nov.; 62	Davies et al.	1962
	---; active and most troublesome in the evening; 62°	Hocking & Pickering	1954
	---; ---; 126°	Longstaff	1932

TABLE 1 - BLACK FLIES (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY: DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SIMULIUM *vittatum* Zetterstedt (cont.)	Below dams, lake outlets, below large pools; Feb., April-Nov.; 323[e]	Stone & Jamnback	1955
	On grass blades on small stones of a small stream and bridge piles in the rivers; ---; 323	Jobbins-Pomeroy	1916
	Shore lines; ---; 323	Forbes	1912
	Warm streams; ---; 323	O'Kane	1926
wyomingense Stone & DeFoliart	---; ---; 323	Stone	1965
THAUMALEA *americana* Bezzi	---; ---; 62. ---; March; 323 (Wet rocks of cold streams usually in the shade and always where the surface is covered with a thin fil of water not deep enough to submerge them)	Stone	1964
TITANOPTERYX *meridionalis* (Riley)	---; ---; 323	Enderlein	1935
TRINNIA *tibbiesi* Stone & Jamnback	Cold, spring-fed streams in birch-maple woods; ---; 62	Davies et al.	1962
	---; June-Sept.; 62. ---; April; 323	Stone & Jamnback	1955
	Small permanent brook; ---; 323	Stone	1954
WILHELMIA *vittata* Zetterstedt	---; ---; 125, 323	Enderlein	1925

LITERATURE CITED

Davies, D. M.
1949. Description of *Simulium euryadminiculum*, a new species of blackfly (Simuliidae: Diptera). Canad. Ent. 81(2):45-49.

_____.
1952. The population and activity of adult black flies in the vicinity of a stream in Algonquin Park, Ontario. Can. J. Zool. 30:297-321.

_____. & P. D. Syme
1958. Three new Ontario black flies of the genus *Prosimulium* (Diptera:Simuliidae). Part II. Ecological observations and experiments. Canad. Ent. 90(12):744-759.

_____., B. V. Peterson & D. M. Wood
1962. The black flies (Diptera:Simuliidae) of Ontario. Part I. Adult identification and distribution with description of six new species. Proc. ent. Soc. Ont. (1961) 1962. 92:71-154.

Dyar, H. G. & R. C. Shannon
1927. The North American two-winged flies of the family Simuliidae. Proc. U. S. nat. Mus. 69(2636):54.

Enderlein, G.
1925. Weitere Beiträge zur Kenntnis der Simuliiden und ihrer Verbreitung. Zool. Amer. 62(9-10):201-211.

_____.
1935. Neue Simuliiden, besonders aus Afrika. S. B. Ges. naturf. Fr. Berl., 1934. pp. 358-364.

Forbes, S. A.
1912. On black flies and buffalo gnats (*Simulium*) as possible carriers of pellagra in Illinois. Rep. St. Ent. Ill. 27:21-55.

Fredeen, F. J. H.
1958. Black flies (Diptera:Simuliidae) of the agricultural areas of Manitoba, Saskatchewan, and Alberta. Proc. Int. Congr. Ent. 10:819-823.

_____.
1964. Bacteria as food for blackfly larvae (Diptera:Simuliidae) in laboratory cultures and in natural streams. Can. J. Zool. 42(4):527-548.

_____. & J. A. Shemanchuk
1960. Black flies (Diptera:Simuliidae) of irrigation systems in Saskatchewan and Alberta. Can. J. Zool. 38(4):723-735.

_____., J. W. T. Spinks, J. R. Anderson, A. P. Arnason & J. G. Rempel
1953. Mass tagging of black flies (Diptera:Simuliidae) with radiophosphorus. Can. J. Zool. 31:1-15.

Goulding, R. L., Jr. & C. C. Deonier
1950. Observations on the control and ecology of black flies in Pennsylvania. J. econ. Ent. 43(5):702-704.

Graham, A. R.
1965. A preliminary list of the natural enemies of Canadian agricultural pests. Inf. Bull. Res. Inst. Belleville. 4:179 p.

Hearle, E.
1929. Insects of the season 1928 in British Columbia Insects affecting live stock and man. Rep. ent. Soc. Ont. 59:31-36.

_____.
1932. The blackflies of British Columbia (Simuliidae,Diptera). Proc. ent. Soc. B. C. no. 29. 5-19 p.

Hocking, B.
1950. Further tests of insecticides against black flies (Diptera:Simuliidae) and a control procedure. Sci. Agric. 30(12):489-504.

_____. & L. R. Pickering
1954. Observations on the bionomics of some northern species of Simuliidae (Diptera). Canad. J. Zool. 32(2):99-119.

_____. & W. R. Richards
1952. Biology and control of Labrador black flies (Diptera:Simulidae). Bull ent. Res. 43(2):237-257.

Hunter, S. J.
1913. University experiments with sand fly and pellagra. Kans. Univ. Sci. Bull. 8(8):313-320.

Jenkins, D. W.
1948. Ecological observations on the blackflies and punkies of Central Alaska. Mosqui News. 8(4):148-154.

Jobbins-Pomeroy, A. W.
1916. Notes on five North American buffalo gnats of the genus *Simulium*. Bull. U. S. Dep. Agric. no. 329. 48 p.

Knowlton, G. F. & J. A. Rowe
1934. New blood-sucking flies from Utah (Simuliidae,Diptera). Ann. ent. Soc. Amer. 27(4):580-584.

Longstaff, T. G.
1932. An ecological reconnaissance in West Greenland. J. Anim. Ecol. 1(2):119-142.

Malloch, J. R.
1914. American black flies or buffalo gnats. Tech. Ser. U. S. Bur. Ent. no. 26. 72 p.

_____.
1919. The Diptera collected by the Canadian Arctic expedition, 1913-1918 (excluding the Tipulidae and Culicidae). Rep. Canad. arct. Exped. 3:34-90.

Metcalf, C. L.
1932. Black flies and other biting flies of the Adirondacks. Bull. N. Y. St. Mus. 289:5-58.

Nicholson, H. P.
1945. The morphology of the mouthparts of the non-biting blackfly, *Eusimulium decorterse* D. & S., as compared with those of the biting species, *Simulium venustum* Say (Diptera:Simuliidae). Ann. ent. Soc. Amer. 38(2):281-297.

O'Kane, W. C.
1926. Black flies in New Hampshire. Tech. Bull. N. H. agric. Exp. Sta. no. 32. 24 p.

Parker, R. R.
1934. Recent studies of tick-borne diseases made at the United States Public Health Service at Hamilton, Montana. Proc. Pan-Pacif. sci. Congr 1933. pp. 3367-3374.

Peterson, B. V.
1960. Notes on some natural enemies of Utah black flies (Diptera:Simuliidae). Canad. Ent. 92(4):266-274.

_____, D. G. & L. S. Wolfe
1958. The biology and control of black flies (Diptera:Simuliidae) in Canada. Proc. Int. Congr. Ent. 3:551-564.

Shewell, G. E.
1952. New Canadian black flies (Diptera:Simuliidae). I. Canad. Ent. 84(12):33-42.

_____. & J. H. Predeen
1958. Two new black flies from Saskatchewan (Diptera:Simuliidae). Canad. Ent. 90(12):733-738.

Smart, I.
1944. Notes on Simuliidae (Diptera). II. Proc. R. ent. Soc. Lond. (B). 13(11-12):131-136.

Sommerman, K. M.
1964. *Prosimulium esselbaughi* new species. The Alaskan *P. hirtipes* 2 (Diptera Similiidae). Proc. ent. Soc. Wash. 66(3):141-145.

_____., R. I. Sailer & C. O. Esselbaugh
1955. Biology of Alaskan black flies (Simuliidae, Diptera). Ecol. Monogr. 25:345-385.

Stains, G. S. & G. F. Knowlton
1943. A taxonomic and distributional study of Simuliidae of western United States. Ann. ent. Soc. Amer. 36(2):259-280.

Stone, A.
1952. The Simuliidae of Alaska. Proc. ent. Soc. Wash. 54(2):69-96.

_____.
1964. Guide to the insects of Connecticut pt. VI. The diptera or true flies of Connecticut (Simuliidae and Thaumaleidae). Bull. Conn. St. geol. nat. Hist. Surv. 97:126 p.

_____.
1965. Family Simuliidae. pp. 181-191. *In*: A catalog of the diptera of America north of Mexico. Agricultural Research Service, United States Dept. of Agriculture. 1696 p.

_____. & M. M. Borehem
1965. A new species of Simulium from the Southwestern United States. (Diptera: Simuliidae). J. med. Ent. 2(2):164-170.

_____. & H. A. Jamnback
1955. The black flies of New York State (Diptera:Simuliidae). Bull. N. Y. St. Mus. 349:144 p.

Twinn, C. R.
1936. The blackflies of eastern Canada (Simuliidae,Diptera). Parts I-II. Canad. J. Res. (D). 14(9-10):97-150.

_____.
1938. Blackflies from Utah and Idaho, with descriptions of new species (Simuliidae, Diptera). Canad. Ent. 70(3):48-55.

_____., B. Hocking, W. C. McDuffie & H. F. Cross
1948. A preliminary account of the biting flies at Churchill, Manitoba. Canad. J. Res. (D). 26(6):334-357.

Underhill, G. W.
1944. Blackflies found feeding on turkeys in Virginia (*Simulium nigroparvum* Twinn and *Simulium slossonae* Dyar and Shannon). Tech. Bull. Va agric. Exp. Sta. no. 94. 32 p.

Vargas, L.
1945. Simúlidos del nuevo mundo. Monogr. Inst. Salubr. Enferm. trop. no. 1. 241 p.

Walker, G. P.
1927. A blackfly (*Simulium bracteatum*) fatal to goslings. Canad. Ent. 59(6):123 p.

Weber, N. A.
1950. A survey of the insects and related arthropods of Arctic Alaska. Part I. Trans. Amer. ent. Soc. 76(3):147-206.

Winn, A. F. & G. Beaulieu
1915. A preliminary list of the insects of the province of Quebec. Part II. Rep. Quebec Soc. Prot. Pl. 7:108-159.

_____. & _____.
1932. A preliminary list of the insects of the province of Quebec. Part II. Diptera. Rep. Quebec Soc. Prot. Pl. 24:100 p.

Wolfe, L. S. & D. G. Peterson
1959 Black flies (Diptera.Simuliidae) of the forests of Quebec. Can. J. Zool. 37(2):137-159.

_____. & _____.
1960. Diurnal behavior and biting habits of black flies (Diptera:Simuliidae) in the forests of Quebec. Can. J. Zool. 38(3):489-497.

Wu, Yi Fang
1931. A contribution to the biology of *Simulium* (Diptera). Pap. Mich. Acad. Sci. 13:543-599.

C. SAND FLIES

The sand fly entries include a few species of Psychodinae which do not bite but may be pests of man, often causing allergic reactions. Little is to be found in the literature on the biologies and disease transmissions of these species. Most of the data are distributional records.

The table includes 13 species or subspecies, most of which are in the large genus *Phlebotomus*.

TABLE 1 - SAND FLIES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PHLEBOTOMUS			
anthophorus Addis	---; ---; 323	Quate	1965
aquilonius Fairchild & Harwood	---; ---; 323	Quate	1965
californicus Fairchild & Hertig	---; ---; 323	Quate	1965
diabolicus Hall	---; ---; 323°	Packchanian	1946
	---; ---; 323	Quate	1965
limai Fonseca	---; ---; 323	Packchanian	1946
	---; ---; 323°	Thurman et al.	1949
oppidanus Dampf	---; ---; 323	Quate	1965
shannoni Dyar	---; found in swamp, partially shaded with vegetation, rich in organic matter and brackish water, bites man below the waistline, active at night; 323°	Thurman et al.	1949
	---; ---; 323	Quate	1965
stewarti Magnabeira & Calindo	---; burrows of ground squirrels; 323	Packchanian	1946
texanus Dampf	---; ant nest; 323	Packchanian	1946
vexator Coquillett	---; burrows of ground squirrels; 323	Packchanian	1946
vexator occidentis Fairchild & Hertig	---; ---; 323	Quate	1965
vexator vexator Coquillett	---; ---; 323	Quate	1965
PSYCHODA			
alternata Say	Shallow water, highly moist organic solids such as sewage filters, exposed sewage, plumbing traps, water pipes, wash-water overflow, compost, bird's nests, human sputum; weak fliers, rest in shaded areas or on foliage during the day, attracted to lights, enter houses; 323	Scott	1964

LITERATURE CITED

Packchanian, A.
1946. The distribution of species of sandflies, genus *Phlebotomus*, in the United States and their relation to the transmission of leishmaniasis. Tex. Rep. Biol. Med. 4(1):35-41.

Quate, L. W.
1965. Family Psychodidae. pp. 91-97. *In*: A catalog of the diptera of America north of Mexico. Agricultural Research Service, United States Dept. of Agriculture. 1696 p.

Scott, H. G.
1964. Filter fly larva (*Psychoda alternata*) from human sputum. Florida Ent. 47(1):53.

Thurman, D. C. Jr., J. A. Mulrennan & E. B. Thurman
1949. Occurrence of *Phlebotomus* (*Neophlebotomus*) *shannoni* Dyar in Florida (Diptera, Psychodidae). J. Parasit. 35(2):199-200.

D. MIDGES

The midges include representatives from the family Ceratopogonidae. In some areas the biting species, especially *Culicoides*, are called "sand flies". Little is known of the biology of individual species; however, the larvae are known to occur either in water or in moist terrestrial environments. Although quite important as pests, these biting midges are vectors for several disease organisms in other countries. No disease transmission is recorded for America North of Mexico.

The table includes 122 species or subspecies, most of which are in the large genus *Culicoides*.

TABLE 1 - MIDGES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES			
alacha Jamnback & Wirth	---; ---; 323	Wirth	1965
alaskensis Wirth	---; July-Aug.; 5	Sailer et al.	1956
alexanderi Wirth & Hubert	---; ---; 62. ---; April-June; 323°	Jamnback	1965
	---; ---; 323	Wirth	1965
arboricola Root & Hoffman	Moist and wet sites, in tree holes or hollow stumps; Feb.-Dec.; 323	Jamnback	1965
arizonensis Wirth & Hubert	---; ---; 323	Wirth	1965
arubae Fox & Hoffman	---; ---; 323	Wirth	1965
barbosai Wirth & Blanton	---; ---; 323 (Salt marsh pest)	Wirth	1965
baueri Hoffman	Stream and spring margin, creek margin; April-Sept.; 323	Jamnback	1965
	---; in light trap; 323	James	1943
bermudensis Williams	Salt marsh sod, saline water, salt water pool margins, salt water well overflow area; April, May, Aug.: 323	Jamnback	1965
bickleyi Wirth & Hubert	---; ---; 62. Swamp margin, sphagnum bog, stream margin, soft mud below water, surface in small woodland stream, decaying hay, grass roots and humus at swamp sites and thick sphagnum of margins of swamp; March, May-July; 323°	Jamnback	1965
biguttatus Coquillett	Small bog near a stream and area open and unshaded; July; 5	Jenkins	1948
	---; ---; 62. Lakes, pools, streams, moist leaf depressions, moist sand, mud, decaying leaves, semi-permanent woodland pool, cedar bog, grassy marsh sites, spruce and hemlock with black mud beneath, grass, grass roots, humus and clay soil; light traps, April-Oct.; 323	Jamnback	1965

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES *biguttatus* Coquillett (cont.)	Pitcher plants, tree holes and rock holes; in houses, attracted to lights, active after dark to dawn, biting peak 9:00 to 11:00 at night; 323°	Metcalf	1932
blantoni Vargas & Wirth	---; ---; 323	Wirth	1965
borinqueni Fox & Hoffman	Tree holes; May, Oct.; 323°	Wirth & Bottimer	1956
bottimeri Wirth	Pond margin; March, Oct.; 323	Wirth & Bottimer	1956
brookmani Wirth	---; ---; 323	Wirth	1965
butleri Wirth & Hubert	---; ---; 323	Wirth	1965
cacticola Wirth & Hubert	---; ---; 323	Wirth	1965
canithorax Hoffman	---; in light trap; 323°	Foote & Pratt	1954
	---; coastal area; 323	Root & Hoffman	1937
cavaticus Wirth & Jones	---; ---; 323	Wirth	1965
chiopterus (Meigen)	---; ---; 5, 62. Moist straw, moist polluted soil; light traps, May-Oct.; 323	Jamnback	1965
cockerellii (Coquillett)	---; ---; 5, 62. ---; June-Aug.; 323	Wirth	1952
	---; light trap; 323	Foote & Pratt	1954
cockerellii *saltonensis* Wirth	---; ---; 323	Wirth	1952
cockerellii var. *tristriatulus* Hoffman	---; ---; 5°	Sailer et al.	1958
	---; ---; 323	Vargas	1949

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES crepuscularis Malloch	---; ---; 62. Mossy bank of stress inlet, grassy stream margins, muddy brook, ivory, grassy puddle, cedar bog stream, swamp, grass roots, humus, hoofprints, swamp lagoon margin, creek margin, highly saline to fresh water, muddy, sandy pond margins, puddles at water tank and septic tank; serious pest of man, spring and fall, March, May-Sept.; 323°	Jamnback	1965
	---; Feb., October; 323	Wirth & Bottimer	1953
daedalus Macfie	---; ---; 323	Wirth	1965
debilipalpus Lutz	---; ---; 323	Wirth	1965
denningi Foote & Pratt	---; ---; 62, 323	Wirth	1965
denticulatus Wirth & Hubert	---; ---; 62. River pool margin, mud, decayed leaves, leaf depression, open margin under tree roots, dead sphagnum and soft mud, sand and mud margin, near marsh; May-June; 323	Jamnback	1965
dicker Jones	---; ---; 62	Wirth	1965
	---; light traps, June-July; 323	Jamnback	1965
dovei Hall	Shaded wet soil, ditches, near barriers, in depressions of salt marshes; ---; 323	Hull et al.	1934
downesi Wirth & Hubert	---; ---; 62. Bog; June-Aug.; 323	Jamnback	1965
floridensis Beck	---; ---; 323	Wirth	1965
flukei Jones	Tree hole, pitcher plant; May-July; 323	Jamnback	1965
footei Wirth & Jones	---; ---; 62, 323	Wirth	1965
furens (Poey)	Drainage ditches between high and low tide where soil is covered with soft, wet sediment, low areas saturated with shallow water or frequent tidal flooding. shaded areas, edges of bays and drainage ditches with the plant cover *Spartina alterniflora*; June-Aug., peak July; 323	Jamnback	1965
	---; light traps; 323°	Fox	1946

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
JULICOIDES furensoides Williams	Near marsh, sphagnum mat at the edge of pond; June-July; 323	Jamnback	1965
gigas Root & Hoffman	---; ---; 62	Wirth	1965
guttipennis (Coquillett)	Dirty water in tree holes, in stumps of poplar trees, predaceous; enter houses, attracted to light, active from dark to dawn, July; 323°	Metcalf	1932
	Moist or wet tree holes; light traps, Jan., April-Oct.; 323	Jamnback	1965
haematopotus Malloch	---; light trap, June-July; 62. Margins of streams, ponds, pools with moist or wet sand or decaying leaf mold, septic tank, stream margins, muddy sand bar in stream, river-side pool, pond margin, swamp; ---; 323	Jamnback	1965
	---; light trap, May-Sept.; 323	James	1943
	---; Feb., Nov.; 323°	Wirth & Bottimer	1956
hieroglyphicus Malloch	---; light trap, May-Sept.; 323	James	1943
	---; March; 323	Wirth & Bottimer	1956
hirmani Khalaf	---; ---; 5, 323	Wirth	1965
hirtulus Coquillett	---; ---; 5, 323	Wirth	1965
hollensis (Melander & Brues)	---; ---; 62, 323 (Salt marsh pest)	Wirth	1965
	Salt marshes with much vegetation, soft mud on top of sod, margins of bays and drainage ditches with vegetation; March-Aug.; 323°	Jamnback	1965
inanollae Fox & Hoffman	---; ---; 323	Foote & Pratt	1954
insignis Lutz	---; ---; 323	Wirth	1965
jamaicensis Edwards	---; Feb., October; 323	Wirth & Bottimer	1956

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES			
jamesi Fox	---; ---; 62, 323	Wirth	1965
jamnbacki Wirth & Hubert	---; ---; 62. Woodland sites including seeps, stream margins, temporary pools, swamps, marshes with soft mud either bare or covered by growth of sphagnum or grass, decaying leaves; May-July; 323	Jamnback	1965
jonesi Wirth & Hubert	---; ---; 323	Wirth	1965
khalafi Beck	---; ---; 323 (Salt marsh pest)	Wirth	1965
knowltoni Beck	---; ---; 323	Wirth	1965
loughnani Edwards	---; ---; 323	Wirth	1965
lugiani Jones & Wirth	---; ---; 323	Wirth	1965
luteovenus Root	---; ---; 5, 323	Root & Hoffman	1937
melleus (Coquillett)	Inter-tidal sand in protected bays or inlets; serious pest along coast, March-July; 323°	Jamnback	1965
	---; ---; 323	Wirth	1965
minutissimus Zetterstedt	---; ---; 126	Wirth	1965
mississippiensis Hoffman	---; salt marsh pest; 323°	Wirth	1965
mohave Wirth	---; ---; 323	Wirth	1965
monoensis Wirth	Seepage areas at lake margins; ---; 323	Wirth	1952
mulrennani Beck	---; ---; 323	Wirth	1965
multipunctatus Malloch	Mud at pond margins; Feb., Nov.; 323	Wirth & Bottimer	1955
	---; at light; 323	Malloch	1915

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES	---; ---; 62	Wirth	1965
nanus Root & Hoffman	Tree holes; ---; 323	Root & Hoffman	1937
	---; in light traps; 323	Foote & Pratt	1954
neopulicaris Wirth	---; March, Oct.; 323	Wirth & Bottimer	1956
niger Root & Hoffman	Cattail marsh cut off by embankment containing fresh and brackish water; Feb.-Mar., May-June; 323	Jamnback	1965
	Partly brackish water; ---; 323	Foote & Pratt	1954
nocivum Harris	---; ---; 323	Vargas	1949
obsoletus (Meigen)	*Carex* marshes along coast; common in lower altitudes and abundant along the coast up to 1000 feet elevation, in woods or wooded areas during day, bite in open areas in the evening, June-Aug.; 5°	Jenkins	1948
	---; bite inflicts a sharp needle-point pain and leaves a lingering irritation, most active toward sundown and after dusk, also at daytime in shady situations or in the open; 62°	Twinn	1931
	---; light trap, bites man; 323°. Moist straw, pile of decaying spruce needles, mixed with twigs and wood chips, polluted soil; ---; 351	Jamnback	1965
	---; active May-Sept., in light trap; 323	James	1943
oklahomensis Khalaf	---; ---; 323	Wirth	1965
ousairani Khalaf	Tree holes; March, Oct.; 323	Wirth & Bottimer	1956
palmerae James	---; ---; 62	Wirth	1965
	---; in light trap, June-Aug.; 323	James	1943
paraensis (Goeldi)	---; ---; 323	Wirth	1965
pecosensis Wirth	Tree hole; light trap, April, Aug.; 323	Wirth & Bottimer	1956

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES			
pifanoi Ortiz	---; ---; 323	Wirth	1965
piliferus Root & Hoffman	---; ---; 62. Small streams in woodland or open marsh with soft mud or mud with grass roots or sand and silt at the edge of small stream, sphagnum bog; April, June-Aug.; 323*	Jamnback	1965
	---; inland; 323	Foote & Pratt	1954
pseudopiliferus Wirth & Hubert	---; ---; 62. Muddy brook, small pond, muddy habitat; May-June; 323°	Jamnback	1965
pusillus Lutz	---; ---; 323	Wirth	1965
reevesi Wirth	---; ---; 323°	Wirth	1952
riethi Kieffer	---; ---; 5	Gutzevich	1960
riggsi Khalaf	---; ---; 323	Wirth	1965
ryckmani Wirth & Hubert	---; ---; 323	Wirth	1965
salihi Khalaf	---; April, October; 323	Wirth & Bottimer	1956
saltonensis Wirth	---; ---; 323	Wirth	1965
sanguisuga (Coquillett)	---; ---; 5 (Forest area pest)	Wirth	1965
	---; abundant and vicious pest of man, in forest; 62°. Well-drained slopes where leaves accumulate in fallen logs or boulders; abundant and vicious pest of man, in forest, May-Aug.; 323*	Jamnback	1965
scanloni Wirth & Hubert	Osmunda fernbog; March-July; 323	Jamnback	1965
simulans Root & Hoffman	---; ---; 323	Wirth	19[illegible]
sitiens Wirth & Hubert	---; ---; 323	Wirth	1965
snowi Wirth & Jones	---; ---; 62, 323	Wirth	1965

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES *sordidellus* (Zetterstedt)	---; bites man in evening in forest, July-Aug.; 5°	Jenkins	1948
	---; ---; 126	Vargas	1949
sphagnumensis Williams	---; ---; 5	Wirth	1965
	---; June; 62. Sphagnum mat at edge of pond and on lake shore; July-Aug.; 323	Jamnback	1965
spinosus Root & Hoffman	Marsh; June; 62. Stream margin, muddy brook edge, swampy woods, ivory grassy puddle, cedar bog, sand bar, stream or stream margin, grass and mud, pine grove, creek margin, marsh, lake margin, swamp, saturated grass roots and clay soil; April-Aug., Nov.; 323°	Jamnback	1965
	Mud at pond margin; March, Oct., 323	Wirth & Bottimer	1956
stellifer (Coquillett)	---; ---; 62. Cedar bog, creek margin, stream margin, pond or pools, either in mud or soil with grass roots; April-Oct., peak April-Aug.; 323°	Jamnback	1965
	---; in light trap; 323	James	1943
stilobezzioides Foote & Pratt	---; June; 62. ---; May-June; 323°	Jamnback	1965
stonei James	---; June-Aug., at light; 323	James	1943
tenuistylus Wirth	---; ---; 323	Wirth	1965
testudinalis Wirth & Hubert	Sphagnum bog, Osmunda fernbog, swamp; May-July; 323°	Jamnback	1965
transiens Walker	---; ---; 62	Vargas	1949
travisi Vargas	---; ---; 62. Wet meadow depression, near marsh, leaves beside stream, cattail marsh beside road, wet grass and mud, sedimentary rock stream, stream and lake margins; abundant at ground level, April-Oct.; 323°	Jamnback	1965
tristriatulus Hoffman	Tide flats, salt grass marshes along coast, bogs; open fields, sitka spruce-hemlock forests, bites morning and evening, June-Aug.; 5°	Jenkins	1948
	Bank of fresh water stream covered by overflow at high tide; common June-Aug.; 5	Sailer et al.	1956
	---; ---; 323	Wirth	1965

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES			
unicolor (Coquillett)	---; ---; 5, 62. ---; June-Sept.; 323	Wirth	1952
usingeri (Wirth)	---; ---; 323	Wirth	1965
utahensis Fox	---; July-Aug.; 323	Wirth	1952
utowana Jamnback	Partially flooded leaf depression; May-June; 323	Jamnback	1965
variipennis (Coquillett)	---; ---; 62	Curtis	1941
	Sand and mud at pond margins, heavily polluted mud; Jan., Oct.; 323	Wirth & Bottimer	1956
	Salt marshes and sand dunes; ---; 323°	Foote & Pratt	1954
	---; active April; 323	Wirth	1952
	---; May-Aug., in light trap; 323	James	1943
variipennis albertensis Wirth & Jones	---; ---; 323	Wirth	1965
variipennis australis Wirth & Jones	---; ---; 323	Wirth	1965
variipennis occidentalis Wirth & Jones	---; ---; 62, 323	Wirth	1965
variipennis sonorensis Wirth & Jones	---; ---; 323	Wirth	1965
variipennis variipennis (Coquillett)	---; ---; 62. Salt marsh, mud, cow manure in wet area near water tank, clay-loam margin of creek; Jan., July-Oct.; 323	Jamnback	1965
venustus Hoffman	---; ---; 62	Wirth	1965
	Stream edge, muddy brook, grassy puddle, swamp, wet meadow, cow hoofprints, creek margin, mud with grass roots, sphagnum moss bordering stream; light traps, May-July, Sept.-Nov., peak June and July; 323	Jamnback	1965

TABLE 1 - MIDGES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CULICOIDES	---; ---; 5	Wirth	1965
villosipennis Root & Hoffman	Moist or wet tree holes, sphagnum bog; June-Aug.;	Jamnback	1965
	---; light trap; 323	Root & Hoffman	1937
weesi Khalaf	---; light trap, March; 323	Wirth & Bottimer	1956
wirthi Foote & Pratt	---; ---; 62	Wirth	1965
wisconsinensis Jones	Marsh, lagoon margin, brackish water marsh in saline area with soft mud over firmer sod, peat muck at lake margin; light trap, May-Oct.; 323	Jamnback	1965
yukonensis Hoffman	Stream with muck bottom and swift current; July-Sept.; 5	Sailer et al.	1956
	---; open bogs, *Carex* marshes near sea level to an elevation of about 2,000 feet, bite in spruce forests and edges of woods in open fields throughout the day, July-Aug.; 5°	Jenkins	1948
	---; ---; 62	Wirth	1965
LEPTOCONOPS			
bequaerti (Kieffer)	---; ---; 323	Wirth	1965
carteri Hoffman	---; ---; 323°	Hoffman	1926
catawbae (Boesel)	---; ---; 62, 323	Wirth	1965
floridensis Wirth	---; ---; 323	Wirth	1965
freeborni Wirth	---; ---; 323	Wirth	1965
kerteszi Kieffer	---; June; 62	Curtis	1957
	Damp sand with organic matter or above high-tide level in the month of fresh-water streams along seacoast; April-October, near salt and alkali lakes; 323°	Wirth	1952
kerteszi americanus Carter	---; ---; 323°	Carter	1921

TABLE 1 - MIDGES (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
LEPTOCONOPS torrens (Townsend)	---; active May; 323°	Wirth	1952
	---; June-Aug.; 323	Carter	1921
PSEUDOCULICOIDES cinctus Coquillett	---; ---; 323°	Malloch	1915

LITERATURE CITED

Carter, H. F.
1921. A revision of the genus *Leptoconops*, Skuse. Bull. ent. Res. 12(1).1-28.

Curtis, L. C.
1941. A preliminary list of the species of *Culicoides* in Western Canada (Diptera: Ceratopogonidae). Proc. ent. Soc. B. C. no. 37. 18-19 p.

_____.
1957. Occurrence of *Leptoconops kertesszi* Kieffer in British Columbia. Proc. ent. Soc. B. C. 53:18.

Foote, R. H. & H. D. Pratt
1954. The Culicoides of the Eastern United States. U. S. Dep. of Health, Education & Welfare. Mon. 18:53.

Fox, I.
1946. A review of the species of biting midges or *Culicoides* from the Caribbean Region (Diptera:Ceratopogonidae). Ann. ent. Soc. Amer. 39(2):248-258.

Gutzevich, A. V.
1960. Blood-sucking Ceratopogonids (*Culicoides* and *Leptoconops* spp.) (Diptera, Heleidae) of the fauna of the U.S.S.R. Opred. Faune SSSR. no. 72. 131 p.

Hoffman, W. A.
1926. Two new species of American *Leptoconops* (Diptera,Chironomidae). Bull. ent. Res. 27(2):133-136.

Hull, J. B., W. E. Dove & F. M. Prince
1934. Seasonal incidence and concentrations of sandfly larvae, *Culicoides dovei* Hall, in salt marshes (Ceratopogoninae:Diptera). J. Parasit. 20(3):162-172.

James, M. T.
1943. The genus *Culicoides* in northern Colorado (Diptera,Ceratopogonidae). Pan-Pacif. Ent. 19(4):148-153.

Jamnback, H.
1965. The *Cul coides* of New York State (Diptera:Ceratopogonidae). Bull. N. Y. St. Mus. 399:154 p.

Jenkins, D. W.
1948. Ecological observations on the blackflies and punkies of Central Alaska. Mosquito News. 8(4):148-154.

Malloch, J. R.
1915. The Chironomidae, or midges, of Illinois, with particular reference to the species occuring in the Illinois River. Bull. Ill. Lab. nat. Hist. 10:275-543.

Metcalf, C. L.
1932. Black flies and other biting flies of the Adirondacks. Bull. N. Y. St. Mus. 289:5-58.

Root, F. M. & W. A. Hoffman
1937. The North American species of *Culicoides*. Amer. J. Hyg. 25(1):150-176.

Sailer, R. I., E. P. Marks & S. Lienk
1956. Notes on *Culicoides* in Alaska (Diptera,Heleidae). Mosq. News. 16(4):270-278.

Twinn, C. R.
1931. Note on the biting midge, *Culicoides obsoletus* Mgn., in eastern Canada. Canad. Ent. 63(11):248 p.

Vargas, L.
1949. Lista de los *Culicoides* del Mundo (Diptera,Heleidae). Rev. Soc. mex. Hist. nat. 10(1-4):191-218.

Wirth, W. W.
1952. The Heleidae of California. Univ. Calif. Publs Ent. 9(2):95-266.

Wirth, W. W.
1965. Family Ceratopogonidae (Heleidae). pp. 121-142. *In*: A catalog of the diptera of America north of Mexico. Agricultural Research Service, United States Dept. of Agriculture. 1696 p.

_____. & L. J. Bottimer
1956. A population study of the *Culicoides* midges of the Edwards Plateau Region of Texas. Mosq. News. 16(4):256-266.

E. HORSE FLIES

The entries for horse flies (Tabanidae) include very little biology. Most of the literature on this large and important group is concerned with taxonomy, a lesser amount on distribution, and no disease transmission was recorded.

The synonymy, both at the genus and the species level, is very complex. Several specialists are currently striving to straighten out some of these problems.

In the table are listed 554 species or subspecies, but it is certain that many of these are not valid names.

TABLE I - HORSE FLIES

SPECIES	BREEDING HABITATS, ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ARCHALOMYIA			
magnicalla (Stone)	---, ---; 323	Philip	1947
psammophila (Osten Sacken)	---; ---; 323	Philip	1947
AGRISTROGERUS			
finitimus (Stone)	---; ---; 323	Philip	1965
megerlei (Wiedemann)	---; ---; 323	Philip	1965
ANACIMAS			
doigei (Whitney)	---; April-May; 323	Stone	1938
geropogon Philip	---; ---; 323	Philip	1965
limbellatus Enderlein	---; ---; 323	Philip	1965
APATOLISTES			
actites Philip & Steffan	---; ---; 323	Philip	1965
affinis Philip	---; ---; 323	Philip	1949
aitkeni Philip	---; ---; 323	Philip	1965
albipilosus Brennan	---; ---; 323	Philip	1965
ater Brennan	---; ---; 323	Philip	1965
colei Philip	--; ---; 323	Philip	1965
comastes Williston	---; ---; 62, 323	Philip	1965
comastes comastes Williston	---; April-July; 323	Middlekauff	1950
comastes fulvipes Philip	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
APATOLESTES	---; ---; 62	Philip	1965
comastes			
willistoni Brennan	---; April-June; 323	Middlekauff	1950
hera (Osten Sacken)	---; ---; 323	Brennan	1935
hinei Brennan	---; ---; 323	Philip	1965
parkeri Philip	---; ---; 323	Philip	1965
rossi Philip	---; ---; 323	Philip	1965
similis Brennan	---; ---; 323	Philip	1947
villosulus (Bigot)	---; ---; 323	Philip	1965
ASAPHOMYIA			
texensis Stone	---; ---; 323	Philip	1965
ASSIPALA			
ceras (Townsend)	---; ---; 323	Philip	1965
ATYLOTUS			
bicolor	Sphagnum bog; June-Aug.; 62	Pechuman et al.	1961
	Muddy banks of ponds and streams, wet sod from salt marshes; common in sphagnum bogs, June-Aug., peak July; 323	Pechuman	1957
	Sod a few inches higher than surrounding marsh; ---; 323	MacCreary	1940
duplex Walker	---; June-July; 62	Pechuman et al.	1961
incisuralis (Macquart)	---; ---; 5, 62. ---; May-Aug.; 323	Middlekauff	1950
incisuralis tinguareus (Philip)	---; ---; 5, 62, 323	Philip	1947
incisuralis utahensis (Rowe & Knowlton)	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ATYLOTUS *insuetus* (Osten Sacken)	---; ---; 5, 62. ---; May-Sept.; 323	Stone	1938
ohioensis (Hine)	---; ---; 62	Philip	1965
	Saturated pasture sod and sphagnum bogs; common June-July; 323°	Pechuman	1957
pemeticus (Johnson)	---; June-Aug.; 62	Pechuman et al.	1961
	Sphagnum areas and non-sphagnum marshes; ---; 323	Pechuman	1957
	---; June-Sept.; 323	Stone	1938
pygmaeus (Williston)	---; June-August; 323	MacCreary	1940
thoracicus (Hine)	Sphagnum bog; June-Aug.; 62	Pechuman et al.	1961
	---; common in sphagnum bogs, July-Aug.; 323	Pechuman	1957
	---; salt marsh; 323	MacCreary	1940
	---; June; 323	Stone	1938
tingaureus (Philip)	---; ---; 62, 323	Philip	1965
BOLBODIMYIA *atrata* (Hine)	---; ---; 323	Philip	1965
BRENNANIA *hera* (Osten Sacken)	---; June-Sept.; 323	Middlekauff	1950
hera *fusca* Philip	---; ---; 323	Philip	1965
BUPLEX *tranquilla* Osten Sacken	---; June-August; 62	Winn & Beaulieu	1932
CHLOROTABANUS *crepuscularis* (Bequaert)	---; March-August; 323	Stone	1938
inanis Fabricius	---; ---; 323	Kröber	1929

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
abatus Philip	---; ---; 323	Philip	1965
aberrans Philip	---; June-Sept.; 62	Pechuman et al.	1961
	---; common and annoying in and near the cattail swamps along the lakeshore; 62. Mud on the edges of ponds and streams; June-Sept., peak July-Aug.; 323	Pechuman	1957
aestuans van der Wulp	---; ---; 5	Philip	1965
	---; June-Aug.; 62	Pechuman et al.	1961
	---; Sept.; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	---; ---; 62, 323 (From mud on the edges of temporary and permanent ponds, marshes along the lake and on emergent vegetation often in deep water)	Pechuman	1957
	Banks and margins of temporary and permanent ponds; June-Aug.; 323	Philip	1931
	---; ---; 323°	Frost & Pechuman	1958
aestuans abaestuans Philip	---; ---; 62, 323	Philip	1965
aestuans confusa Kröber	---; ---; 62, 323	Philip	1947
aestuans pseudoconfusus Philip	---; ---; 323	Philip	1965
amazon Daecke	---; June-July; 323	Blickle	1954
amazon amazon Daecke	---; ---; 323	Philip	1965
amazon hubbelli Philip	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *asbestos* Philip	---; ---; 62	Philip	1949
	---; June, July; 323	Middlekauff	1950
atlanticus Pechuman	In very wet situations, often under water, in salt marshes and brackish pools; pest in the vicinity of salt marshes, common; 323°	Pechuman	1957
	---; July-Aug.; 323	Blickle	1954
aurilimba (Stone)	---; ---; 323	Philip	1947
beameri Brennan	---; on vegetation, July-August; 323°	MacCreary	1940
bishoppi Brennan	---; May-July; 323	Middlekauff	1950
bishoppi *gilvus* Philip	---; ---; 323	Philip	1965
bistellatus Daecke	---; June; 323	Fattig	1946
brimleyi Hine	---; attracted to man; 323	MacCreary	1940
	---; March-May; 323	Fattig	1946
	---; June-July; 323	Pechuman	1957
brunneus Hine	Marshes along the lakeshore; attacks with a loud buzzing noise; 62°	Pechuman	1957
	---; June-Aug.; 62	Pechuman et al.	1961
	Marshes; ---; 323	Osburn	1913
	---; April-July; 323	Fattig	1946
	---; August; 323°	MacCreary	1940
callidula Philip	Temporary ponds, marshes with indefinite shore-line, running water; most abundant in the open woodland, less common in other areas, May-Aug.; 323	Knutson et al.	1954
callidus Osten Sacken	---; June-Aug., 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer, in woods)	Winn & Beaulieu	1915

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *callidus* Osten Sacken (cont.)	Stagnant mud on the edge of ponds, creeks, on vegetation; active and aggressive and causes annoyance to man, very common, May-Oct., peak June-July; 323	Pechuman	1957
	Wet organic matter at margins of brackish pools, heavy wet clay soil, floating mat of vegetation, sand tidal flat; bites until dark; 323°	MacCreary	1940
	Temporary pond, marshes with indefinite shoreline, running water; ---; 323	Philip	1931
	Emergent aquatic vegetation; March; 323	Schwardt	1936
	---; open pasture and wooded hillside, peak activity May and June; 323	Schwardt & Hall	1930
	---; April; 323	Jones & Bradley	1924
callidus *confusus* Kröber	---; ---; 62, 323	Philip	1965
carbonarius Walker	---; ---; 5	Brennan	1935
	---; May-July; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in woods)	Winn & Beaulieu	1915
	Mud and plant debris on the edges of ponds and streams, often under several inches of water; common, May-July, peak June; 323	Pechuman	1957
	Lakes of well-defined shoreline; Aug.; 323	Philip	1931
	Mud among dead leaves and sticks often under water; ---; 323	Stone	1930
	---; ---; 323°	Blickle	1954
carbonarius *nubiapex* Philip	---; May-July; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
esler Osten Sacken	---; June, July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer, in woods)	Winn & Beaulieu	1915

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *celer* Osten Sacken (cont.)	Muddy banks of ponds and streams, on emergent vegetation over about eight inches of water; abundant and most annoying to man, May-Aug., peak June; 323°	Pechuman	1957
	Sluggish woodland streams along decaying vegetation; ---; 323	Stone	1939
	---; April; 323	Frost & Pechuman	1958
celer *nigropter* Fairchild	---; ---; 323	Fairchild	1937
celeris Osten Sacken	---; ---; 62, 323	Philip	1947
celeris *nigroptera* Fairchild	---; ---; 323	Philip	1947
cincticornis Walker	---; May-Aug.; 62	Pechuman et al.	1961
cincticornis *cincticornis* Walker	---; ---; 62, 323	Philip	1965
cincticornis *nigropterus* Fairchild	---; ---; 323	Philip	1965
clavicornis Brennan	---; June and July; 323	Middlekauff	1950
clavicornis *brennani* Philip	---; ---; 323	Philip	1965
coloradensis Bigot	---; ---; 62. ---; April-Sept.; 323	Middlekauff	1950
coquillettii Hine	---; May-Aug.; 323	Middlekauff	1950
coquillettii *robustus* Brennan	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS cuclux Whitney	---; May-July; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in woods)	Winn Beaulieu	1915
	Very wet mud of sluggish stream or at margin of artificial ponds; ---; 323	Stone	1930
	---; May-July; 323	Pechuman	1957
cursim Whitney	---; April-July; 323	Brennan	1935
	---; rare, Aug.; 323	Pechuman	1957
dacne Philip	---; June and July; 323	Frost & Pechuman	1958
	---; rare; 323	Pechuman	1957
dawson Philip	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
delicatulus Osten Sacken	---; July-Aug.; 62	Pechuman et al.	1961
	---; occasionally abundant on the coast to be considered a pest, rarely found inland, May-Oct., most common in June and July; 323°	Pechuman	1957
	---; ---; 323	Philip	1965
dimmocki Hine	Very wet humus in cattle marsh soil under sphagnum moss on marsh shore; ---; 323	MacCreary	1940
	---; May-Sept., most common in June-July; 323	Pechuman	1957
	---; ---; 323°	Frost & Pechuman	1958
discalis Williston	Decaying vegetable matter, shores of alkaline lakes; experimental transmission of tularemia; 62°	Cameron	1926
	---; ---; 62	Philip	1965
	---; open salt marshes; 323	Rowe & Knowlton	1936
	---; May-July; 323	Middlekauff	1950

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *discalis* Williston (cont.)	---; Aug.; 323	Brennan	1935
	---; ---; 323*°	Francis	1937
dissimilis Brennan	---; ---; 323	Philip	1965
divisus Walker	---; April-June; 323	Fattig	1946
dorsovittatus Hine	---; April-June; 323	Fattig	1946
excitans Walker	---; ---; 5	Philip	1965
	Lakeshores; ---; 62	Cameron	1926
	---; June-Aug.; 62	Hadwen	1914
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer, in woods)	Winn & Beaulieu	1915
	Mud along the edges of ponds and lakes; pest to man in higher Adirondacks, common; 323°	Pechuman	1957
	Temporary ponds, under debris of lakeshore, edge of sod on sandy beach; ---; 323	Philip	1931
facialis Townsend	---; April, June and July; 323	Philip	1935
fallax Osten Sacken	---; June-July; 62	Winn & Beaulieu	1932
	---; June-July; 323	McAtee & Walton	1913
flavida *flavida* Wiedemann	---; ---; 323	Middlekauff & Quade	1950
flavidus Wiedemann	---; ---; 5	Philip	1950
	---; ---; 62	Philip	1947
	Salt marsh, in salt meadow, floating sod in brackish pond, very wet organic material, in wooded areas; along salt marshes; 323°	MacCreary	1940

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *flavidus* Wiedemann (cont.)	Mud under a foot of water, in very wet situations; Oct.; 323	Pechuman	1957
	Slightly saline inlets and seashore marshes, or fresh water; ---; 323	Osburn	1913
	Lakes with well-marked shoreline; ---; 323	Philip	1931
	Near rice roots, mud banks or stagnant ponds; ---; 323	Schwardt	1936
	---; coastal area; 323	Fairchild	1937
	---; April-Sept.; 323	Fattig	1946
flavidus *celatus* Pechuman	---; June-Sept.; 323	Pechuman	1957
flavidus var. *reicherti* Fairchild	---; Aug. and Sept.; 323	Fattig	1946
frigidus Osten Sacken	Swamps; wooded districts; 62	Cameron	1926
	---; May-Aug.; 62	Pechuman et al.	1961
	---; ---, 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer. in woods)	Winn & Beaulieu	1915
	---; ---; 62 (Bites man freely)	Twinn et al.	1948
	Lake with well-marked shorelines; ---; 323	Philip	1931
	---; common in swampy woods, May-Sept., peak June-July; 323	Pechuman	1957
frigidus *xanthus* Philip	In marsh grass; ---; 323	Philip	1949
	---; July; 323	Blickle	1954
fugax Osten Sacken	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS	---; ---; 62	Philip	1947
fuliginosus Wiedemann	Tidal area, small hummock near poorly drained ditch in vegetation; coastal area; 323°	MacCreary	1940
	Salt marshes including areas which are daily swept by tides; May-Sept.; 323	Pechuman	1957
	---; March-April; 323	Fattig	1946
fulvastra Osten Sacken	---; ---; 62. ---; June-Aug.; 323	Brennan	1935
fulvaster Osten Sacken	Stream banks and swamps; ---; 62	Cameron	1926
	---; salt marshes; 323[c]	Rowe & Knowlton	1936
	---; June and July; 323	Knowlton & Thatcher	1934
fulvistigma Hine	---; May; 323	Jones & Bradley	1924
	---; June; 323	Fattig	1946
fulvistigma var. *dorsopunctus* Fairchild	---; June; 323	Fattig	1946
furcatus Walker	---; ---; 5	Philip	1947
	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 62 (Woodlands, bites man freely)	Twinn et al.	1948
	---; June-August; 323	Brennan	1935
furcatus chagroni Philip	---; ---; 5	Philip	1965
	---; June-July; 62	Pechuman et al.	1961
geminata geminata Wiedemann	---; ---; 323	Hays	1956
geminatus Wiedemann	---; June-Aug.; 62	Pechuman et al.	1961

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS geminatus Wiedemann (cont.)	Wet soil and plant debris along streams, mud under trees; partial to wooded areas, abundant along country roads, June-Aug., peak July; 323	Pechuman	1957
	---; strongly attracted to lights; 323	Frost & Pechuman	1958
geminatus impunctus Kröber	---; ---; 5	Philip	1965
	---; June; 62	Pechuman et al.	1961
	---; April and June; 323	Fattig	1946
	---; July; 323	Frost & Pechuman	1958
hilaris Osten Sacken	---, July; 62	Winn & Beaulieu	1932
	---; ---; 32.	Bequaert & Davis	1923
hinei Daecke	---; common, May, July-Oct.; 323	Pechuman	1957
hirsuticallus Philip	---; April-June; 323	Middlekauff	1950
hungerfordi Brennan	---; ---; 323	Brennan	1935
hyalinus Shannon	---; May and June; 323	Fattig	1946
indus Osten Sacken	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	In mud and plant debris along creeks and edges of ponds, on vegetation over water; most common, aggressive and annoying to man, May-Aug., peak June; 323[a]	Pechuman	1957
	Mud at margins of small pond and backwater pool; ---; 323	Stone	1930

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *lateralis* Wiedemann	---; June-Aug.; 62	Pechuman et al.	1961
	In mountainous and hilly areas; very annoying pest of man, June-Aug., peak June-July; 323°	Pechuman	1957
latifrons Brennan	---; ---; 323	Philip	1965
lugens Wiedemann	---; May and July-Sept.; 323	Fattig	1946
	---; June; 323	McAtee & Walton	1918
lugens var. *morosa* Osten Sacken	---; ---; 323	Bequaert & Davis	1923
lupus Whitney	---; ---; 5, 62	Hine	1923
	---; June-July; 323	Philip	1931
luteopennis Philip	---; ---; 323	Philip	1965
macquarti Philip	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
mitis Osten Sacken	---; ---; 5	Philip	1965
	Around slough; ---; 62°	Cameron	1926
	---; May-July; 62	Brennan	1935
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Edges of ponds and in swampy areas; May-July, peak June; 323°	Pechuman	1957
	Temporary pond and lakeshores; in and about woods; 323	Philip	1931
moechus Osten Sacken	Leaves of trees overhanging rivers and streams; June-Aug.; 62	Pechuman et al.	1961
	Wet mud, under water along ponds and streams, amongst leaves of trees overhanging streams; bites man late in the afternoon until after dark; 323°	Pechuman	1957

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS *moechus* Osten Sacken (cont.)	At margin of artificial lake and muddy backwater; ---; 323	Stone	1930
	Lakes; ---; 323	Philip	1931
	---; May-August; 323	McAtee & Walton	1918
moerens Walker	---; ---; 62°	Cameron	1926
	On leaves, aquatic plants oftentimes standing in rather deep waters as much as 20 rods from shore, around edges of grassy areas; common in marshes, June-Sept.; 323	Hine	1906
montanus Osten Sacken	---; May; 62	Winn & Beaulieu	1932
	---; June-Aug.; 62	Pechuman et al.	1961
	Sand on the edges of ponds and lakes; abundant and aggressive; 323	Pechuman	1957
	Lakeshore; woods, June-Sept.; 323	Philip	1931
	---; vicinity of lakes and ponds; 323	Stone	1930
	---; May; 323	Fattig	1946
	---; ---; 323°	Frost & Pechuman	1958
montanus *perplexus* Philip	---; ---; 323	Philip	1965
niger Macquart	---; May-July; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Wet mud usually at unshaded places, boggy meadow-fed by springs, margin of swamp, creek bank; May-Aug.; 323°	Stone	1930
	Marshes, running water; ---; 323	Philip	1931
	---; wooded pasture, peak in June; 323	Schwardt & Hall	1930

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
niger taylori Philip	---; ---; 323	Philip	1965
nigra Macquart	---; ---; 62. ---; taken at light; 323	Frost & Pechuman	1958
	Stagnant mud and plant debris on the edge of a pool, banks of small brook, wet soil under trees, margin of brackish water and in sandy areas swept by daily tides; sometimes abundant and annoying to man, May-Sept.; 323°	Pechuman	1957
	Sandy tidal region with much vegetation, margin of slightly brackish pool; occasionally in buildings; 323	MacCreary	1940
	---; April; 323	Fattig	1946
nigribimbo Whitney	---; May-Aug.; 323	Brennan	1935
	---; rare; 323	Pechuman	1957
nigripes Zetterstedt	---; ---; 5, 323	Philip	1965
	---; July-Aug.; 62 (Woodland, bites man freely)	Twinn et al.	1948
noctifer Osten Sacken	---; Apr.-Aug.; 62	Hadwen	1914
	---; experimental transmission of *Bacterium tularense*; 323	Parker	1934
	---; mountain areas; 323	Rowe & Knowlton	1936
noctifera noctifera Osten Sacken	---; May-July; 323	Middlekauff	1950
noctifera permax Williston	---; ---; 62. ---; May-July; 323	Middlekauff	1950
obsoletus Wiedemann	---; July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Wet organic matter, soft mud in marsh; on vegetations, marshes and inland; 323°	MacCreary	1940
	Mud beside shallow, slowly-flowing brook; May-October, peak in June; 323	Jones & Bradley	1924
	---; wooded pastures and wooded hillside, peak June and July; 323	Schwardt & Hall	1930
	---; greatest abundance in summer months; 323	Jones & Bradley	1923

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
obsoletus lugens Wiedemann	---; ---; 323	Philip	1965
ornata Kröber	---; ---; 62	Philip	1947
pachycera dilata Rowe & Knowlton	---; ---; 323	Philip	1947
pachycera pachycera Williston	---; June; 323	Middlekauff	1950
pachycerus Williston	---; ---; 323	Philip	1965
pachycerus hungerfordi Brennan	---; ---; 323	Philip	1965
parvulus Daecke	Pine barrens; ---; 323	Pechuman	1957
	---; wooded pasture, orchards, peak activity July; 323°	Schwardt & Hall	1930
	---; May-June and Aug.-Sept.; 323	Fattig	1946
pechumani Philip	---; May and June; 323	Middlekauff	1950
pertinax Williston	---; May-June; 62. ---; June-Aug.; 323	Brennan	1935
pikei Whitney	---; June, July; 62	Pechuman et al.	1961
	Bank of slow brook, border of stagnant pond; ---; 323	Schwardt	1936
	---; open and wooded pastures, lowlands. 323	Schwardt & Hall	1930
	---; August-Oct., peak April; 323	Jones & Bradley	1924
	---; peak May and June; 323	Jones & Bradley	1923
plangens Wiedemann	---; common; 323°	Bequaert & Davis	1923
	---; ---; 323	Osburn	1913

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
proclivis atricornis Bigot	---; ---; 62, 323	Philip	1965
proclivis var. *piceus* Philip	---; July; 323	Philip	1935
proclivis proclivis Osten Sacken	---; ---; 62. ---; June-Aug.; 323	Middlekauff	1950
proclivus Osten Sacken	---; common in coniferous woods; 62	Cameron	1926
	---; May-July; 62	Hadwen	1914
	---; June-Aug.; 323	Brennan	1935
proclivus imfurcatus Philip	---; ---; 62. ---; June and July; 323	Middlekauff	1950
	---; May and Aug.; 323	Philip	1935
proclivus aurda Osten Sacken	---; ---; 62, 323	Philip	1947
pudicus Osten Sacken	---; common along the coast, April-Sept., peak June-July; 323	Pechuman	1957
reicherti Fairchild	---; ---; 323	Fairchild	1937
robusta Brennan	---; ---; 323	Philip	1947
sackeni Hine	---; June-July; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	In mud on the edges of permanent and temporary ponds and in organic material on the edge of salt marshes; June-Aug.; 323[e]	Pechuman	1957
	Temporary pond, marshes with indefinite shore line, pasture; ---: 323	Philip	1931
separatus Hine	---; April; 323	Jones & Bradley	1924

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS	---; May; 323	Fattig	1946
sequax Williston	---; June-Aug.; 323	Schwardt	1936
	---; Sept.; 323	Brennan	1935
sequax tau Philip	---; ---; 323	Philip	1965
shermani Hine	---; June-July; 62	Pechuman et al.	1961
	---; aggressive and bites with a loud buzzing sound, June-Sept., peak June-July; 323°	Pechuman	1957
sordidus Osten Sacken	---; June-July; 62	Pechuman et al.	1961
	---; June-August; 323	Pechuman	1957
	---; ---; 323°	Blickle	1954
striatus Osten Sacken	---; June-August; 62	Winn & Beaulieu	1932
	Mud on the edge of ponds and in sandy soil swept by tides, common in the cattail swamps; ---; 323	Pechuman	1957
	Along reedy shoreline of pond; ---; 323	Philip	1931
	---; June-Sept.; 323	Brennan	1935
	---; ---; 323°	Blickle	1954
surdus Osten Sacken	---; ---; 62	Philip	1965
	---; June-Aug.; 323	Middlekauff	1950
surdus pleeus Philip	---; ---; 323	Philip	1965
tidwelli Philip & Jones	---; ---; 323	Philip	1965
ultima Whitney	---; July-Aug.; 323	Brennan	1935
unifottatus Macquart	---; June-Aug.; 62	Pechuman et al.	1961
	Mud and plant debris from the edges of ponds and streams; pest of man during its flight season, peak June-July; 323°	Pechuman	1957
	---; May-Sept.; 323	Blickle	1954

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
upsilon Philip	---; ---; 323	Philip	1965
venus Philip	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
virgulatus Bellardi	---; ---; 323	Philip	1965
vitripennis Shannon	---; bogs, grass and vegetation a few inches above water surface; 323	McAtee & Walton	1918
vittatus Wiedemann	---; June-Sept.; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Wet soil and plant debris from edges of streams, ponds and lakes, also from saturated soil under trees; abundant in low-lying wooded areas, peak July-Aug.; 323°	Pechuman	1957
	Temporary pond, running water; ---; 323	Philip	1931
	---; April-October, peak in June and September; 323	Jones & Bradley	1924
vittata boridana Johnson	---; ---; 323	Fairchild	1937
vittatus floridanus Johnson	---; ---; 323	Philip	1965
wiedemanni Kröber	---; ---; 62. Muddy banks of streams; woodland; 323	Stone	1930
	Wet soil and plant debris on the edges of both sluggish and swift streams, in mud at the edge of ponds and lakes and in marshes; partial to wooded areas, quiet and attack man preferably behind the ear and on the cheeks, May-Sept., peak July-Aug.; 323°	Pechuman	1957
	Banks of stagnant or spring-fed ponds and small slow streams; ---; 323	Schwardt	1936
	Running water, pastures; ---; 323	Philip	1931
	---; strongly attracted to light; 323	Frost & Pechuman	1958

TABLE 1 HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHRYSOPS			
sinuatus Philip	---; ---; 62	Philip	1965
CHRYSOPSINA			
americana (Osten Sacken)	---; ---; 5, 62, 323	Philip	1947
champlaini Philip	---; June; 323	Frost & Pechuman	1958
punctulata (Macquart)	---; ---; 323	Philip	1947
rara (Johnson)	---; occasionally taken at light, June; 323	Frost & Pechuman	1958
	---; rare; 323	Pechuman	1957
shillistoni Philip	---; May; 323	Philip	1953
DASYOMMIA	---; ---; 323	Kröber	1929
cincta Fabricius	---; ---; 351	Kröber	1934
DIACHLORUS			
badius Kröber	---; ---; 323	Kröber	1934
ferrugatus (Fabricius)	---; March-Nov.; 323	Stone	1938
	---; ---; 323°	MacCreary	1940
	---; ---; 351	Kröber	1934
DICLADOCERA			
annularis (Hine)	---; April-May; 323	Stone	1938
finitima Stone	---; ---; 323	Stone	1938
megerlei (Wiedemann)	---; March; 323	Stone	1938
	---; April and June; 323	Fattig	1946
scita (Walker)	---; May-July; 323	Stone	1938
sexfasciata Stone	---; ---; 323	Fairchild	1937
ESENBECKIA			
delta (Hine)	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PSEUDBECKIA			
incisuralis (Say)	---; ---; 323	Philip	1965
incisuralis tinkhami Philip	---; ---; 323	Philip	1965
micheneri Philip	---; ---: 323	Philip	1965
CHRYSOPS			
daedalus (Stone)	---; ---; 323	Philip	1947
fraxella (Williston)	---; ---; 5, 62. ---; July and Aug.; 323	Middlekauff	1950
GONIOPS	---; ---: 62	Philip	1965
chrysocoma (Osten Sacken)	In lower layers of deep leaf mould and in damp soil; ---; 323	Pechuman	1957
	---; taken at light, May-Aug.; 323	Frost & Pechuman	1958
HAEMATOPOTA	---; ---; 5. ---; June-August; 323	Stone	1938
americana Osten Sacken	Banks of sloughs; ---; 62[6]	Cameron	1926
	---; June-August; 62	Pechuman et al.	1961
champlaini (Philip)	---; ---; 323	Philip	1965
pluvialis Macquart	---; May and June; 323	Fattig	1946
rara Johnson	---; June; 323	Stone	1938
williston (Philip)	---; ---; 323	Philip	1965
HAMATABANUS			
annulorie Hine	---; ---; 323	Philip	1965
carolinensis (Macquart)	---; ---; 323	Philip	1965
zeitus (Walker)	---; ---; 323	Philip	1947

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HAEMATABANUS			
bezfasciatus (Stone)	---; ---; 323	Philip	1965
vicinus Macquart	---; ---; 323	Philip	1965
HYBOMITRA			
actos Philip	---; ---; 323	Philip	1965
acquetineta (Becker)	---; ---; 62, 323	Philip	1947
affinis (Kirby)	Woodlands; active after sunrise, indoors, bites man in streams, July-Aug.; 62°	Twinn et al.	1948
	---; June; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
affinis aurilimba (Stone)	---; woodland clearings, June-July; 62	Pechuman et al.	1961
arpadi (Szilady)	---; ---; 5, 323	Philip	1965
	---; woodland clearings, June-July; 62	Pechuman et al.	1961
astuta (Osten Sacken)	---; ---; 5, 323	Philip	1965
	Sphagnum bogs; July; 62	Pechuman et al.	1961
atrobasis (McDunnough)	---; ---; 62, 323	Philip	1965
aurilimbus (Stone)	---; ---; 62, 323	Philip	1965
boreus (Stone)	---; ---; 5	Philip	1947
brennani (Stone)	---; ---; 62, 323	Philip	1965
californica (Marten)	---; ---; 62. ---; June, July and Sept.; 323	Middlekauff	1950
capronis (Marten)	---; ---; 62. ---; June, July and Sept.; 323	Middlekauff	1950

TABLE 3 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYBOMITRA			
carolinensis (Macquart)	---; ---; 323	Philip	1947
cinerea (Fabricius)	---; woodland clearings, July; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1947
criddlei (Brooks)	---; woodland clearings. June-August; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
daecke (Hine)	---; ---; 323	Philip	1965
difficilis (Wiedemann)	---; ---; 323	Philip	1965
epistater (Osten Sacken)	---; ---; 5, 323	Philip	1965
	---; June-August; 62	Pechuman et al.	1961
	---; woodland clearings; 351	Bailey	1949
frenchii (Marten)	---; ---; 323	Philip	1947
freta (Stone)	---; ---; 323	Philip	1947
frontalis (Walker)	---; ---; 5, 323	Philip	1965
	---; June-August; 62	Pechuman et al.	1961
frontalis frontalis (Walker)	---; ---; 323	Hays	1958
frontalis septentrionalis (Loew)	---; ---; 62	Pechuman et al.	1961
frosti Pechuman	---; ---; 5, 323	Philip	1965
	---; July-Aug.; 62	Pechuman et al.	1961
fulvilateralis (Macquart)	---; ---; 62, 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYBOMITRA	---; ---; 5, 323	Philip	1947
gracilipalpis (Hine)	---; ---; 62	Twinn et al.	1948
haemophora (Marten)	---; ---; 62. ---; June-Aug.; 323	Middlekauff	1950
hearlei (Philip)	---; June-July; 62	Pechuman et al.	1961
hirei (Johnson)	---; ---; 62, 323	Philip	1947
hinei hinei (Johnson)	---; ---; 323	Philip	1965
hinei wrighti (Whitney)	---; ---; 323	Philip	1965
illota (Osten Sacken)	---; ---; 5, 323	Philip	1965
	---; May-Aug.; 62	Pechuman et al.	1961
itasca (Philip)	---; ---; 5, 62, 323	Philip	1965
labradorensis (Enderlein)	---; ---; 62	Philip	1947
lanifera (McDunnough)	---; ---; 5, 62, 323	Philip	196[illegible]
laeiophthalma (Macquart)	---; ---; 5, 323	Philip	1965
	Vegetation growing under damp, semi-swamp conditions; woodland clearings, May-August; 62	Pechuman et al.	1961
	---; woodland clearings; 351	Bailey	1949
laticallus (Philip)	---; ---; 323	Philip	1965
latiornis (Hine)	---; ---; 323	Philip	1965
liorhina (Philip)	---; ---; 5	Philip	1950
	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYBOMITRA *longiglossa* (Philip)	---; June; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
melanorhina (Bigot)	---; ---; 62. ---; June and July; 323	Middlekauff	1950
metabola (McDunnough)	---; ---; 5, 323	Philip	1965
	---; May-July; 62	Pechuman et al.	1961
microcephala (Osten Sacken)	---; July-Sept.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
minuscula (Hine)	Sphagnum bog; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
nigriceps (Wiedemann)	---; ---; 323	Philip	1965
nuda (McDunnough)	---; ---; 5, 323	Philip	1965
	---; May-July; 62	Pechuman et al.	1961
oklahomensis (Stone)	---; ---; 323	Philip	1947
opaca (Coquillett)	---; ---; 62. ---; June and July; 323	Middlekauff	1950
pedionis (McAlpine)	---; ---; 62, 323	Philip	1965
philipi (Stone)	---; ---; 62, 323	Philip	1965
polamis (Say)	---; ---; 5	Philip	1965
[illegible]pon (Osten Sacken)	---; ---; 62. ---; March-July; 323	Middlekauff	1950
rhombica (Osten Sacken)	---; ---; 5, 62	Philip	1965
	---; June and July; 323	Middlekauff	1950
rhombica osburni (Hine)	---; ---; 5, 62, 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYBOMITRA			
rupestris (McDunnough)	---; ---; 62, 323	Philip	1965
septentrionalis (Loew)	---; ---; 5, 323	Philip	1947
	---; July-Aug.; 62	Twin- et l	.948
septentrionalis frontalis Walker	---; ---; 62	Phi.	1947
sequax (Williston)	---; ---; 62, 323	Philip	1965
sexfasciata (Hine)	---; ---; 5, 62	Philip	1965
sonomensis (Osten Sacken)	---; ---; 5, 323	Philip	1965
sonomensis phaenops (Osten Sacken)	---; ---; 62. ---; April-Aug.; 323	Middlekauff	1950
sonomensis sonomensis (Osten Sacken)	---; ---; 5, 62. ---; April-Aug.; 323	Middlekauff	1950
susurra (Marten)	---; ---; 323	Philip	1947
tetrica (Marten)	---; June; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
tetrica hirtula (Bigot)	---; ---: 62. ---; June and July; 323	Middlekauff	1950
tetrica rubrilarus (Philip)	---; ---: 323	Philip	1947
tetrica tetrica (Marten)	---; ---; 62. ---; June and July; 323	Middlekauff	1950
trepida (McDunnough)	---; ---; 5, 323	Philip	196
	---; June-August; 62	Pechuman et al.	1961
trispila (Wiedemann)	---; ---; 62, 323	Philip	1947

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYBOMITRA	---; June-August; 62	Pechuman	
crespila		et al.	1961
sodalis			
(Williston)	---; in mountains; 323	Philip	1965
trispila			
trispila	---; ---; 323	Philip	1965
(Wiedemann)			
typhus	---; ---; 5, 323	Philip	1965
(Whitney)			
	---; June-Aug.; 62	Pechuman	
		et al.	1961
zonalis	---; June-July; 62	Pechuman	
(Kirby)		et al.	1961
	---; ---; 323	Philip	1965
zygota	---; ---; 62, 323	Philip	1965
(Philip)			
LEUCOTABANUS			
ambiguus	---; ---; 323	Philip	1965
Stone			
annulatus	---; May-July; 323	Stone	1938
(Say)			
leucaspis	---; ---; 323	Kröber	1929
Wiedemann			
MERICOMIA			
brunnea	---; ---; 323	Philip	1965
Stone			
mixta	---; June and July; 323	Fattig	1946
Hine			
whitneyi	---; Aug.; 62	Pechuman	
(Johnson)		et al.	1961
	---; ---; 323	Philip	1965
MICROTABANUS			
pygmaeus	---; ---; 323	Philip	1965
(Williston)			
NEOCHRYSOPS			
globosa	---; ---; 323	Brennan	1935
Walton			
globosus	---; ---; 323	Philip	1965
Walton			

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
OSCA			
californica (Bigot)	---; ---; 323	Rowe & Knowlton	1936
PANGONIA			
dives Williston	---; ---; 323	Knowlton & Thatcher	1934
fera Williston	---, July; 62	Hachen	1914
pigra Osten Sacken	---; ---; 323	McAtee & Walton	1918
vasa Loew	---; ---; 323	McAtee & Walton	1918
tranquilla Osten Sacken	---; ---; 323 (Leaves of aquatic plants, predaceous. bites in the woods and swamps or upon the lake)	Metcalf	1932
PILIMAS			
aburcus (Philip)	---; ---; 323	Philip	1965
beameri Philip	---; ---; 323	Philip	1947
californicus (Bigot)	---; ---; 62. ---; June-Aug.; 323	Middlebrauff	1950
californicus beameri Philip	---; ---; 323	Philip	1965
ruficornis (Bigot)	---; ---; 323	Philip	1965
RICARDOA			
latiflagrum Enderlein	---; ---; 323	Kröber	1934
nigronotata Macquart	---; ---; 351	Kröber	1934
SILVIUS			
adorinalis Philip	---; ---; 323	Philip	1965
cerus (Townsend)	---; ---; 323	Philip	1965
gigantulus (Loew)	---; July-Aug.; 62. ---; May-Aug.; 323	Brennan	1935
laticallus Brennan	---; ---; 323	Brennan	1935

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SILVIUS			
microcephalus Wehr	---; ---; 323	Philip	1965
notatus (Bigot)	--- , March, May-Sept.; 323	Middlekauff	1950
philipi Pechuman	---; ---; 323	Philip	1965
pollinosus Williston	---; June-Sept.; 323	Brennan	1935
pollinosus jeanae Pechuman	---; ---; 323	Philip	1965
pollinosus pollinosus Williston	---; ---; 323	Philip	1965
quadrivittatus (Say)	---; May; 323	Middlekauff	1950
	---; June-Aug.; 323	Brennan	1935
quadrivittatus texanus Pechuman	---; ---; 323	Philip	1965
sayi Brennan	---; ---; 323	Philip	1965
STENOTABANUS			
cribellum (Osten Sacken)	---; ---; 323	Stone	1938
daedalus Stone	---; Aug. and Sept.; 323	Fattig	1946
flavidus (Hine)	---; ---; 323	Philip	1965
floridensis (Hine)	---; May; 323	Fattig	1946
guttatulus (Townsend)	---; ---; 323	Philip	1965
magnicallus (Stone)	---; May-Aug.; 323	Stone	1938
productus (Hine)	---; May-Sept.; 323	Stone	1938
psammophilus (Osten Sacken)	---; Jan.-April; 323	Stone	1938
	---; June; 323	Fattig	1946

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
STIBASOMA			
fulvohirtum Wiedemann	---; ---; 323	Kröber	1934
STONEMYIA			
abaurous Philip	---; May-Aug.; 323	Middlekauff	1950
californica (Bigot)	---; ---; 323	Brennan	1935
fera (Williston)	---; ---; 62. ---; July, 323	Brennan	1935
isabellina (Wiedemann)	---; June and July; 323	Frost & Pechuman	1958
jonesi (Cresson)	---; ---; 323	Brennan	1935
pigra (Osten Sacken)	---; June-July; 323	Brennan	1935
rasa (Loew)	---; July-Aug.; 62	Pechuman et al.	1961
	---; June-Aug.; 323	Brennan	1935
	---; Sept.; 323	Pechuman	1957
ruficornis (Bigot)	---; ---; 323	Philip	1947
tranquilla (Osten Sacken)	---; June-Aug.; 62	Pechuman et al.	1961
	---; May and June; 323	Fattig	1946
	---; July-Aug.; 323	Pechuman	1957
tranquilla fera (Williston)	---; ---; 62	Philip	1965
	---; June-Aug.; 323	Middlekauff	1950
tranquilla tranquilla (Osten Sacken)	---; ---; 62, 323	Philip	1965
velutina (Bigot)	---; ---; 323	Philip	1965
SILAEDINUS			
lasiophthalmus Macquart	---; ---; 351	Kröber	1934

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
aar Philip	---; June-Aug.; 323	Fattig	1946
aasa Philip	---; ---; 62, 323	Philip	1965
abactor Philip	---; May-Oct.; 323	Stone	1938
abditus Philip	---; ---; 323	Philip	1965
abdominalis Fabricius	---; June-October; 323	Jones & Bradley	1923
actaeon Osten Sacken	---; ---; 62. ---; July-Sept.; 323	Stone	1938
acutus (Bigot)	---; May-Aug.; 323	Stone	1938
aegrotus Osten Sacken	---; July; 62	Hadwen	1914
	---; June-Sept.; 323	Middlekauff	1950
aequalis Hine	---; May-July, peak in June; 323	Jones & Bradley	1924
aequetinctus Becker	---; June-Sept.; 62. ---; ---; 351	Stone	1938
affinis Kirby	---; ---; 5	Stone	1938
	---; June, July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	---; rare; 62	McDunnough	1921
	---; ---; 62°	Miller	1951
	---; June-Aug.; 323	Philip	1931
	---; ---; 323 (Leaves of aquatic plants, standing above or floating on water surfaces, predaceous, bites in the woods and swamps or on the lakes)	Metcalf	1932
affinis aurilimbus Stone	---; hovering on hill tops and in openings in areas, July; 323	Pechuman	1957

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *americanus* Forster	---; July; 62	Pechuman et al.	1961
	Muddy edge of stagnant water with surrounding vegetation; ---; 323	Jones & Bradley	1924
	---; wooded hillside; 323	Schwardt & Hall	1930
	---; March-August; 323	Stone	1938
amplifrons Kröber	---; ---; 323	Philip	1947
annulatus Say	Rotten logs; ---; 323	Jones & Bradley	1923
	---; wooded pasture; 323	Schwardt & Hall	1930
	---; May-August; 323	Jones & Bradley	1924
aranti Hays	---; ---; 323	Philip	1965
astutus Osten Sacken	---; May-July; 62	Winn & Beaulieu	1932
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	---; June and July; 323	Philip	1931
	---; Aug.; 323	Pechuman	1957
	---; ---; 323 (On brush about wooded areas, on grasses and sedges of swamps and margins, pools and lake margins, bites man)	Metcalf	1932
atratus Fabricius	---; June-August; 62	Pechuman et al.	1961
	Wet material in cattail marsh, wet soil, few inches from waterline of brackish pool, loam from base of pine stump, in *Typha* marsh; in buildings, on vegetation and sand dunes; 323	MacCreary	1940
	Mud near small streams or ponds, floating algae in irrigation canals, under moss on stones, rotting logs, recently drained rice fields; ---; 323	Schwardt	1936
	Plant stem on salt meadow near bridge, protruding from wet ground; ---; 323	Bequaert & Davis	1933

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *atratus* Fabricius (cont.)	Temporary ponds, running water; ---; 323	Philip	1931
	---; open and wooded pastures; 323	Schwardt & Hall	1930
	---; attracted to light; 323	Frost & Pechuman	1958
	---; all year, peak midsummer; 323	Pechuman	1957
	---; ---; 351	Kröber	1934
atratus *fulvopilosus* Johnson	---; coastal regions; 323	MacCreary	1940
	---; March-Sept.; 323	Stone	1938
atratus *nantucketensis* Hine	Mats of plant debris in salt marshes; May-Sept.; 323	Pechuman	1957
atrobasis McDunnough	---; May; 62. ---; ---; 323	McDunnough	1921
aurilimbus Stone	---; June-Aug.; 323	Blickle	1954
benedictus Whitney	Mud along edge of shallow, stagnant water; June-September, peak August; 323	Jones & Bradley	1924
	Leaf on elm seedling, underside of bladderwort; mud at border of swamp; ---; 323	Schwardt	1936
	---; open pastures, wooded hillside; 323	Schwardt & Hall	1930
bicolor Wiedemann	---; May, July; 62	Winn & Beauchien	1932
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beauchien	1915
	Temporary pond, running water; June-Aug.; 323	Philip	1931
	Muddy bank of stream or pond; ---; 323	Stone	1930
	---; May; 323	Fattig	1946
birdei Whitney	---; March-April; 323	Stone	1938
bishoppi Stone	---; March-May; 323	Stone	1938
	---; June; 323	Fattig	1946

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
bebarti Philip	---; ---; 323	Philip	1965
boreus Stone	---; ---; 5	Stone	1938
brennani Stone	---; July; 323	Blickle	1954
calens Linnaeus	---; August; 62	Pechuman et al.	1961
	---; attracted to light, July-Sept.; 323	Frost & Pechuman	1958
californicus Marten	---; ---; 62, 323	Stone	1938
captonis Marten	---; June-Aug.; 62	Hadwen	1914
	---; common; 62	McDunnough	1921
	---; June-Aug.; 323	Stone	1938
carolinensis Macquart	---; April-July; 323	Stone	1938
catenatus Walker	---; July-August; 62	Pechuman et al.	1961
	---; June-Sept.; 323	Stone	1938
	---; strongly attracted to light, Oct.; 323	Frost & Pechuman	1958
cayensis Fairchild	---; ---; 323	Philip	1965
centron Marten	---; ---; 323	Rowe & Knowlton	1935
centror Mark.	---; ---; 323	Knowlton & Thatcher	1934
cheliopterus Rondani	---; May-Sept.; 323	Stone	1938
cheliopterus fronto Osten Sacken	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
chrysopterus subfronto Philip	---; ---; 323	Philip	1947
cinctus Fabricius	---; July; 62	Winn & Beaulieu	1932
	---, May-Aug.; 323	Frost & Pechuman	1958
coarctatus Stone	---; April-June; 323	Stone	1938
coffeatus Macquart	---; June; 62	Winn & Beaulieu	1932
	Heavy growth of vegetation, in hummock; coastal areas; 323	MacCreary	1940
	Banks of spring-fed pond; ---; 323	Schwardt	1936
	---; open and wooded pasture; 323	Schwardt & Hall	1930
	---; April-June, Aug.-Oct.; 323	Fattig	1946
	---; May-September; 323	Stone	1938
colombensis Macquart	---; ---: 323	Philip	1965
conterminus Walker	---; May and June; 323	Fattig	1946
costalis Wiedemann	---; open and wooded pasture, wooded hillside, May-Oct., peak June-Sept.; 323	Schwardt & Hall	1930
	---; ricefields; 323	Schwardt	1936
	---; common April; 323	Jones & Bradley	1923
crepuscularis Bequaert	---; ---; 323	Fairchild	1937
	---; ---; 351	Kröber	1934
cribellum (Osten Sacken)	---; ---; 323	Philip	1947
cymatophorus Osten Sacken	---; June; 62	Winn & Beaulieu	1932
	Mud at borders of stagnant or flowing water; ---; 323	Schwardt	1936

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *cymatophorus* Osten Sacken (cont.)	Mud at edge of small, shallow, stagnant pool; ---; 323	Jones & Bradley	1936
	---; June-Oct.; 323	Stone	1938
	---; ---; 351	Kröber	1934
daeckei Hine	---; salt marshes, buildings, vegetation, coastal areas, May-July; 323	MacCreary	1940
dawsoni	---; active July; 323	Philip	1931
dietrichi Pechuman	---; ---; 323	Philip	1965
difficilis Wiedemann	---; bites man indiscriminately; 323°	Pechuman	1957
	---; often very numerous, April-Aug.; 323°	Frost & Pechuman	1958
doigei Whitney	---; June; 62	Winn & Beaulieu	1937
	---; ---; 323	Wehr	1922
dorsifer Walker	---; May-Oct.; 323	Stone	1938
eadsi Philip	---; ---; 323	Philip	1955
endymion Osten Sacken	---; May-Sept.; 323	Stone	1938
	---; Oct.; 323	Fattig	1946
epistates Osten Sacken	---; ---; 5	Stone	1938
	---; June, July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-in woods)	Winn & Beaulieu	1915
	---; common; 62	McDunnough	1921
	Temporary pond, lakes with well-marked shoreline; ---; 323	Philip	1931
	---; May-Aug., most common in June-July; 323	Pechuman	1957
equalis Hine	---; May-July, peak June; 323	Jones & Bradley	1924
erythraeus (Bigot)	---; ---; 323	Philip	1965
eurycerus Philip	---; June-Aug.; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
exilipalpis Stone	---; ---; 323	Philip	1947
exul Osten Sacken	---; September; 323	Jones & Bradley	1924
fairchildi Stone	---; July-August; 62	Pechuman et al.	1961
	Muddy edge of the stream, under stone, in swift water; June-Aug., peak June; 323	Pechuman	1957
flavipes Wiedemann	---; July; 62	Winn & Beaulieu	1932
flavus Macquart	---; June; 323	Mosier & Snyder	1919
floridanus Szilády	---; ---; 323	Krober	1934
floridensis Hine	---; ---; 323	Philip	1947
fratellus Williston	---; ---; 5, 323	Philip	1965
	---; July-Aug.; 62	Stone	1938
fretus Stone	---; ---; 323	Stone	1938
frontalis Walker	---; ---; 62. ---; June-Sept.; 323	Stone	1938
frontalis septentrionalis Loew	---; ---; 5	Weber	1950
	---; ---; 62. ---; June-Aug.; 323	Pechuman	1957
fronto Osten Sacken	---; ---; 323	Fairchild	1937
fronto var. *subfronto* Philip	---; July and Aug.; 323	Fattig	1946
fulvicallus Philip	---; June-July; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *fulvulus* Wiedemann	Rotten log; ---; 323	Jones & Bradley	1923
	---; on peach foliage, July-August; 323	MacCreary	1940
	---; strongly attracted to light; 323*	Frost & Fechuman	1958
	---; May; 323	Jones & Bradley	1924
fulvulus pallidescens Philip	---; May-July; 323	Stone	1938
fumipennis Wiedemann	---; May-Aug.; 323	Stone	1938
fuscostatus Hine	---; May-August, peak in June; 323	Jones & Bradley	1924
fuscomemosus Macquart	---; ---; 323	Philip	1965
fuscopunctatus Macquart	Mud bottom of a brook; ---; 323	Jones & Bradley	1923
giganteus DeGeer	---; July-Oct.; 323	Stone	1938
gilanus Townsend	---; June-Aug.; 323	Stone	1938
gladiator Stone	---; June-Sept.; 323	Stone	1938
gracilipalpis Hine	---; ---; 5. ---; June-July; 62	Stone	1938
gracilis Wiedemann	---; May-Dec.; 323	Stone	1938
haemaphorus Marten	---; May-June, common; 62. ---; ---; 323	McDunnough	1921
	---; Aug.; 62	Stone	1938
haematophora McDunnough	---; ---; 323	Knowlton & Thatcher	1934
hearlei Philip	---; ---; 62	Stone	1938

TABLE 3 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS: ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS	---; ---; 62. ---; June-Aug.; 323 (Coastal form)	Pechuman	1957
hinei Johnson	---; attracted to light; 323°	Frost & Pechuman	1958
	---; May; 323	Stone	1938
hinei wrighti Whitney	---; May-June; 323	Stone	1936
hirtiocculatus Macquart	---; ---; 323	McAtee & Walton	1918
hirtulus (Bigot)	---; May-July; 62	Hadwen	1914
	---; June-Aug.; 323	Stone	1938
illotus Osten Sacken	---; ---; 5	Stone	1938
	---; open country; 62	Cameron	1926
	Under debris and in moist earth on the edges of ponds and swamps; very aggressive, abundant along the shores, May-Aug., peak June; 323°	Pechuman	1957
	Temporary and permanent pond, margin of artificial body of waste water; ---, 323	Philip	1931
imitans Walker	Mud at edges of small pool; ---; 323	Jones & Bradley	1923
	---; March-June; 323	Stone	1938
imitans excessus Stone	---; May; 323	Stone	1938
imitans peshmani Philip	---; ---; 323	Philip	1965
inanus Fabricius	---; ---; 351	Kröber	1934
insuetus Osten Sacken	---; July; 62	Hadwen	1914
	---; ---; 62°	Cameron	1926
	---; ---; 323	Webb & Wells	1924
insuetus var. *tingaureus* Philip	---; Aug.; 323	Philip	1936

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
intensivus Townsend	---; June-Aug.; 323	Stone	1938
itacea Philip	---; July and Aug.; 323	Philip	1936
johnsoni Hine	---; May-Sept.; 323	Stone	1938
kesseli Philip	---; ---; 62. ---; June and July; 323	Middlekauff	1950
kisliuki Stone	---; ---; 323	Philip	1965
labradorensis Stone	---; ---, 62	Winn & Beaulieu	1932
lacustris Stone	---; May-Aug.; 323	Fattig	1946
laniferus McDunnough	---; ---; 5, 323. ---; June-Sept.; 62	Stone	1938
	---; common in mountains; 62	McDunnough	1922
lasiophthalmus Macquart	Swamp; ---; 62	Cameron	1926
	---; June, July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Moist and wet sod; May-Aug., peak June; 323	Pechuman	1957
	Underneath the bark of tree; ---; 323	Bequaert & Davis	1923
	Grass in moist pasture; ---; 323	Schwardt	1936
	Bogs, grassy hollow; ---; 323	Philip	1931
	Saturated soil; ---; 323	Tashiro & Schwardt	1949
	---; attracted to light, common; 323	Frost & Pechuman	1958
	---; inland species; 323	MacCreary	1940
	---; March; 323	Jones & Bradley	1924
laticallus Philip	---; ---; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITAT; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *laticeps* Hine	---; ---; 62	Philip	1965
	---; May-Aug. and Oct.; 323	Middlekauff	1950
laticornis Hine	---; ---; 323	Stone	1938
lineola Fabricius	---; June-July; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Mud banks of ponds or slow streams, under stones or leaves, floating algae; bites by day; 323°	Schwardt	1936
	In pile of marsh grass debris, small bare humus area, root mass plant, all in salt marsh zone; marsh and inland; 323	MacCreary	1940
	Muddy edges of ponds and streams, salt marshes and occasionally in relatively dry areas; often appears in large numbers; 323	Pechuman	1957
	Margin of temporary pond, debris along lake shore; ---; 323	Philip	1931
	---; open and wooded pasture, wooded hillside, peak June-Sept.; 323	Schwardt & Hall	1930
	---; strongly attracted to light; 323	Frost & Pechuman	1958
	---; Feb.-Oct.; 323	Stone	1938
	---; peak in summer months; 323	Jones & Bradley	1923
lineola *hinellus* Philip	---; ---; 323	Philip	1965
lineola *lineola* Fabricius	---; ---; 323	Hays	1956
lineola *scutellaris* Walker	---; ---; 62. ---; May-Aug.; 323° (Common in barns, buildings and cars)	Frost & Pechuman	1958
	Edges of ponds, in wet sod and in cultivated ground; common inland, peak June-July; 323	Pechuman	1957
	---; salt marsh area, September; 323	MacCreary	1940
	---; April; 323	Fattig	1946

TABLE 1 HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
liorhinus Philip	---; July-Aug.; 62. ---; ---; 323	Stone	1938
longiglossus Philip	---; ---; 62, 323	Stone	1938
longiusculus Hine	---; May-July; 323	Fattig	1946
longus Osten Sacken	---; wooded hillsides; 323	Schwardt & Hall	1930
	---; July; 323	Frost & Pechuman	1958
	---; Aug.-Oct.; 323	Stone	1938
lugubris Macquart	---; ---; 323	Mosier & Snyder	1919
marginalis Fabricius	---; June-August; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
melanocerus Wiedemann	Matted roots of submerged switch grass; ---; 323	MacCreary	1940
	---; attracted to light; 323	Frost & Pechuman	1958
	---; March-April; 323	Stone	1938
	---; May-Nov ; 323	Fattig	1946
melanocerus lacustris Stone	---; ---; 323	Philip	1965
melanorhinus Bigot	---; ---; 62. ---; June-Aug.; 323	Stone	1938
metcalfi McDunnough	---: ---; 5. ---; April-Aug.; 62	Stone	1938
	---; rare, June; 323	Pechuman	1957
mexicanus Linnaeus	Mud at edge of stagnant water in brook bed and in holes formed by uprooted tree in wooded area; May, June, August; 323	Jones & Bradley	1924
microcephalus Osten Sacken	---; ---; 62	Stone	1938
	In hilly and mountainous areas; July-Sept.; 323	Pechuman	1957
	---; attracted to light; 323	Frost & Pechuman	1958
	---; June; 323	Philip	1931

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *minusculus* Hine	---; June; 62	McDunnough	1921
	Sphagnum bogs; amongst clumps of vegetation; July-Aug.; 323	Pechuman	1957
moderator Stone	---; May-July; 323	Fattig	1946
molestus Say	---; April-Aug.; 323	Fattig	1946
molestus *mixis* Philip	---; ---; 323	Philip	1965
monoensis Hine	---; July-Aug.; 323	Stone	1938
morbosus Stone	---; June-Aug.; 323	Stone	1938
mularis Stone	---; April-Nov.; 323	Stone	1938
nefarius Hine	---; June-Aug.; 323	Stone	1938
nigrescens Palisot de Beauvois	Wet soil at roots of vegetation; ---; 323	MacCreary	1940
	---; attracted to light; 323	Frost & Pechuman	1958
nigrescens *atripepennis* Stone	---; ---; 62	Philip	1950
	---; June-July; 323	Stone	1938
nigrescens *nigrescens* Palisot de Beauvois	---; ---; 323	Middlekauff & Quate	1950
nigripes Wiedemann	---; July-August; 62	Pechuman et al.	1961
	Salt marshes and along the margins of small streams; ---; 323	Pechuman	1957
	---; attracted to light, July and August; 323	Frost & Pechuman	1958
nigrovittatus Macquart	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man, in mid-summer, in woods)	Winn & Beaulieu	1915

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *nigrovittatus* Macquart (cont.)	---; ---; 62 (Salt marsh, brackish water). ---; April-Nov.; 323	Stone	19[illegible]
	Under marsh straw and mats of other vegetation; occurs in great numbers and especially attracted to bathers, coastal areas, peak July and Aug.; 323	Pechuman	1957
	Salt marshes, in roots and decomposed vegetation. under pile of salt grass; occasionally bites man; 323°	MacCreary	1940
	---; common on beaches and troublesome all summer, 323	Bequaert & Davis	1923
nigrovittatus *fulvilineis* Philip	---; ---; 323	Philip	1965
nivosus Osten Sacken	---; July; 62	Winn & Bequaert	1932
	---; ---; 62°. Muddy stream banks; ---; 323	Cameron	1926
	Hilly and mountainous areas; June-Aug.; 323°	Pechuman	1967
	Temporary and permanent pond, lake margins; ---; 323	Philip	1931
	Shore of tidewater stream above tide; ---; 323	MacCreary	1940
novaescotiae Macquart	---; July-Aug.; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
nudus McDunnough	---; ---; 5. ---, May-July; 62	Stone	1938
	---; common; 62	McDunnough	1921
	---; May-Aug.; 323	Philip	1931
ohioensis Hine	---; ---; 323	Bequaert & Davis	1923
oklahomaensis Stone	---; April; 323	Stone	1938
opacus Coquillett	---; ---; 62. ---, June-July; 323	Stone	1938
orbicallus Philip	---; June-July; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *orion* Osten Sacken	---; June-August; 62	Winn & Beaulieu	1932
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	---; on railroad train, July and Aug.; 323	Bequaert & Davis	1923
osburni Hine	---; June, July; 62	Hadwen	1914
	---; ---; 323	Knowlton & Thatcher	1934
pallidescens Philip	---; ---; 323	Philip	1965
peticlatus Hine	Wet soil under sphagnum moss at margin of marsh; ---; 323	MacCreary	1940
	---; May-July; 323	Stone	1938
	---; Aug., 323	Fattig	1946
phaenops Osten Sacken	---; ---; 5. Stem of grass, dried stems two to four inches above ground in marshy places; May-October, peak July and August; 323	Webb & Wells	1924
	---, rare; 62	McDunnough	1921
	Short grass and sedgy growths in typical wet meadows; ---, 323	Doten	1920
	---; edges of pools, bushes, tall grass; 323	Doten	1921
	---; grass of swampy areas; 351	Bailey	1949
philipi Stone	---; ---; 323	Stone	1938
procyon Osten Sacken	---; ---; 62. ---; April-Oct.; 323	Stone	1938
productus Hine	---; May-July; 323	Middlekauff	1950
proximus Walker	---; June and July; 323	Fattig	1946
pruinosus Rigot	---; May-July; 323	Stone	1938
psammophilus Osten Sacken	---; on white sand beaches; 323	Fairchild	1937

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *pumilus* Macquart	---; June-Aug.; 62	Pechuman et al.	1961
	Water-saturated soil near brooks; attracted to lights at night, peak July; 323	Pechuman	1957
	---; rarely bites man; 323°	MacCreary	1940
	---; open and wooded pasture; 323	Schwardt & Hall	1930
	---; March-Aug.; 323	Stone	1938
	---; peak April-May; 323	Jones & Bradley	1924
	---; common; 323	Bequaert & Davis	1923
punctifer Osten Sacken	Under stone of hillside; ---; 62	Spencer	1942
	Coarse grasses, trunks of small trees, in sand and gravel along edge of irrigation ditch; peak July-September; 323	Webb & Wells	1924
	Vegetation and mud at edge of pools; ---; 323	Doten	1921
	---, April-Oct.; 323	Stone	1938
quaesitus Stone	---; ---; 323	Philip	1965
quinquevittatus Wiedemann	---; June-August; 62	Pechuman et al.	1961
	Common in relatively dry situations, moist pastures, cultivated and hay fields, in mud along the margins of brooks; June-Aug., peak July, less aggressive in its attacks and rarely bites man; 323°	Pechuman	1957
	---; July-Sept.; 323	Blickle	1954
	---; ---; 323 (Taken in barns, buildings and light traps)	Frost & Pechuman	1958
quirinus Philip	---; scrub pine area; 323	Philip	1950a
recedens Walker	---; July; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	Near tidewater stream in dry, hard soil; in marsh grass; 323	MacCreary	1940
	---; May-Aug.; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS reinwardtii Wiedemann	---; June-Aug.; 62	Pechuman et al.	1961
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man, in mid-summer in woods)	Winn & Beaulieu	1915
	---; ---; 62. ---; attracted to light; 323 (In barns and shelters)	Frost & Pechuman	1958
	In mud along streams and ponds, usually in cool water and shaded areas; ---; 323	Pechuman	1957
	Borders of springs and spring-fed ponds or brooks with cold water; ---; 323	Schwardt	1936
	Temporary and permanent pond margins, lakes, running water; ---; 323	Philip	1931
	Heavy mud at backwater's edge, rapid stream, cattail bog; ---; 323	Stone	1930
	Sand by slow brook; ---; 323	Jones & Bradley	1923
	---; June-Sept.; 323	Stone	1938
	---; May; 323	Fattig	1946
rhombicus Osten Sacken	---; ---; 62, 323	Stone	1938
rhombicus rupestris McDunnough	---; July-Aug.; 323	Stone	1938
rufofrater Walker	---; April-June; 323	Stone	1938
rupestris McDunnough	---; ---; 62. From 5000-7500 feet, July; 323	McDunnough	1921
	---; experimental transmission of *Bacterium tularense*; 323	Parker	1934
sackeni Fairchild	---; at lights; 323	Pechuman	1957
	---; June-Sept.; 323	Fattig	1946
sagax Osten Sacken	---; July; 62	Pechuman et al.	1961
	---; strongly attracted to light; 323	Frost & Pechuman	1958
	---; June-Aug.; 323	Stone	1938
	---; rare, Sept.; 323	Pechuman	1957

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
schwardti nippontucki Philip	---; ---; 323	Philip	1965
schwardti schwardti Philip	---; ---; 323	Philip	1965
septentrionalis Loew	---; ---; 5	Stone	1938
	---; July; 62	Hadwen	1914
	---; ---; 62°	Cameron	1926
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man in mid-summer in woods)	Winn & Beaulieu	1915
	---; experimental transmission of *Bacterium tularense*; 323	Parker	1934
	---; June-Aug.; 323	Philip	1931
	---; ---; 323 (Leaves of aquatic plants, predaceous, bites in the woods and swamps or on the lake)	Metcalf	1932
sequax Williston	---; abundant at high elevation; 62	Hearle	1929
	---; June-Aug.; 62	Hadwen	1914
	---; ---; 323	Philip	1947
sexfasciatus Hine	---; June-July; 5. ---; ---; 62	Stone	1938
similis Macquart	---; June-August; 62	Pechuman et al.	1961
	---; ---; 323	Philip	1965
sonomensis Osten Sacken	---; ---; 5. ---; April-Oct.; 323	Stone	1938
	---; July, Aug.; 62	Hadwen	1914
sonomensis phaenops Osten Sacken	---; June-Sept.; 323	Stone	1938
sparus Whitney	---; June; 62	Winn & Beaulieu	1932
	---; strongly attracted to light; 323°	Frost & Pechuman	1956

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS	---; April; 323	Fattig	1946
sparus Whitney (cont.)	---; May-Sept.; 323	Stone	1938
sparus milleri Whitney	Salt marsh; ---; 323	MacCreary	1940
	---; June-Aug.; 323°	Frost & Pechuman	1958
	---; April; 323	Fattig	1946
sparus sparus Whitney	---; ---; 323	Hays	1956
stonei Philip	---; ---; 62, 323	Philip	1965
stonei jellisoni Philip	---; ---; 323	Philip	1965
stygius Say	---; June-July; 62	Pechuman et al.	1961
	Mud along ponds and streams, on aquatic plants--*Sagittaria*, in shallow water; most common in July; 323	Pechuman	195[illegible]
	Temporary and permanent pond margin, lakes, rotted log, grass roots; ---; 323	Philip	1931
	On vegetation in drainage ditches or ricefield supply canals; ---; 323	Schwardt	1936
	---; April-Aug.; 323	Stone	1938
	---; Oct.; 323	Fattig	1946
subfronto Philip	---; July and Aug.; 323	Philip	1936 a
sublongus Stone	---; June-Sept.; 323	Stone	1938
subniger Coquillett	---; June; 62	Pechuman et al.	1961
	---; June-July; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *sulcifrons* Macquart	---; July-August; 62	Pechuman et al.	1961
	In soil under crabgrass, bluegrass and ragweed with little moisture; in houses; 323	MacCreary	1940
	Dry and slightly moist soil, edges of ponds in saturated mud and plants debris; along country roads, active until dark, attracted to lights at night; 323	Pechuman	1957
	Open and wooded pasture, wooded hillside; peak July-Sept.; 323	Schwardt & Hall	1930
	Border of swamp, tree branch; ---; 323	Schwardt	1936
	---; May-Nov.; 323	Stone	1938
superjumentarius Whitney	---; edge of salt marsh and inland; 323	MacCreary	1940
	---; usually rare but occasionally abundant to be annoying, June-Aug., peak July; 323°	Pechuman	1957
tener Osten Sacken	---; ---; 323	Brimley	1922
tetricus *rubrilatus* Philip	---; June-Aug.; 323	Philip	1937
texanus Hine	---; June-Sept.; 323	Stone	1938
thoracicus Hine	---; July; 62	Winn & Beaulieu	1932
trepidus McDunnough	---; ---; 62. ---; June-Aug.; 323	Stone	1938
	Sphagnum moss; common; 323	Pechuman	1957
	Bogs; ---; 323	Philip	1931
	---; ---; 323°	Frost & Pechuman	1958
	---; ---; 323 (Leaves of aquatic plants, predaceous, bites in the woods and swamps or upon the lakes)	Metcalf	1932
trijunctus Walker	---; March-June; 323	Stone	1938

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS *trimaculatus* Palisot de Beavois	---; ---; 62	Philip	1947
	Low-growing vegetation at water's edge, borders of ponds or small streams, fresh or stagnant; ---; 323	Schwardt	1936
	On roots of torn up vegetation; inland; 323	MacCreary	1940
	Temporary or permanent pond, running water; ---; 323	Philip	1931
	Muddy margins of water; ---; 323	Pechuman	1957
	---; wooded pasture; 323	Schwardt & Hall	1930
	---; May-Aug.; 323	Jones & Bradley	1924
trispilus Wiedemann	---; June-August; 62	Winn & Beaulieu	1932
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man, in mid-summer, in woods)	Winn & Beaulieu	1915
	Very wet soil near the edge of a stream and in relatively dry sod; common on the base of a tree in a well-kept lawn, June-Aug., peak July; 323	Pechuman	1957
	Bogs; ---; 323	Philip	1931
	---; ---; 323 (Leaves of aquatic plants, predaceous, bites in the woods and swamps or on the lakes)	Metcalf	1932
truquii Bellardi	---; ---; 323	Stone	1938
turbidus Wiedemann	---; observed only at dusk and on cloudy day; 323	Jones & Bradley	1923
	---; May-Aug.; 323	Stone	1938
typhus Whitney	---; common in the hilly and mountainous areas, June-Aug., peak July; 323°	Pechuman	1957
	---; attracted to light; 323	Frost & Pechuman	1958
utahensis Rowe & Knowlton	---; Aug.; 323	Rowe & Knowlton	1935

TABLE 1 - HORSE FLIES (continued)

SPECIES	BREEDING HABITATS, ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS	Bank of stream and spring-fed pond; ---; 323	Schwardt	1936
venustus Osten Sacken	Mud at edge of small brook; ---; 323	Jones & Bradley	1924
	---; May-Aug.; 323	Stone	1938
venustus guatemalanus Hine	---; ---; 323	Philip	1965
vicarius Walker	-; ---; 62	Stone	1938
	Sandy loam in salt marsh zone; occasionally in coastal area, common in uplands, June-September; 323	MacCreary	1940
	---; April-June; 323	Fattig	1946
vittiger nippontucki Philip	---; April, May and Aug.; 323	Middlekauff	1950
vittiger schwardti Philip	---; June-July; 323	Pechuman	1957
vivax Osten Sacken	---; June; 62	Winn & Beaulieu	1932
	---; July-August; 62	Pechuman et al.	1961
	Pasture sod along the edge of a permanently wet area; occasionally taken at lights at night, July-Aug.; 323	Pechuman	1957
	Swift streams, spend most of larval period under water, under stones in gravel stream bed; ---; 323	Schwardt	1936
wiedemanni Osten Sacken	Mud under water in swampy meadow; ---; 323	Jones & Bradley	1923
	---; March-Aug.; 323	Stone	1938
wilsoni Pechuman	---; ---; 323	Philip	1965
zonalis Kirby	---; May-Aug.; 62	Winn & Beaulieu	1932
	---; ---; 62 (Carnivorous, muddy places, in swamps and along small streams, annoys man, in mid-summer in woods)	Winn & Beaulieu	1915
	---; June-July; 323	Philip	1931
	---; ---; 351	Kröber	1934

TABLE 1 - HORSE FLIES (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TABANUS			
zygotus Philip	---; at 7000 feet, July; 323	Philip	1937 a
zythiocior Philip	---; July-Sept.; 323	Stone	1938
WHITNEYOMYIA			
beatifica (Whitney)	---; April-June; 323	Stone	1938
beatifica atricorpus Philip	---; ---; 323	Philip	1965

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY HORSE FLIES

SPECIES	DISEASE ORGANISM					DISTRIBUTION
	VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER		
CHRYSOPS discalis Williston				Tularemia		[illegible]

LITERATURE CITED

Bailey, N. S.
1949. The hovering and mating of Tabanidae: a review of the literature with some original observations. Ann. ent. Soc. Amer. 41(4):403-412.

Bequaert, J. & W. T. Davis
1923. Tabanidae of Staten Island and Long Island, N. Y. Bull. Brooklyn ent. Soc. 18(4):113-122.

Blickle, R. L.
1954. Tabanidae of New Hampshire. Psyche, Camb., Mass. 61(2):74-80.

Brennan, J. M.
1935. The Pangoniinae of Nearctic America (Tabanidae,Diptera). Kans. Univ. Sci. Bull. 22(13):249-401.

Brimley, C. S.
1922. Additional data on North Carolina Tabanidae, Bombyliidae and Tachinidae (Diptera). Ent. News. 33(8):230-232.

Cameron, A. E.
1926. Bionomics of the Tabanidae (Diptera) of the Canadian prairie. Bull. ent. Res. 17(1):1-42.

Doten, S. B.
1920. Biting-flies of cattle. Rep. Nev. agric. Exp. Stn 1918-1919. 38 p.

_____.
1921. Horse-flies and cattle. Bull. Nev. agric. Exp. Stn. no. 102. 13 p.

Fairchild, G. B.
1937. A preliminary list of the Tabanidae (Diptera) of Florida. Florida Ent. 19(4):58-63.

Fattig, P. W.
1945. The Tabanidae or horseflies and deerflies of Georgia. Emory Univ. Mus. Bull. no. 4. 26 p.

Francis, E.
1937. Sources of infection and seasonal incidence of tularemia in man. Publ. Hlth Rep., Wash. 52(4):103-113.

Frost, S. W. & L. L. Pechuman
1958. The Tabanidae of Pennsylvania. Trans. Amer. ent. Soc. 84:169-215.

Hadwen, S.
1914. Notes on the life-histories of blood-sucking Diptera of British Columbia, with special reference to the Tabanidae. Proc. ent. Soc. B. C. (N. S.). no. 4. 46-49 p.

Hays, K. L.
1956. A synopsis of the Tabanidae (Diptera) of Michigan. Misc. Publ. Mus. Zool. Univ. Mich. no. 98. 79 p.

Hearle, E.
1929. Insects of the season 1928 in British Columbia. Insects affecting live stock and man. Rep. ent. Soc. Ont. 59:31-36.

Hine, J. S.
1906. Habits and life history of some flies of the family Tabanidae. Tech. Ser. U. S. Bur. Ent. 12(11):19-38.

_____.
1923. Horseflies collected by Dr. J. M. Aldrich in Alaska in 1921. Canad. Ent. 55(6):143-146.

Jones, T. H. & W. G. Bradley
1923. Observations on Tabanidae (Horseflies) in Louisiana. J. econ. Ent. 16(3):307-312.

_____. & _____.
1924. Further observations on Tabanidae (Horseflies) in Louisiana. J. econ. Ent. 17(1):45-50.

Knowlton, G. F. & T. O. Thatcher
1934. Utah horseflies. Proc. Utah Acad. Sci. 11:291-294.

Knutson, H., E. I. Coher, F. R. Lisciotto & J. C. Kuschke
1954. Notes on Chrysops, or deer flies (Tabanidae,Diptera) of New England. Mosquito News. 14(4):205-212.

Kröber, O.
1929. Ueber einige kleinere Gattungen der südamerikanischen Tabanini. Zool. Anz. 83(1-4):47-63, 115-137.

_____.
1934. Catalogo dos Tabanidae da America do Sul e Central, incluindo o Mexico e as Antilhas. Rev. Ent. Rio de J. 4(2-3):222-276, 291-333.

MacCreary, D.
1940. Report on the Tabanidae of Delaware. Bull. Del. agric. Exp. Sta. no. 226. 41 p.

McAtee, W. L. & W. R. Walton
1918. District of Columbia Diptera:Tabanidae. Proc. ent. Soc. Wash. 20(9):198-206.

McDunnough, J.
1921. A revision of the Canadian species of the *affinis* group of the genus *Tabanus* (Diptera). Canad. Ent. 53(6):139-144.

_____.
1922. Two new Canadian Tabanidae (Diptera). Canad. Ent. 54(10):238-240.

Metcalf, C. L.
1932. Black flies and other biting flies of the Adirondacks. Bull. N. Y. St. Mus. 289:5-58.

Middlekauff, W. W.
1950. The horse flies and deer flies of California (Diptera-Tabanidae). Bull. Calif. Insect Surv. 1(1):20 p.

_____. & L. W. Quate
1950. New distribution records for some Nearctic Tabanidae Pan-Pacif. Ent. 26(2):95-96.

Miller, L. A.
1951. Observations on the bionomics of some northern species of Tabanidae (Diptera). Can. J. Zool. 29(3):240-263.

Mosier, C. A. & T. E. Snyder
1919. Notes on the seasonal activity of Tabanidae in the lower Everglades of Florida. Proc. ent. Soc. Wash. 21(8):186-196.

Osburn, R. C.
1913. Tabanidae as inhabitants of the hydrophytic area. J. N. Y. ent. Soc. 21(1):63-65.

Parker, R. R.
1934. Recent studies of tick-borne diseases made at the United States Public Health Service at Hamilton, Montana. Proc. Pan-Pacif. sci. Congr 1933. pp. 3367-3374.

Pechumar, L. I.
1957. The Tabanidae of New York. Proc. Rochester Acad. Sci. 10(3):1-179.

_____, H. J. Teskey & D. M. Davies
1961. The Tabanidae (Diptera) of Ontario. Proc. ent. Soc. Ont. 91:77-121.

Philip, C. B.
1931. The Tabanidae (horseflies) of Minnesota with special reference to their biologies and taxonomy. Tech. Bull. Minn. agric. Exp. Sta. no. 80. 132 p.

_____.
1935. The furcatus group of western North American flies of the genus *Chrysops* (Diptera:Tabanidae) Proc. ent. Soc. Wash. 37(8):153-161.

_____.
1936. *Tabanus rhombicus* and related western horseflies. Canad. Ent. 68(7):148-160.

_____.
1936a. A new horsefly from the southeastern United States. J. Kans. ent. Soc. 9(3):100-101.

_____.
1937. New horseflies (Tabanidae,Diptera) from the southwestern United States. Pan-Pacif. Ent. 13(1-2):64-67.

_____.
1937a. Notes on certain males of North American horseflies (Tabanidae) II. The *affinis* or "red-sided" group of *Tabanus* sens. lat. with a key to the females. Canad. Ent. 69(2-3):49-58.

_____.
1947. A catalog of the blood-sucking fly family Tabanidae (horseflies and deerflies) of the Nearctic Region north of Mexico. Amer. Midl. Nat. 37(2):257-324.

_____.
1949. New North American Tabanidae (Diptera). Part I. Pangoniinae. Ann. ent. Soc. Amer. 42(4):451-460.

_____.
1950. Corrections and addenda to a catalog of Nearctic Tabanidae. Amer. Midl. Nat. 43(2):430-437.

_____.
1950a. New North American Tabanidae (Diptera). Part II. Tabanidae. Ann. ent. Soc. Amer. 43(1):115-122.

_____.
1952. The genus *Chrysozona* Meigen in North America (Diptera,Tabanidae). Proc. ent. Soc. Wash. 55(5):247-251

Philip, C. B.
1965. Family Tabanidae. pp. 329-348 *In*: A catalog of the diptera of America north of Mexico. Agricultural Research Service, United States Dept. of Agriculture. 1696 p.

Rowe, J. A. & G. F. Knowlton
1935. The genus *Tabanus* in Utah. Canad. Ent. 67(11):238-244.

_____. & _____.
1936. Pangoniinae of Utah (Tabanidae:Diptera). Ohio J. Sci. 36(5):253-258.

Schwardt, H. H.
1936. Horseflies of Arkansas. Bull. Ark. agric. Exp. Stn. no. 332. 66 p.

_____. & D. G. Hall
1938. Preliminary studies on Arkansas horse-flies. Bull. Ark. agric. Exp. Stn. no. 256. 27 p.

Segal, B.
1936. Synopsis of the Tabanidae of New York, their biology and taxonomy. I. The genus *Chrysops* Meigen. J. N. Y. ent. Soc. 44(1-2):51-78, 125-154.

Spencer, G. J.
1942. Two unusual larval habitats of Tabanids (Diptera). Proc. ent. Soc. B. C. no. 38. 10-12 p.

Stone, A.
1939. The bionomics of some Tabanidae (Diptera). Ann. ent. Soc. Amer. 23(2):261-304.

_____.
1938. The horseflies of the subfamily Tabaninae of the Nearctic Region. Misc. Publ. U. S. Dep. Agric. no. 305. 171 p.

Tashiro, H. & E. H. Schwardt
1949. Biology of the major species of horse flies of central New York. J. Econ. Ent. 42(2):269-272.

Twinn, C. R., B. Hocking, W. C. McDuffie & E. F. Cross
1948. A preliminary account of the biting flies at Churchill, Manitoba. Canad. J. Res. (D). 26(6):334-357.

Webb, J. L. & R. W. Wells
1924. Horse-flies: Biologies and relation to Western agriculture. Dep. Bull. U. S. Dep. Agric. 36 p.

Weber, N. A.
1950. A survey of the insects and related arthropods of Arctic Alaska. Part I. Trans. Amer. ent. Soc. 76(3):147-206.

Wehr, E. E.
1922. A synopsis of the Tabanidae of Nebraska, with a description of a new species from Colorado. Contr. Dep. Ent. Univ. Neb. no. 29. 12 p.

Winn, A. F. & C. Beaulieu
1915. A preliminary list of the insects of the Province of Quebec. Part II-Diptera. Rep. Quebec Soc. Prot. Pl. 7:108-150.

_____. & _____.
1932. A preliminary list of the insects of the province of Quebec. Part II-Diptera. Rep. Quebec Soc. Prot. Pl. 24:100 p.

F. BITING FLIES

Only 4 species of biting flies were recorded. A report of intestinal myiasis caused by *Stomoxys calcitrans* is included.

TABLE 1 - BITING FLIES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
STOMOXYS calcitrans (Linnaeus)	---; ---; 5, 62. ---; active June-Sept., peak Aug.; 323 (Pestiferous to man, vector of acute epidemic poliomyelitis)	Brues	1913
	---; abundant in Gulf beaches, active and persistent biters in the evening, July; 62°	Brues	1947
	---; ---; 323*	Canavan	1936
	---; ---; 323°	Simmons & Dove	1942
SYMPHOROMYIA atripes Bigot	---; ---; 5°	Frohne	1956
	---; inflicts a most painful bite, drawing blood profusely and causing some swelling of the bitten spot, persistent, bites on sunny days and in the open; 62°, 323°	Ross	1940
hirta Bigot	---; occasionally bite man savagely, bite cause irritation, swelling and itching, bites persistently; 323°	Mills	1943
pachycerus Williston	---; ---; 62, 323 (Aggressive biter)	Knab	1915

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY BITING FLIES

SPECIES	DISEASE ORGANISM				DISTRIBUTION
	VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	
STOMOXYS calcitrans (Linnaeus)				Intestinal myiasis	323

LITERATURE CITED

Brues, C. T.
1913. The geographical distribution of the stable-fly, *Stomoxys calcitrans*. J. econ. Ent. 6(6):459-477.

———.
1947. Dragonflies as predatory enemies of the stable-fly (*Stomoxys calcitrans*). Psyche. 53(3-4):50-51.

Canavan, W. P. N.
1936. Occurrence of intestinal and nasal myiasis in Oklahoma. J. Parasit. 22(2):228-229.

Frohne, W. C.
1956. The biology of northern mosquitoes. Publ. Hlth Rep., Wash. 71(6):616-621.

Knab, F.
1915. Dipterological Miscellany: Evolution of the blood-sucking habit in *Symphoromyia*. Proc. ent. Soc. Wash. 17(1):38-40.

Mills, H. B.
1943. An outbreak of the snipe fly *Symphoromyia hirta*. J. econ. Ent. 36(5):806 p.

Ross, H. H.
1940. The Rocky Mountain "black fly", *Symphoromyia atripes* (Diptera:Rhagionidae). Ann. ent. Soc. Amer. 32(2):254-257.

Simmons, S. W. & W. E. Dove
1942. Waste celery as a breeding medium for the stable fly or "dog fly", with suggestion for control. J. econ. Ent. 35(5):709-715.

G. NON-BITING FLIES

The entries for non-biting flies include representatives of several groups. Of course, the most important species in this category are those that feed as larvae on the tissues of living animals.

The table includes 45 species or subspecies.

TABLE 1 - NON-BITING FLIES

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
APHIOCHAETA *ferruginea* Brunnetti	---; ---; 323 (Causes intestinal myiasis)	Spooner	1920
CALLIPHORA *vicina* Robineau-Desvoidy	---; ---; 323*	Scott	1962
vomitoria (Linnaeus)	---; ---: 5, 62, 323 (Causes gastrointestinal myiasis)	James	1947
CALLITROGA *americana* (Cushing & Patton)	---, attacks fresh clean wounds; 323* (Causes traumatic myiasis of nose, mouth and sinuses, eyes, ears, genito-urinary and furuncular)	James	1947
CEPHALOMYIA *ovis* (Linnaeus)	---; ---; 351*	Herms	1925
COCHLIOMYIA *americana* Cushing & Patton	---; bites late in the spring or early in the summer; 323*°	Laake et al.	1936
	---; ---; 323*	Dove	1937
hominivorax Coquillett	---; ---; 323*	Canavan	1936
macellaria Fabricius	---; ---; 323*	Laake et al.	1936
CUTEREBRA *buccata* (Fabricius)	---; ---; 323*	Bequaert	1946
DROSOPHILA *funebris* (Fabricius)	---; ---; 323*	Dove	1937
ERISTALIS *tenax* (Linnaeus)	---; ---; 323* (Foul water, decaying vegetable matter and fruits)	Swartzwelder & Cali	1942
	---; ---; 351*	Dove	1937
FANNIA *canicularis* Linnaeus	---; ---; 62*	Detwiler	1929
	---; ---; 323*	Dove	1937
scalaris Fabricius	---; ---; 323*	Dove	1937
GASTEROPHILUS *haemorrhoidalis* (Linnaeus)	---; ---; 62, 323 (Causes creeping myiasis, mostly on face and buttocks)	James	1947
	---; ---; 323*	Dove	1937

TABLE 1 - NON-BITING FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
GASTROPHILUS intestinalis (De Geer)	---; ---; 62*	Dove	1937
	---; ---; 62, 323 (Causes creeping subcutaneous myiasis and of the eyes)	James	1947
HERMETIA illuscens (Linnaeus)	Hives of small bees, decaying fruits or vegetables, decaying animal matter including carcasses of men and dogs, privies, artificial containers; taken from feces of boy; 323	Meleney & Harwood	1935
	---; ---; 323*	Canavan	1936
HIPPELATES collusor (Townsend)	---; attracted to faces of children, nuisance, suspected vector of conjunctivitis, Feb.-Nov.; 323°	Womeldorf & Mortenson	1963
dorsalis Loew	---; attracted to man, especially to arms and hands, annoying, May-Nov., peak Oct.; 323°	Womeldorf & Mortenson	1963
pusio Loew	In human excrement; attracted to moist places, worst on warm humid days, from May-frost in autumn, vector of conjunctivitis and trachoma, mostly among young children; 323**	Bengtson	1953
	---; attracted to men, April-Dec.; 323	Womeldorf & Mortenson	1963
robertsi Sabrosky	---; attracted to men, ubiquitous, Feb.-Oct., peak May; 323	Womeldorf & Mortenson	1963
HYPODERMA bovis (Linnaeus)	---; ---; 62, 323 (Causes creeping, furuncular and myiasis of eyes)	James	1947
lineatum (De Villers)	---; ---; 62. ---; parasitized by seven larvae, almost complete paralysis of the lower extremities resulted; 323* (Causes creeping, furuncular and myiasis of the eyes)	James	1947
LUCILIA illustris (Meigen)	---; myiasis in open wound in leg; 62*. ---; myiasis of ulcer on the side of head; 323*	James	1947
sericata (Meigen)	---; ---; 323 (Cause myiasis)	Knipling & Rainwater	1937
MESOSELIA scutaris (Loew)	---; ---; 323 (Causes traumatic myiasis of eyes and enteric myiasis)	James	1947
MUSCA domestica Linnaeus	Decaying animal or vegetable matter; common, carrier of typhoid fever; 62	Winn & Beaulieu	1919
	---; ---; 323*	Frison	1925

TABLE 1 - NON-BITING FLIES (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MUSCA	---; ---; 323*	Dove	1937
domestica Linnaeus (cont.)	---; ---; 323 (Proved to be a carrier of typhoid fever, tuberculosis, dysentry, summer diarrhea of infants, tropical ulcers, Asiatic cholera)	Flint	1922
MUSCINA *stabulans* (Fallén)	---; ---; 5, 62, 323 (Enter houses and may oviposit on foods, can cause enteric myiasis)	James	1947
	---; ---; 323*	Dove	1937
OESTRUS *ovis* Linnaeus	---; ---; 323*	Dove	1937
PHAENICIA *cuprina* (Wiedemann)	---; ---; 323*	Scott	1962
sericata (Meigen)	---; ---; 323*	Ryckman & Halstead	1952
PHORMIA *regina* (Meigen)	---; ---; 5, 62, 323 (Traumatic, dermal myiasis)	James	1947
	---; ---; 323*	Dove	1937
PIOPHILA *casei* (Linnaeus)	---; ---; 323*	Scott	1962
	---; ---; 351*	Dove	1937
SARCOPHAGA *barbata* Thomson	---; ---; 62, 323 (Traumatic myiasis, can cause extensive and deep lesions)	James	1947
bullata Parker	---; ---; 62, 323* (Causes traumatic enteric myiasis)	James	1947
	---; ---; 323*	Dove	1937
	---; ---; 323*	Watson	1942
cooleyi Parker	---; ---; 62*	Twinn	1935
crassipalpis Macquart	---; ---; 323 (Occurs in traumatic dermal myiasis)	James	1947
haemorrhoidalis (Fallén)	---; ---; 62, 323 (Causes traumatic enteric and genito-urinary myiasis)	James	1947
	---; ---; 323*	Dove	1937

TABLE 1 - NON-BITING FLIES (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SARCOPHAGA			
lambens Wiedemann	---; ---; 323 (Causes traumatic myiasis of ears)	James	1947
pallinervis Thomson	---; ---; 323*	Dove	1937
plinthopyga Wiedemann	---; ---; 62, 323 (Causes myiasis in old and festered sores or invade diseased body openings)	James	1947
TITANOGRYPHA *alata* (Aldrich)	---; ---; 323 (Causes traumatic myiasis of the nose, mouth and sinuses)	James	1947
WOHLFAHRTIA			
meigeni (Schiner)	---; ---; 323*	Mills et al.	1945
opaca (Coquillett)	---; ---; 62*, 323*	James	1947
vigil (Walker)	---; ---; 5*, 62*, 323* (Causes furuncular subcutaneous or cutaneous myiasis)	James	1947
	---; May-Sept.; 62*	Ford	1936
	---; ---; 323*	Gertson et al.	1933
	---; ---; 323°	James	1944

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY NON-BITING FLIES

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
CALLIPHORA *vicina* Robineau-Desvoidy				Intestinal myiasis	323
CALLITROGA *americana* (Cushing & Patton)				Cutaneous myiasis	323
CEPHALOMYIA *ovis* (Linnaeus)				Ophthalo-myiasis	351
COCHLIOMYIA *americana* Cushing & Patton				Myiasis	323
				Myiasis of tissue, eyes, nasal and sinus cavities	323 (Dove, 1937)
hominivorax Coquillett				Nasal myiasis	323
macellaria Fabricius				Myiasis	323
CUTEREBRA *buccata* (Fabricius)				Cutaneous myiasis	323
DROSOPHILA *funebris* (Fabricius)				Intestinal myiasis	323
ERISTALIS *tenax* (Linnaeus)				Intestinal myiasis	323, 351
FANNIA *canicularis* Linnaeus				Urinary myiasis	62, 323
scalaris Fabricius				Urinary myiasis	323
GASTEROPHILUS *haemorrhoidalis* (Linnaeus)				Creeping myiasis	323
intestinalis (DeGeer)				Creeping myiasis	62

TABLE 2 - NON-BITING FLIES (continued)

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
HERMETIA					
illucens (Linnaeus)				Intestinal myiasis	323
HIPPELATES					
pusio Loew				Conjunctivitis & Trachoma	323
HYPODERMA					
lineatum (De Villers)				Myiasis	323
LUCILIA					
illustris (Meigen)				Subcutaneous myiasis	62, 323
MUSCA					
domestica Linnaeus				Intestinal myiasis	323
				Myiasis of necrotic skin tissue	323 (Dove, 1937)
MUSCINA					
stabulans (Fallén)				Intestinal myiasis	323
OESTRUS					
ovis Linnaeus				Eye myiasis	323
PHAENICA					
cuprina (Wiedemann)				Intestinal myiasis	323
sericata (Meigen)				Nasal myiasis	323
PHORMIA					
regina (Meigen)				Myiasis	323
PROPHILA					
casei (Linnaeus)				Intestinal myiasis	323, 351
SARCOPHAGA					
bullata Parker				Intestinal myiasis	323
				Myiasis of necrotic tissues on foot and leg	323 (Dove, 1937)
				Necrotic and dermal myiasis	323 (James, 1947)

TABLE 2 - NON-BITING FLIES (conclusion)

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
SARCOPHAGA					
cooleyi Parker				Myiasis of ear	62
haemorrhoidalis (Fallén)				Intestinal myiasis	323
pallinervis Thomson				Intestinal myiasis	323
WOHLFAHRTIA					
meigeni (Schiner)				Cutaneous myiasis	323
opaca (Coquillett)				Furuncular sub-cutaneous myiasis	62, 323
vigil (Walker)				Cutaneous myiasis	62, 323
				Furuncular sub-cutaneous myiasis	62, 323 (James, 1947)

LITERATURE CITED

Bengston, I. A.
1933. Seasonal acute conjunctivitis occurring in the Southern States. Publ. Hlth Rep., Wash. 48(31):917-926.

Sequaert, J.
1946. Cutaneous myiasis due to *Cuterebra* in Massachusetts. Psyche. 52(3-4):175-176.

Canavan, W. P. N.
1936. Occurrence of intestinal and nasal myiasis in Oklahoma. J. Parasit. 22(2):228-229.

Detwiler, J. D.
1929. Notes on myiasis of the urinary passage caused by larvae of *Parria*. 59th Rep. ent. Soc. Ont. pp. 57-59.

Dove, W. E.
1937. Myiasis of man. J. econ. Ent. 30(1):29-39.

Flint, W. P.
1922. The control of household insects. Circ. Ill. Agric. Exp. Sta. no. 257. 24 p.

Ford, N.
1936. Further observations on the behaviour of *Wohlfahrtia vigil* (Walk.) with notes on the collecting and rearing of the flies. J. Parasit. 22(4):309-328.

Frison, T. H.
1925. Intestinal myiasis and the common house-fly (*Musca domestica*, Linn.). J. econ. Ent. 18(2):334-336.

Gertson, G. D., W. E. G. Lancaster, G. A. Larson & G. C. Wheeler
1933. *Wohlfahrtia* myiasis in North Dakota. Report of two cases. J. Amer. med. Ass. 100(7):487-488.

Herms, W. F.
1925. Ophthalmomyiasis in man due to *Cephalomyia (Oestrus) ovis* (Linn.). J. Parasit. 12(1):54-56.

James, M. T.
1944. Two erroneous records in American literature of the causative agents of myiasis. J. Parasit. 30(4):273-274.

———
1947. The flies that cause myiasis in man. Misc. Publ. U. S. Dep. Agric. no. 631. 175 p.

Knipling, E. F. & H. T. Rainwater
1937. Species and incidence of dipterous larvae concerned in wound myiasis. J. Parasit. 23(5):451-455.

Lacke, E. W., E. C. Cushing & H. E. Parish
1936. Biology of the primary screw worm fly, *Cochliomyia americana*, and a comparison of its stages with those of *C. macellaria*. Tech. Bull. U. S. Dep. Agric. no. 507. 24 p.

Melenay, H. E. & P. D. Harwood
1935. Human intestinal myiasis due to the larvae of the soldier fly, *Hermetia illucens* Linné (Diptera,Stratiomyidae). Amer. J. trop. Med. 15(1):45-49.

Mills, H. B., J. A. Callenbach & J. F. Reinhardt
1943 Maggots attacking a human (*Wolfahrtia meigeni* Schin.). Bull. Mont. agric. Exp. Sta. no. 425. 23-24 p.

Ryckman, R. E. & B. W. Dalstead
1952. Report of a case of human nasal myiasis by the green-bottle fly, *Phaenicia sericata*, in San Bernardino County, California. Amer. J. trop. Med. Hyg. 1(4):711-712.

Scott, H. G.
1962. Blister beetle dermatitis produced by *Epicauta cinerea* (Coleoptera:Meloidae). J. econ. Ent. 55(1):145-146.

Spooner, C. S.
1920. An interesting case of milk contamination. J. econ. Ent. 13(4):368-369.

Swartzwelder, J. C. & S. J. Cali
1942. Human intestinal myiasis due to syrphid larvae. Report of an additional case (*Eristalis tenax*). Amer. J. trop. Med. 22(2):159-163.

Twinn, C. R.
1935. A summary of insect conditions in Canada in 1934. Rep. ent. Soc. Ont. 65:112-128.

Watson, J. R.
1942. *Sarcophaga cullata* Parker as a cause of intestinal myiasis. Florida Ent. 25(1):5-6.

Winn, A. F. & G. Beaulieu
1915. A preliminary list of the insects of the Province of Quebec. Part II-Diptera. Rep. Quebec Soc. Prot. Pl. 7:108-159.

Woeldorf, D. J. & E. W. Mortenson
1963. *Hippelates* gnats in central California. Calif. Vector Views. 10(9):57-60, 61-62.

H. FLEAS

The entries for fleas include almost no biology. Very few authors deal with flea biology. A few comment on fleas as vectors, but most of the literature deals with taxonomy and hosts. Only when the flea species is said to bite man is a host recorded here.

The tables include 543 species or subspecies.

TABLE 1 - FLEAS

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ACTENOPHTHALMUS heiseri (McCoy)	---; ---; 323	da Costa Lima & Hathaway	1946
ACTENOPSYLLA suavis Jordan & Rothschild	---, ---; 323	Hubbard	1947
AETHEOPSYLLA septentrionalis Stewart & Holland	---; ---; 62	da Costa Lima & Hathaway	1946
AMPHALIUS necopinus (Jordan)	---; ---; 5, 62, 323	Holland	1949
AMPHIPSYLLA ewingi Fox	---; ---; 5	da Costa Lima & Hathaway	1946
neotomae Fox	---; ---; 323	da Costa Lima & Hathaway	1946
sibirica pollionis (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
sibirica sibirica (Wagner)	---; ---; 26	da Costa Lima & Hathaway	1946
ANIOMIOPSYLLUS amphibolus Wagner	---; ---; 323	da Costa Lima & Hathaway	1946
congruens Stewart	---; all year; 323	Linsdale & Davis	1956
falsicaliformicus Fox	---; ---; 323	da Costa Lima & Hathaway	1946
hiemalis Eads & Menzies	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ANOMIOPSYLLUS *montanus* Collins	---; ---; 323	da Costa Lima & Hathaway	1946
novomexicanensis Williams & Hoff	---; Feb., Oct. and Dec.; 323	Williams & Hoff	1951
nudatus (Baker)	---; experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
princei Barnes	---; at 7000 feet elevation, April; 323	Barnes	1965
walkeri Barnes	---; Jan.-April; 323	Barnes	1965
ARCTOPSYLLA *setosa* (Rothschild)	---; ---; 62, 323	Holland	1949
ursi (Rothschild)	---; ---; 5, 62, 323	Hubbard	1947
ARCTOPSYLLUS *montanus* Collins	---; ---; 323	Jellison et al.	1943
ATHEROPSYLLA *bakeri* Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
ATYPHLOCERAS *artius* Jordan	---; ---; 62, 323	Hubbard	1947
bishopi Jordan	---; Nov.; 323	Fuller	1943
echis Jordan & Rothschild	---; Dec.; 323	Williams & Hoff	1951
felix Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
longipalpus Stewart	---; Nov.-April; 323	Linsdale & Davis	1956

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ATYPHLOCERAS multidentatus (Fox)	---; ---; 62	Holland	1949
	---; experimental vector of, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; Oct.-July; 323	Linsdale & Davis	1956
AUGUSTSONIUS ashcrafti Augustson	---; ---; 323	Hubbard	1947
CALLISTOPSYLLUS campestris Holland	---, ---; 62, 323	Holland	1949
congruens Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
leuterus Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
paratarinus Wagner	---; ---; 62	da Costa Lima & Hathaway	1946
terinus (Rothschild)	---; ---; 62, 323	Hubbard	1947
CARTERETTA carteri Fox	---; ---; 323	Hubbard	1947
carteri carteri Fox	---; Sept.-April; 323	Linsdale & Davis	1956
carteri clavata Good	---; ---; 323	da Costa Lima & Hathaway	1946
CATALLAGIA borealis Ewing	---; ---; 62	Brown	1944
	---; Aug. and Dec.; 323	Geary	1959
	---; Sept.; 323	Ewing	1929
chamberlini Hubbard	---; ---; 62	Holland	1949
	---, ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CATALLAGIA			
charlottensis (Baker)	---; ---; 62, 250, 323	Ewing & Fox	1943
decipiens Rothschild	---; ---; 62	Hubbard	1947
	---; experimentally infected with plague; 323	Pratt & Wiseman	1962
mathesoni Jameson	---; ---: 351	Jellison et al.	1953
moneris Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
motei Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
neveyi Holland & Loshbaugh	---; ---; 323	Stark	1958
onaga Jordan	---; ---, 323	Fox	1940
rutherfordi Auguston	---; ---; 323	da Costa Lima & Hathaway	1946
scalleni Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
telegoni Rothschild	---; ---; 62	Mail & Holland	1942
vonbloekeri Auguston	---; ---; 323	da Costa Lima & Hathaway	1946
wymani (Fox)	---; experimentally infected with plague; 323	Pratt & Wiseman	1962
CEDIOPSYLLA *inaequalis* (Baker)	---; ---; 62	Mail & Holland	1942
	---; ---; 323	Stark	1958
inaequalis *inaequalis* (Baker)	---; ---; 62, 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CEDIOSYLLA			
inaequalis interrupta Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
simplex (Baker)	---; ---; 62	Holland	1949
	---; ---; 323°	Hubbard	1947
	---; Oct.-July; 323	Mathewson & Hyland	1964
	---; ---; 323 (Probable vector of *Pasteurella typhi*)	Geary	1959
CERATOPHYLLUS			
acutus Baker	---; ---; 323	Bishopp	1915
adustus Jordan	---; ---; 62	da Costa Lima & Hathaway	1946
aeger Rothschild	---; ---; 62	Mail & Holland	1942
affinis neglectus Smit	---; June; 323	Smit	1958
borealis Rothschild	---; ---; 126	da Costa Lima & Hathaway	1946
	---; ---; 351	Jellison et al.	1953
caedens durus Jordan	---; ---; 62	Jordan	1932 a
californicus Baker	---; ---; 323	Hubbard	1943
canis Curtis	---; ---; 323	Robinson	1913
celsus Jordan	---; ---; 62	Mail & Holland	1942
	---; ---; 323	Fox	1940
celsus celsus Jordan	---; ---; 62	da Costa Lima & Hathaway	1946
	---; June, July; 323	Geary	1959

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CERATOPHYLLUS diffinis Jordan	---; ---; 62, 323	da Costa Lima & Hathaway	1946
eumolpi eumolpi Rothschild	---; ---; 62	Jordan	c. 1932
fasciatus (Bosc d'Antic)	---; carrier of *Trypanosoma lewisi* and *Hymenolepis diminuta*, concerned in the transmission of Bubonic plague; 62°	Spencer	1937
	---; ---; 323°	Robinson	1913
gallinae (Schrank)	---; ---; 62	Holland	1949
	---; March, May, Aug., Oct.-Dec.; 323°	Geary	1959
gallinae gallinae (Schrank)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
gallinulae Dale	---; ---; 62	Jordan & Rothschild	1920
garei Rothschild	---; ---; 5, 62, 323	Ewing & Fox	1943
gibsoni Fox	---; ---; 62	Jordan & Rothschild	1920
idius Jordan & Rothschild	---; ---; 62	da Costa Lima & Hathaway	1946
	---; Aug., Sept.; 323	Geary	1959
labis Jordan & Rothschild	---; ---; 62	Jordan & Rothschild	1922
lucifer Rothschild	---; ---; 62	Mail & Holland	1942
niger Fox	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
	---; ---; 351°	Pratt & Wiseman	1962
niger inflexus Jordan	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CERATOPHYLLUS	---; ---; 5, 62, 323*	Hubbard	1947
niger			
niger Fox	---; ---; 323	Jellison et al.	1943
oculatus Baker	---; ---; 323	Jordan & Rothschild	1921
pelecani Auguston	---; ---; 323	da Costa Lima & Hathaway	1946
penicilliger Grube	---; ---; 62	Jordan	1932a
pearochelidoni Wagner	---; ---; 62, 323	da Costa Lima & Hathaway	1946
queterensis Fox	---; ---; 62	da Costa Lima & Hathaway	1946
querini Rothschild	---; ---; 62	Jordan	1932a
riparius Jordan & Rothschild	---; ---; 62	Holland	1949
	---; May-Aug.; 323	Geary	1959
swansoni Liu	---; ---; 323	Hubbard	1947
tundrensis Holland	---; ---; 62	Hubbard	1947
vagabundus (Boheman)	---; ---; 5	Hubbard	1947
vagabundus			
vagabundus (Boheman)	---; ---; 351	Jellison et al.	1953
wansoni Liu	---; ---; 323	da Costa Lima & Hathaway	1946
CHAETOPSYLLA	---; ---; 323	da Costa Lima & Hathaway	1946
floridensis (Fox)			
globiceps (Taschenberg)	---; ---; 126	Ewing & Fox	1943
	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS, ADULT ACTIVITY: DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CHAETOPSYLLA homoeus homoeus Rothschild	---, ---; 62	da Costa Lima & Hathaway	1946
lotoris (Stewart)	---; Jan., Feb., Sept., Nov. and Dec., 323	Geary	1959
setosa Rothschild	---; ---; 62	Mail & Holland	1942
stewarti Johnson	---; ---; 323	Stark	1958
CONORHINOPSYLLA nidicola Jellison	---; Feb.-March, Nov.-Dec.; 323	Jellison	1945
stanfordi Stewart	---; ---; 62	Holland	'49
	---; April, Oct., Dec.; 323	Geary	1959
CORRODOPSYLLA curvata (Rothschild)	---; ---; 5	Weber	1950
	---; ---; 62	Mail & Holland	1942
	---: July; 323	Mathewson & Hyland	1964
curvata curvata (Rothschild)	---; June and Aug.; 62	Buckner	1964
	---; April, May and Aug.; 323	Geary	1959
curvata obtusata (Wagner)	---, ---, 62, 323	da Costa Lima & Hathaway	1946
hamiltoni (Traub)	---; March; 323	Geary	1959
jellisoni (Hubbard)	---; ---; 323	Ewing & Fox	1943
CORYPSYLLA jordani Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
ornata Fox	---; ---; 62	Hubbard	1947
	---; May, July and Aug.; 323	Lindsdale & Davis	1956

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CORYPSYLLA setosifrons Stewart	---; ---; 321	da Costa Lima & Hathaway	1946
CORYPSYLLOIDES kohlei Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
CTENOCEPHALIDES canis (Curtis)	---; ---; 62*	Holland	1949
	---; ---; 62	Spencer	1936
	---; in homes, under houses, prefer locations with dust and organic debris accumulation, serious pest particularly during the summer, experimental vector of plague; 323*	Pratt & Wiseman	1962
	---; all year; 323	Trembley & Bishopp	1940
	---; ---; 323 (Intermediate host of *Hymenolepis diminuta*, *Leishmania donovani* and *L. infantum*, annoys man during summer)	Hubbard	1947
	---; ---; 323 (Implicated in the transmission of *Dipylidium caninum*, plague, *Hymenolepis diminuta*, *Dirofilaria immitis* and *Leishmania donovani*)	Geary	1959
felis (Bouché)	---; ---; 62 (Serious pest from June-August, experimentally infected with plague)	Hubbard	1947
	---; in homes, under houses, prefer locations with dust and organic debris accumulation, serious pest, particularly during summer, experimental vector of plague, experimentally and naturally infected with plague; 323*	Pratt & Wiseman	1962
	---; all year; 323	Trembley & Bishopp	1940
	---; ---; 323 (Intermediate host for *Dipylidium caninum* and *Dirofilaria immitis*, important vector of plague during epidemics)	Ewing & Fox	1943
felis felis (Bouché)	---; household, Jan., Sept., Nov.; 62	Buckner	1964
	---; ---; 62*	Holland	1949
	---; causes flea allergy, naturally infected with plague; 323	Stark	1958

TABLE I - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CTENOCEPHALIDES felis felis (Bouché) (cont.)	---; from houses, yard, Jan.-March, May, July, Sept.-Dec.; 323[a] (Implicated in transmission of *Dipylidium caninum*, *Rickettsia typhi*, *Dirofilaria immitis*, probably of importance during bubonic plague)	Geary	1959
CTENOPHTHALMUS pseudagyrtes (Baker)	---; Aug., Oct.; 62	Buckner	1964
	---; common, April; 323	Fuller	1943
	---; June-March; 323	Mathewson & Hyland	1964
pseudagyrtes pseudagyrtes Baker	---; Jan., March-Dec.; 323	Geary	1959
CTENOPHYLLUS terribilis (Rothschild)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
CTENOPSYLLA selenis Rothschild	---; ---; 62	Wagner	1936
CTENOPSYLLUS hamifer Rothschild	---; ---; 62	Mail & Holland	1942
musculi Duges	---; ---; 323	Robinson	1913
pavalliensis Dunn & Parker	---; ---; 62	Mail & Holland	1942
segnis (Schonherr)	---; ---; 323	Fox	1940
selenis Rothschild	---; ---; 62	Mail & Holland	1942
DACTYLOPSYLLA bluei (Fox)	---; ---; 323	da Costa Lima & Hathaway	1946
bluei bluei Fox	---; Jan.-May, July, Aug., Nov., 323	Linsdale & Davis	1956
bottaceps Hubbard	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DACTYLOPSYLLA	---; ---; 62	Holland	194[illegible]
comis Jordan	---; ---; 323	Hubbard	1947
ignota (Baker)	---; ---; 323	Stark	1958
ignota acuta Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
ignota albertensis (Jordan & Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
ignota apachina (Fox)	---; ---; 323	Stark	1958
ignota arizonensis (Hubbard)	---; ---; 323	Stark	1958
ignota franciscana (Rothschild)	---; ---; 323	da Costa Lima & Hathaway	1946
ignota ignota (Baker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
ignota regula (Jordan & Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
ignota utahensis (Wagner)	---; ---; 323	da Costa Lima & Hathaway	1946
minidoka Prince & Stark	---; ---; 323	Stark	1958
montieola Prince	---; ---; 323	Hubbard	1947
moorei Hubbard	---; ---; 351	Jellison et al.	1953
neomexicana Prince	---; ---; 323	Hubbard	1947
nudilenacrile Prince	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DACTYLOPSYLLA			
pacifica Hubbard	---; ---; 323	Hubbard	1947
percermis Eads & Menzies	---; ---; 351	Jellison et al.	1953
rara Fox	---; ---; 323	da Costa Lima & Hathaway	1946
stimsoni (Fox)	---; ---; 323	da Costa Lima & Hathaway	1946
gallinulae perpinnatus (Baker)	---; ---; 62, 250	Ewing & Fox	1943
	---; ---; 323°	Hubbard	1947
	---; ---; 323	da Costa Lima & Hathaway	1946
stejnegeri (Jordan)	---; ---; 351	Jellison et al.	1953
DELOTELIS *mohavensis* Auguston	---; ---; 323	da Costa Lima & Hathaway	1946
telegoni (Rothschild)	---; ---; 62, 323	Hubbard	1947
DIAMANUS *montanus* (Baker)	---; ---; 62	Hubbard	1943
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; experimentally infected with both plague and *Salmonella*; 323	Eskey et al.	1951
	---; all year; 323	Linsdale & Davis	1956
	---; ---; 323° (Moderately efficient vector of plague)	Hubbard	1947
	---; ---; 323 (Probable vector of *Pasteurella tularensis*)	Geary	1959

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DOLICHOPSYLLUS *stylosus* (Baker)	---; ---; 62, 323	Hubbard	1947
DORATOPSYLLA *blarinae* (Fox)	---; ---; 62	Holland	1949
	---; Feb. and April; 323	Mathewson & Hyland	1964
	---; July-Dec.; 323	Geary	1959
curvata Rothschild	---; ---; 62, 323	Hubbard	1940
curvata *curvata* Rothschild	---; ---; 62, 323	Hubbard	1947
curvata *obtusata* (Wagner)	---; ---; 62	Jellison & Good	1942
jellisoni Hubbard	---; ---; 323	Hubbard	1947
ECHIDNOPHAGA *gallinacea* (Westwood)	---; naturally infected with endemic typhus; 323	Eddy	1943
	---; experimental vector of plague, naturally and experimentally infected with plague; 323	Pratt & Wiseman	1962
	---; vector capacity for plague; 323	Macchiavello	1954
	---; all year; 323	Trembley & Bishopp	1940
	---; ---; 323[4*]	Hubbard	1947
	---; ---; 323 (Naturally infected with *Rickettsia typhi*)	Geary	1959
gallinacea *gallinacea* (Westwood)	---; ---; 323	da Costa Lima & Hathaway	1946
EPITEDIA *faceta* (Rothschild)	---; Jan., March, Sept. and Dec.; 323	Geary	1959
inopina (Rothschild)	---; ---; 62, 323	Ewing & Fox	1943
jordani Traub	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SPITEDIA			
neotomae Jameson	---; Oct.; 323	Jameson	1946
scapani (Wagner)	---; ---; 62. 323	da Costa Lima & Hathaway	1946
stanfordi Traub	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; Dec.; 323	Williams & Hoff	1951
stewarti Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
testor (Rothschild)	---; experimental vector of plague, naturally and experimentally infected with plague; 323	Pratt & Wiseman	1962
vermanni (Rothschild)	---; Feb., Aug. and Sept.; 62	Buckner	1964
	---; Mar.; 323	Fuller	1943
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; Feb., April, Nov. and Dec.; 323	Mathewson & Hyland	1964
vermanni testor (Rothschild)	---; Sept., Oct. and Dec.; 323	Geary	1959
vermanni vermanni (Rothschild)	---; March, April, Aug.-Dec.; 323	Geary	1959
EPTESCOPSYLLA			
chapini (Jordan)	---; Jan.; 323	Geary	1959
vancouverensis (Wagner)	---; ---; 62, 323	Hubbard	1947
FONTELLA			
ignota (Baker)	---; naturally infected with plague; 323	Pratt & Wiseman	1962
ignota acuta Stewart	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
FOXELLA	---; ---; 62	Holland	1949
ignota albertensis (Jordan & Rothschild)	---; ---; 323	Hubbard	1947
ignota apachira (Fox)	---; ---; 323	Hubbard	1947
ignota arizonensis Hubbard	---; ---; 351	Jellison et al	1953
ignota clantoni Hubbard	---; ---; 351	Jellison et al.	1953
ignota coufferi Augustan	---; ---; 323	Hubbard	1947
ignota franciscana (Rothschild)	---; July, Aug., Oct.-May; 323	Lindsdale & Davis	1956
ignota ignota (Baker)	---; ---; 323	Hubbard	1947
ignota omissa Prince	---; ---; 323	Hubbard	1947
ignota recula (Jordan & Rothschild)	---; ---; 62, 323	Hubbard	1947
ignota utahensis Wagner	---; ---; 351	Jellison et al.	1953
utahensis arizonensis Hubbard	---; ---; 323	Hubbard	1947
utahensis utahensis Wagner	---; ---; 323	Hubbard	1947
GEBSIBIA	---; ---; 323	da Costa Lima & Hathaway	1946
ashcrafti (Augustan)			

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HECTOPSYLLA *psittaci* Frauenfeld	---; ---; 323	Hubbard	1947
HOPLOPSYLLUS *affinis* (Baker)	---; ---; 62	Holland	1949
	---; all year; 323	Eddy	1943
	---; ---; 323°	da Costa Lima & Hathaway	1946
anomalus (Baker)	---; experimental vector of plague, naturally and experimentally infected with plague; 323*	Pratt & Wiseman	1962
	---; vector capacity for plague; 323	Stark	1958
	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
	---; all year, peak July-Aug ; 323°	Linsdale & Davis	1956
	---; ---; 323 (Vector of bubonic plague)	Hubbard	1947
foxi Ewing	---; April, June-Aug., Oct. and Dec.; 323	Linsdale & Davis	1956
glacialis Taschenberg	---; ---; 26	Jordan	1932
	---; ---; 62	Spencer	1936
glacialis *affinis* (Baker)	---; experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
glacialis *foxi* Ewing	---; ---; 323	da Costa Lima & Hathaway	1946
glacialis *glacialis* (Taschenberg)	---; ---; 62, 126, 323	da Costa Lima & Hathaway	1946
glacialis *lynx* Baker	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
lynx (Baker)	---; ---; 323	Fox	1940
tenuidigitus Stewart	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYSTRICHOPSYLLA	---; Aug.; 62	Buckner	1964
dippiei Rothschild	---; experimental vector of plague; 323	Wayson	1947
	---; vector capacity for plague; 323	Machiavello	1954
dippiei truncata Holland	---; experimental vector of and naturally infected with plague; 323	Pratt & Wiseman	1962
gigas (Kirby)	---, ---; 62	Holland	1949
	---, ---; 323	Eads	1949
gigas dippiei Rothschild	---; ---; 62, 323	da Costa Lima & Hathaway	1946
gigas gigas (Kirby)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
gigas tahavuana Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
linsdalei Holland	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
mammoth Chapin	---; ---; 323	da Costa Lima & Hathaway	1946
occidentalis Holland	---; ---; 62	Holland	1949
schefferi Chapin	---; ---; 62	Holland	1949
	---; ---; 323	da Costa Lima & Hathaway	1946
schefferi mammoth Chapin	---; ---; 323	Hubbard	1947
schefferi schefferi Chapin	---; ---; 323	Hubbard	1947
spinata Holland	---; ---; 62	Holland	1949

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HYSTRICHOPSYLLA	---; ---; 62	Holland	1949
tahavuana Jordan	---: Aug. and Oct.; 323	Geary	1959
JELLISONIA			
bullisi (Augustson)	---; ---; 351	Jellison et al.	1953
ironsi (Eads)	---; ---; 351	Jellison et al.	1953
JORDANOPSYLLA			
alfredi Traub & Tipton	---, ---; 323	Stark	1958
JUXTAPULEX			
porcinus (Jordan & Rothschild)	---; ---; 323	Hubbard	1947
LEPTOPSYLLA			
catatina Jordan	---; ---; 323	Hubbard	1940
musculi Jordan & Rothschild	---; experimentally infected with endemic typhus; 323	Dyer et al.	1932
ravalliensis Dunn & Parker	---; ---: 62	Spencer	1936
segnis (Schonherr)	---; ---; 62, 323 (Vector of plague)	Hubbard	1947
	---; experimental vector of plague; 323	Mayson	1947
	---; experimentally infected with plague; 323	Pratt & Wiseman	1962
	---; Jan.-April, June-Aug.; 323°	Linsdale & Davis	1956
	---; indoors, all year; 323	Cole & Koepke	1946
	---; rare, abundant in cool wet season; 323	Yeh & Davis	1950
	---: ---; 323 (Can transmit plague and *hymenolepis diminuta*)	Geary	1959
telenis Rothschild	---; ---: 62	Spencer	1936
	---; ---; 323	Hubbard	1940

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MALARAEUS			
bitterootensis (Dunn)	---; ---; 62, 323	Hubbard	1947
hobbsi Hubbard	---; ---; 323	Hubbard	1947
eremicus (Baker)	---; ---; 323	Hubbard	1947
euphorbi (Rothschild)	---; ---; 62	Holland	1949
	---; ---; 323	Stark	1958
neotomae (Fox)	---; ---; 351	Jellison et al.	1953
penicilliger Grube	---; ---; 62	Wagner	1936
penicilliger dissimilis Jordan	---; ---; 5, 62	Hubbard	1947
sinomus (Jordan)	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
telchinum (Rothschild)	---; ---; 62	Holland	1949
	---; experimental vector of plague; 323	Wayson	1947
	---; experimentally infected with plague; 323	Stark	1958
	---; all year; 323	Linsdale & Davis	1956
telchinus Rothschild	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; ---; 323 (Probable vector of *Pasteurella tularensis*)	Geary	1959
vomfintelis Prince	---; ---; 323	Stark	1958
MEGABOTHRIS	---; ---; 62	Hubbard	1947
abantis (Rothschild)	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
acerbus (Jordan)	---; ---; 62	Holland	1949
	---; April, May, July and Sept.; 323	Geary	1959

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MEGABOTHRIS			
adversus Wagner	---; ---; 62	Hubbard	1947
asio (Baker)	---; ---; 62	Mail & Holland	1942
	---; June and Nov.; 323	Mathewson & Hyland	1964
asio *asio* (Baker)	---; ---; 62	Holland	1949
	---; March, June-Oct.; 323	Geary	1959
[illegible] *megacolpus* (Jordan)	---; June-Aug.; 62	Buckner	1964
[illegible] *[illegible]ecrus* Jordan	---; ---; 323	Hubbard	1947
atrox (Jordan)	---; ---; 62	Holland	1949
calcarifer *gregsoni* Holland	---; ---; 351	Jellison et al.	1953
clantoni	---; ---; 323	Pratt & Wiseman	1962
clantoni *clantoni* Hubbard	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; ---; 351	Jellison et al.	1953
clantoni *johnsoni* Hubbard	---; ---; 351	Jellison et al.	1953
groenlandicus (Wahlgren)	---; ---; 62	Holland	1949
impetis (Jordan)	---; ---; 62	Jellison & Good	1942
lucifer (Rothschild)	---; ---; 62	Holland	1949

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MEGABOTHRIS			
megacolpus Jordan	---; ---; 62	Hubbard	1947
obscurus Holland	---; ---; 62	Holland	1949
ponerus (Rothschild)	---; ---; 323	Jellison & Good	1942
princei Hubbard	---; ---; 351	Jellison et al.	1953
quirini (Rothschild)	---; ---; 5	Hubbard	1947
	---; July-Sept.; 62	Buckner	1964
	---; July-Sept.; 323	Geary	1959
vison (Baker)	---; April, June, Sept. and Nov.; 323	Geary	1959
wagner (Baker)	---; ---; 323	Fox	1940
MEGARTHROGLOSSUS			
beckii Tipton & Allred	---; experimentally infected with plague; 323	Stark	1958
bisetis Jordan & Rothschild	---; March; 323	Williams & Hoff	1951
divisus (Baker)	---; ---; 62	Spencer	1936
	---; ---; 323	Jellison et al.	1943
divisus bisetis Jordan & Rothschild	---; ---; 323	Hubbard	1947
divisus divisus (Baker)	---; ---; 62	da Costa Lima & Hathaway	1946
	---; experimentally infected with plague; 323	Pratt & Wiseman	1962
divisus exsecatus Wagner	---; ---, 62	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MEGARTHROGLOSSUS			
divisus *wallowensis* Hubbard	---; ---; 323	Hubbard	1947
longispinus Baker	---; ---; 62	Mail & Holland	1942
procus Jordan & Rothschild	---; ---; 62	da Costa Lima & Hathaway	1946
	---; ---; 323	Stark	1958
procus *oregonensis* Hubbard	---; ---; 323	Hubbard	1947
procus *procus* Jordan & Rothschild	---; ---; 62	Hubbard	1947
pygmaeus Wagner	---; ---; 62	Holland	1949
	---; ---; 323	da Costa Lima & Hathaway	1946
senisles Wagner	---; ---; 62	Spencer	1936
sicamus Jordan & Rothschild	---; ---; 62	da Costa Lima & Hathaway	1946
similis Wagner	---; ---; 62	Holland	1949
smiti Mendez	---; ---; 323	Stark	1958
spenceri Wagner	---; ---; 62	Holland	1949
stanfordi Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
MERINGIS *arachis* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MERINGIS			
bilsingi Eads & Menzies	---; ---; 351	Jellison et al.	1953
cunningi (Fox)	---; all year; 323	Linsdale & Davis	1956
dipodomys Kohls	---; Feb.; 323	Williams & Hoff	1951
	---; Nov., Dec.; 323	Kohls	1938
hubbardi Kohls	---; June, July and Sept.; 323	Kohls	1938
jamesoni Hubbard	---; ---; 323	Hubbard	1947
jewetti Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
nidi Williams & Hoff	---; March; 323	Williams & Hoff	1951
parkeri Jordan	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
	---; Feb., March and Dec.; 323	Williams & Hoff	1951
shannoni (Jordan)	---; ---; 62, 323	Hubbard	1947
walkeri Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
MICROPSYLLA *goodi* Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
sectilis (Jordan & Rothschild)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
sectilis goodi Hubbard	---; ---; 62	Holland	1949
sectilis sectilis (Jordan & Rothschild)	---; ---; 62	Holland	1949

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MIOCTENOPSYLLA arctica Rothschild	---; ---; 5	da Cos[illegible] L[illegible]	1946
MOPLOPSYLLA foreinus (Jordan & Rothschild)	---; ---; 323	Costa ima & Hathaway	1946
NOSOPSYLLUS anisus (Rothschild)	---; ---; 351	Liu	1936
ciliatus (Baker)	---; experimentally infected with plague; 323	Pratt & Wiseman	1962
ciliatus ciliatus (Baker)	---; ---; 323	Jellison & Good	1942
ciliatus kincaidi Hubbard	---; ---; 323 (Experimentally infected with plague)	Stark	1958
ciliatus mononis (Jordan)	---; ---; 323	Hubbard	1947
ciliatus protinus (Jordan)	---; ---; 5, 62, 323	Hubbard	1947
europi (Rothschild)	---; ---; 62 (Experimental transmission of plague, bites man)	Holland	1944
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; naturally infected with *Coxiella burnetii*: 323	Sidwell et al.	1964
europi americanus Hubbard	---; ---; 323	Stark	1958
europi canadensis Hubbard	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MONOPSYLLUS			
eumolpi charlestonensis Hubbard	---; ---; 351	Jellison et al.	1953
eumolpi cyrturus (Jordan)	---; ---; 323	Stark	1958
eumolpi eumolpi (Rothschild)	---; experimentally infected with sylvatic plague; 62	Mail & Holland	1942
	---; July; 62	Buckner	1964
eumolpi wallowensis Hubbard	---; ---; 351	Jellison et al.	1953
eutamiadus Auguston	---; ---; 323	Hubbard	1947
exilis Jordan	---; experimental vector of, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
exilis exilis (Jordan)	---; ---; 323	Hubbard	1947
exilis kansensis Hubbard	---; ---; 323	Hubbard	1947
exilis opadus Jordan	---; ---; 323	Hubbard	1947
exilis triptus Jordan	---; ---; 323	Hubbard	1947
formacis Jordan	---; all year; 323	Linsdale & Davis	1956
thambus (Jordan)	---; ---; 62	Holland	1949
vison (Baker)	---; ---; 5, 323	Hubbard	1947
	---; May-Sept.; 62	Buckner	1964
vison vison Baker	---; ---; 62	Spencer	1936

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
MONOPSYLLUS *wagneri* (Baker)	---; experimental vector of and experimentally infected with plague; 323	Pratt & Wiseman	1962
	---; all year; 323	Linsdale & Davis	1956
wagneri *kylei* Hubbard	---; ---; 351	Jellison et al.	1953
wagneri *ophidius* (Jordan)	---; ---; 62	Holland	1949
	---; ---; 323	Hubbard	1947
wagneri *systaltus* (Jordan)	---; July, Sept.; 62	Buckner	1964
wagneri *wagneri* (Baker)	---; ---; 62, 323 (Experimentally infected with plague)	Hubbard	1947
	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
MYODOPSYLLA *collinsi* Kohls	---; ---; 323	da Costa Lima & Hathaway	1946
crosbyi (Baker)	---; ---; 323	da Costa Lima & Hathaway	1946
gentilis (Jordan & Rothschild)	---; ---; 62, 323	Hubbard	1947
insignis (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
	---; April, May, July and Aug.; 323	Geary	1959
	---; June; 323	Mathewson & Byland	1964
MYODOPSYLLOIDES *palposa* Rothschild	---; ---; 62, 323	Hubbard	1947
palposus (Rothschild)	---; ---; 62	Holland	1949
piercei Augustson	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
NEARCTOPSYLLA			
brooksi (Rothschild)	---; ---; 62, 323	Holland	1949
genalis (Baker)	---; ---; 62, 323	Hubbard	1940
genalis genalis (Baker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
genalis hygini (Rothschild)	---; ---; 62	Holland	1949
genalis laurentina	---; ---; 62	Holland	1949
Jordan & Rothschild	---; April, Oct. and Dec.; 323	Geary	1959
hamata Holland & Jameson	---; ---; 351	Jellison et al.	1953
hygini Rothschild	---; ---; 62	Mail & Holland	1942
hygini hygini (Rothschild)	---; ---; 62	Jellison & Good	1942
hygini laurentina Jordan & Rothschild	---; ---; 62	Jellison & Good	1942
hyrtaci (Rothschild)	---; ---; 62	Holland	1949
	---; ---; 323	Stark	1958
jordani Hubbard	---; ---; 62, 323	da Costa Lima & Hathaway	1946
jordani jordani Hubbard	---; ---; 351	Jellison et al.	1953
jordani traubi Hubbard	---; ---; 351	Jellison et al.	1953
princei Holland & Jameson	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
NEOPSYLLA			
grandis Rothschild	---; ---; 62	Mail & Holland	1942
inopina Rothschild	---; ---; 62, 323 (Vector of plague)	Hubbard	1947
	---; experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
scapani Wagner	---; ---; 62	Jellison & Good	1942
texana Stewart	---; ---; 323	Hubbard	1947
wermanni Rothschild	---; ---; 62	Mail & Holland	1942
NOSOPSYLLUS *fasciatus* (Bosc d'Antic)	---; experimentally infected with sylvatic plague; 62	Mail & Holland	1942
	---; experimental vector of plague experimentally and naturally infected with plague; 323°	Pratt & Wiseman	1962
	---; experimentally infected with and experimental vector of *Salmonella enteritidis*: 323	Eskey et al.	1949
	---; experimentally infected with both *Pasteurella pestis* and *Salmonella*; 323	Eskey et al.	1951
	---; vector capacity for plague; 323	Stark	1958
	---; Jan., Aug.; 323 (Vector of plague, involved in transmission of *Rickettsia typhi*, can transmit *Hymenolepis diminuta*)	Geary	1959
	---; common, abundant in cool, wet seasons, spring, maximum about March; 323	Yeh & Davis	1950
	---; indoors, Feb.-July, Sept.-Dec.; 323	Cole & Koepke	1946
	---; ---; 323°	Hubbard	1947
londiniensis (Rothschild)	---; ---; 323	da Costa Lima & Hathaway	1946
NYCTERIDOPSYLLA			
chapini Jordan	---; ---; 323	Jellison & Good	1942

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS· ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
NYCTERIDOPSYLLA *vancouverensis* Wagner	---; ---; 62	Jellison & Good	1942
ODONTOPSYLLUS *dentatus* (Baker)	---; ---; 62	Holland	1949
	---; all year; 323	Linsdale & Davis	1956
multispinosus (Baker)	---; ---; 62	Brown	1944
	---; Feb.; 323	Layne	1958
	---; March-April, Nov.-Dec.; 323	Mathewson & Hyland	1964
spenceri Dunn	---; ---; 323	Ewing & Fox	1943
OPISOCROSTIS *bruneri* (Baker)	---; Aug.; 62	Buckner	1964
	---; ---; 62 (Efficient plague carrier)	Holland	1944
	---; experimental transmission of plague; 323*	Prince	1943
hirsutus (Baker)	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; possible vector of plague; 323	Stark	1958
labis (Jordan & Rothschild)	---; experimentally infected with sylvatic plague; 62	Hail & Holland	1942
	---; experimental vector of plague, naturally and experimentally infected with plague; 323	Pratt & Wiseman	1962
	---; ---; 323*	Prince	1943
oregonensis Good & Prince	---; ---; 323	Hubbard	1947
ornatus Fox	---; ---; 323	Jellison	1947
saundersi (Jordan)	---; ---; 62	Holland	1949

TABLE . - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CRISOCROSTIS *tuberculatus* Baker	---; ---, 62 (Experimentally infected with sylvatic plague)	Mail & Holland	1942
	---; experimental vector of plague; 323	Wayson	1947
	---; vector capacity for plague; 323	Macchiavello	1954
tuberculatus *cynomuris* Jellison	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; experimentally infected with plague; 323	Stark	1958
tuberculatus *ornatus* Fox	---; ---; 323	Hubbard	1947
tuberculatus *tuberculatus* (Baker)	---; ---; 62	Holland	1949
	---; vector capacity for plague; 323*	Prince	1943
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
washingtonensis Good & Prince	---; ---; 323	Hubbard	1947
CRISODASYS *enoplus* (Rothschild)	---; ---; 323	da Costa Lima & Hathaway	1946
jellisoni Fox	---; ---; 323	Hubbard	1947
keeni (Baker)	---; ---; 62, 250, 323	Ewing & Fox	1943
keeni *keeni* (Baker)	---; ---; 323	Stark	1958
keeni *nesiotus* Augustson	---; experimental vector of plague and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; ---; 351	Jellison et al.	1953
nesiotus Auguston	---; vector capacity for plague; 323	Macchiavello	1954
peratensis Dampf	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
OPISODASYS pseudarctomys (Baker)	---; Sept.; 62	Buckner	1964
	---; April; 323	Mathewson & Hyland	1964
	---; Aug. and Oct.; 323	Geary	1959
robustus Jordan	---; ---; 323	Hubbard	1947
robustus robustus (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
desperalis (Jordan)	---; ---; 62, 323	Hubbard	1947
ORTHOPEAS caedens (Jordan)	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
caedens caedens (Jordan)	---; ---; 5, 323	Hubbard	1947
	---; July-Sept.; 62	Buckner	1964
caedens durus (Jordan)	---; ---; 5	Jellison & Wohlis	1939
	---; ---; 62	Hubbard	1947
	---; Nov.; 323	Geary	1959
dieteri (Fox)	---, ---; 323	da Costa Lima & Hathaway	1946
howardii (Baker)	---; ---; 62	Eads and	1949
	---; in houses; 323°	Pratt & Wiseman	1962
	---; March-July-Sept.-Nov.; 323	Mathewson & Hyland	196
howardii howardii (Baker)	---; in house, Jan.. Feb., April-Dec.; 323	Geary	1959
howardii texensis Eads	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ORCHOPEAS labiatus Baker	---; ---; 323	da Costa Lima & Hathaway	1946
latens (Jordan)	---; Jan.; 323	Linsdale & Davis	1956
leucopus (Baker)	---; May-Oct.; 62. ---; most abundant in May; 323	Buckner	1964
	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; March-Dec.; 323	Geary	1959
	---; Feb.; 323	Mathewson & Hyland	1964
nectomae Augustson	---; naturally infected with plague; 323	Stark	1958
nepos (Rothschild)	---, ---; 62, 323	Hubbard	1947
nepos dieteri (Fox)	---; ---; 323	Jellison & Good	1942
nepos nepos (Rothschild)	---; ---; 62	Jellison & Good	1942
semedentatus (Baker)	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; vector capacity for plague; 323	Macchiavello	1954
serdentatus agilis (Rothschild)	---; ---; 62*	Brown	1944
	---; experimental transmission of plague; 323	Stark	1958
serdentatus cascadensis Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
serdentatus intermedius Hubbard	---; ---; 323	Hubbard	1947
serdentatus nectomae Auguston	---; ---; 323	Hubbard	1947
serdentatus nevadensis (Jordan)	---; naturally infected with plague; 323 (Vector of bubonic plague)	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ORCHOPEAS			
sexdentatus pennsylvanicus (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
sexdentatus schisintus (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
sexdentatus sexdentatus (Baker)	---; experimental vector of plague; 323	Pratt & Wiseman	1962
	---; all year; 323	Linsdale & Davis	1956
dickhami Baker	---; June, Oct.-Dec.; 323	Fuller	1943
ORNITHOPHAGA			
nearctica Holland & Loshbaugh	---; ---; 323	Stark	1958
OROPSYLLA			
alaskensis (Baker)	---, ---; 5	da Costa Lima & Hathaway	1946
	---; ---; 62	Holland	1949
arctomys (Baker)	---; ---; 5	da Costa Lima & Hathaway	1946
	---; May-July; 62	Buckner	1964
	---; Jan.-July, Sept.-Dec.; 323	Geary	1959
bruneri (Baker)	---; ---; 62	Brown	1944
	---; ---; 323	da Costa Lima & Hathaway	1946
hirsuta (Baker)	---; ---; 323	da Costa Lima & Hathaway	1946
idahoensis (Baker)	---; ---; 5 (Experimentally infected with plague)	Hubbard	1947
	---; ---; 62*	Brown	1944
	---; experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962

[illegible] - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
[illegible]	---; ---; 62*	Brown	1944
[illegible] & [illegible]ild)	---; ---; 323	da Costa Lima & Hathaway	1946
[illegible]	---; ---; 323	da Costa Lima & Hathaway	1946
[illegible] (Prince)	---; ---; 323	da Costa Lima & Hathaway	1946
[illegible] (Jordan)	---; ---; 62*	Brown	1944
	---; ---; 62, 323 (Experimentally infected with plague)	Hubbard	1947
	---; experimental vector of plague; 323	Wayson	1947
	---; ---; 323*	Prince	1943
[illegible] (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
tuberculata cynomuris (Jellison)	---; ---; 323	da Costa Lima & Hathaway	1946
tuberculata [illegible] (Fox)	---; ---; 323	da Costa Lima & Hathaway	1946
tuberculata tuberculata (Baker)	---; ---; 62*	Brown	1944
	---; ---; 62, 323	da Costa Lima & Hathaway	1946
washingtonensis (Good & Prince)	---; ---; 323	da Costa Lima & Hathaway	1946
PARATYPHLOCERAS oregonensis Ewing	---; ---; 323	da Costa Lima & Hathaway	1946
PEROMYSCOPSYLLA adelpha (Rothschild)	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PEROMYSCOPSYLLA *catalina* (Jordan)	---; July, Sept.; 62	Buckner	1964
	---; July, Aug. and Oct.; 323	Geary	1959
	---; Nov.; 323	Fuller	1943
diana Traub	---; ---; 323	Hubbard	1947
ebrighti (Fox)	---; ---; 323	da Costa Lima & Hathaway	1946
hamifer *hamifer* (Rothschild)	---; ---; 62, 323	Ewing & Fox	1943
hamifer *longiloba* (Jordan)	---; ---; 5	da Costa Lima & Hathaway	1946
hamifer *markworthi* Hubbard	---; ---; 351	Jellison et al.	1953
hamifer *vigens* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
hemisphaerium Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
hesperomys (Baker)	---; Mar., July, Aug.; 323	Fuller	1943
hesperomys *adelpha* (Rothschild)	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; all year; 323	Linsdale & Davis	1956
hesperomys *hemisphaerium* Stewart	---; ---; 351	Jellison et al.	1953
hesperomys *hesperomys* (Baker)	---; April, May, July-Nov.; 323	Geary	1959
hesperomys *pacifica* Holland	---; ---; 62	Holland	1949
hesperomys *ravalliensis* Johnson & Traub	---; ---; 323	Stark	1958

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PEROMYSCOPSYLLA *rovalliensis* (Dunn & Parker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
scotti Fox	---; Aug.-Oct.; 323	Geary	1959
	---; Dec.-Feb.; 323	Layne	1958
selenis (Rothschild)	---; ---; 62, 323	Hubbard	1947
PHALACROPSYLLA *alios* Wagner	---; March; 323	Williams & Hoff	1951
montiola Auguston	---; ---; 323	da Costa Lima & Hathaway	1946
paradisea Rothschild	---; ---; 323	da Costa Lima & Hathaway	1946
PLEOCHAETIS *sibynus* (Jordan)	---; naturally infected with plague, 323	Pratt & Wiseman	1962
POLYGENIS *gayni* (Fox)	---; experimental vector of plague; 323	Pratt & Wiseman	1962
	---; vector capacity for plague; 323	Macchiavello	1954
spinulosa Burmeister	---; ---; 323	Hill & Ingram	1947
PULEX *brasiliensis* Baker	---; ---; 323	Pettit	1923
irritans (Linnaeus)	---; in houses; 62°	Spencer	1936
	---; ---; 62, 323 (Causes flea allergy, experimentally infected with plague)	Hubbard	1947
	---; ---; 62*	Brown	1944
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; all year; 323	Linsdale & Davis	1956
	---; house; 323	Svihla	1941
	---; ---; 323*°	Stark	1958

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PULEX *irritans* *irritans* Linnaeus	---; ---; 323* (Involved as plague vector, c. transmit *Rickettsia typhi* and *Hymenolepsis diminuta*)	Geary	1959
porcinus Jordan & Rothschild	---, ---; 323	Jordan & Rothschild	1923
sciuri Hall	---; ---; 323	da Costa Lima & Hathaway	1946
RECTOFRONTIA *fraterna* (Baker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
sectilis Jordan & Rothschild	---; ---; 62	Mail & Holland	1942
RHADINOPSYLLA *fraterna* (Baker)	---; ---; 62	Spencer	1936
	---; ---; 323	Stark	1958
sectilis Jordan & Rothschild	---; ---; 62	Jordan & Rothschild	1923
sectilis *sectilis* (Jordan & Rothschild)	---; ---; 323	Stark	1958
RHINOLOPHOPSYLLA *palposa* (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
RHOPALOPSYLLUS *cori* Eads	---; ---; 323	Randolph & Eads	1947
guyni (Fox)	---; ---; 323	da Costa Lima & Hathaway	1946
platensis *cisandinus* Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
sigmodoni Stewart	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SAPHIOPSYLLA *bishopi* (Jordan)	---; ---; 62	Holland	1949
	---; April; 323	Mathewson & Hyland	1964
	---; Nov.; 323	Geary	1959
STENISTOMERA *alpina* (Baker)	---; naturally infected with plague; 323	Pratt & Wiseman	1962
macrodactyla Good	---; naturally infected with plague; 323	Pratt & Wiseman	1962
STENOPONIA *americana* (Baker)	---; ---; 62	da Costa Lima & Hathaway	1946
	---; Sept.-April; 323	Layne	1958
ponera Traub & Johnson	---; ---; 323	Stark	1958
STERNOPSYLLA *carlsbadensis* (Ewing)	---; ---; 323	da Costa Lima & Hathaway	1946
distincta *texana* (Fox)	---; ---; 323	Johnson	1957
texana (Fox)	---; Jan. and Mar.; 323	Fuller	1943
TAMIOPHILA *grandis* (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
	---; April-May, July, Sept.; 323	Geary	1959
texana (Stewart)	---; ---; 323	da Costa Lima & Hathaway	1946
TARSOPSYLLA *coloradensis* (Baker)	---; ---; 62. ---; at 10,000 feet elevation, Aug.; 323	Pratt & Lane	1950
THRASSIS *acamantis* (Rothschild)	---; ---; 5, 62, 323 (Experimentally infected with plague)	Hubbard	1947
	---; ---; 62*	Brown	1944

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THRASSIS			
acamantis *acamantis* Rothschild	---; vector capacity for plague; 323	Macchiavello	1954
acamantis *utahensis* (Wagner)	---; ---; 323	Stark	1958
aridis Baker	---; ---; 323	da Costa Lima & Hathaway	1946
aridis *campestris* Prince	---; ---; 323	Stark	1958
aridis *hoffmani* (Hubbard)	---; ---; 323	Stark	1958
arizonensis Baker	---; vector capacity for plague; 323	Macchiavello	1954
	---; experimental vector of plague; 323	Wayson	1947
arizonensis *arizonensis* (Baker)	---; ---; 323	da Costa Lima & Hathaway	1946
arizonensis *desertorum* Stewart	---; ---; 323	da Costa Lima & Hathaway	1946
arizonensis *littoris* (Jordan)	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
augustomi Hubbard	---; ---; 351	Jellison et al.	1953
bacchi (Rothschild)	---; ---; 62, 323 (Vector of plague)	Hubbard	1947
	---; experimental vector of plague; 323	Wayson	1947
	---; ---; 323*	Prince	1943
bacchi *bacchi*	---; experimental vector and naturally infected with plague; 323	Pratt & Wiseman	1962
bacchi *caducus* (Jordan)	---; ---; 323	Stark	1958

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THRASSIS			
bacchi consimilis Stark	---; ---: 323	Stark	1958
bacchi gladiolis (Jordan)	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
	---; naturally infected with plague; 323	Pratt & Wiseman	1962
bacchi johnsoni	---; experimental vec plague; 323	Pratt & Wiseman	1962
brennani Auguston	---; ---; 323	Hubbard	1947
campestris Prince	---; March; 323	Williams & Hoff	1951
desertorum Stewart	---; ---; 323	Ewing & Fox	1943
fotus (Jordan)	---; naturally infected with plague; 323	Pratt & Wiseman	1962
	---; experimental vector of plague; 323	Wayson	1947
francisi (Fox)	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
francisi francisi (Fox)	---; ---; 323	Stark	1958
gladiolis caducus (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
gladiolis gladiolis (Jordan)	---; ---; 62*	Brown	1944
	---; ---; 323 (Experimentally infected with plague)	Hubbard	1947
gladiolis johnsoni Hubbard	---; ---; 351	Jellison et al.	1953
hoffmani (Hubbard)	---; ---; 351	Jellison et al.	1953

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THRASSIS howelli (Jordan)	---; experimental vector of plague; 323	Wayson	1947
	---; vector capacity for plague; 323	Macchiavello	1954
howelli howelli (Jordan)	---; ---; 323 (Experimentally infected with plague)	Hubbard	1947
howelli utahensis Wagner	---; ---; 323	Hubbard	1947
jellisoni Hubbard	---; ---; 323	da Costa Lima & Hathaway	1946
pandorae Jellison	---; experimental vector of plague and experimentally infected with plague; 323	Pratt & Wiseman	1962
pansus (Jordan)	---; Feb. and Sept.; 323	Williams & Hoff	1951
petiolatus (Baker)	---; ---; 62*	Brown	1944
	---; ---; 62 (Experimentally infected with plague)	Hubbard	1947
	---; experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
princei Hubbard	---; ---; 351	Jellison et al.	1953
rockwoodi Hubbard	---; ---; 323	Hubbard	1947
setosis Prince	---; ---; 323	da Costa Lima & Hathaway	1946
spenceri Wagner	---; ---; 62	da Costa Lima & Hathaway	1946
stanfordi Wagner	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
THRASSOIDES aridis Prince	---; ---; 323	Hubbard	1947
campestris (Prince)	---; ---; 323	Hubbard	1947

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TRICHOPSYLLA *abantis* (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
acerba (Jordan)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
adversa (Wagner)	---; ---; 62	Ewing & Fox	1943
asio *asio* (Baker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
asio *orecta* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
atrox (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
bakeri (Wagner)	---; ---; 62	da Costa Lima & Hathaway	1946
bitterrootensis (Dunn & Parker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
ciliata *ciliata* (Baker)	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
ciliata *mononis* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
ciliata *pectina* (Jordan)	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
dobbsi (Nubbard)	---; ---; 323	da Costa Lima & Hathaway	1946
ermnica (Baker)	---; ---; 323	da Costa Lima & Hathaway	1946
eumolpi *cyrtura* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TRICHOPSYLLA	---; ---; 62*	Brown	1944
eumolpi			
eumolpi (Rothschild)	---; ---; 323	Ewing & Fox	1943
euphorbi (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
eutamiadis (Augustson)	---; ---: 323	da Costa Lima & Hathaway	1946
exilis *exilis* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
exilis *opada* (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
exilis *tripta* (Jordan)	---; ---; 323	Ewing & Fox	1943
floridensis Fox	---; ---; 323	Fox	1940
formacis (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
groenlandica (Wahlgreen)	---; ---; 126	Ewing & Fox	1943
immitis (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
ironsi Eads	---; ---; 323	Randolph & Eads	1947
lctoris Stewart	---; Dec.; 323	Fuller	1943
lucifer (Rothschild)	---; ---; 62	da Costa Lima & Hathaway	1946
megacolpa (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
penicilliger *dissimilis* (Jordan)	---; ---; 5, 62	da Costa Lima & Hathaway	1946

TABLE 1 - FLEAS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TRICHOPSYLLA quirini (Rothschild)	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
setosus Rothschild	---; ---; 62	Spencer	1936
sibynus (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
sinoma (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
telchinum (Rothschild)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
thamba (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
	---; ---; 62*	Brown	1944
vison (Baker)	---; ---; 5, 62, 323	da Costa Lima & Hathaway	1946
wagneri ophidius (Jordan)	---; ---; 323	da Costa Lima & Hathaway	1946
wagneri systalta (Jordan)	---; ---; 62	da Costa Lima & Hathaway	1946
wagneri wagneri (Baker)	---; ---; 62, 323	da Costa Lima & Hathaway	1946
TRICHOPSYLLOIDES hubbardi (Jordan	---; ---; 323	da Costa Lima & Hathaway	1946
oregonensis Ewing	---; ---; 62, 323	Holland	1949
TUNGA penetrans (Linnaeus)	---; ---; 323° (Burrowed females cause intense itching and inflammation, ulceration, secondary infection, tetanus or gangrene may result)	Hubbard	1947
XENOPSYLLA cheopis (Rothschild)	---; ---; 62 (Most efficient vector for plague, murine typhus)	Hubbard	1947
	---; ---; 62 (Experimentally infected with sylvatic plague)	Mail & Holland	1942

TABLE 1 - FLEAS (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
XENOPSYLLA cheopis (Rothschild) (cont.)	---; abundant in dry season, common in summer and fall, minimum in March and maximum in Aug.; 323	Davis	1950
	---; in buildings, principle vector of murine typhus rickettsiae; 323*[c]	Good & Kotcher	1949
	---; experimental vector of plague, experimentally and naturally infected with plague; 323	Pratt & Wiseman	1962
	---; experimentally infected with and experimental vector of *Salmonella enteritidis*; 323	Eskey et al.	1949
	---; experimentally infected with both *Pasteurella pestis* and *Salmonella*; 323	Eskey et al.	1951
	---; transmits endemic typhus; 323*[c]	Dyer et al.	1932
	---; all year, suspected vector of typhus; 323	Strandtmann & Eben	1953
	---; ---; 323*	Stark	1958
	---; ---; 323 (Principal vector of plague, vector of *Rickettsia typhi*, probable vector of *Pasteurella tularensis*, can transmit *Hymenolepis diminuta*)	Geary	1959

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY FLEAS

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
ECHIDNOPHAGA					
gallinacea (Westwood)	Endemic typhus				323
HOPLOPSYLLUS					
anomalus (Baker)				Plague	323
OPISOCROSTIS					
bruneri (Baker)				Plague	323
labis (Jordan & Rothschild)				Plague	323
tuberculatus tuberculatus (Baker)				Plague	323
sexdentus agilis (Rothschild)				Plague	62
OROPSYLLA					
idahoensis (Baker)				Plague	62
labis (Jordan & Rothschild)				Plague	62
rupestris (Jordan)				Plague	62, 323
tuberculata tuberculata (Baker)				Plague	62
PULEX				Plague	62, 323
irritans (Linnaeus)				Flea allergy	323
THRASSIS					
acanantis (Rothschild)				Plague	62
bacchi (Rothschild)				Plague	323

TABLE 2 - FLEAS (conclusion)

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
CHRASSIS					
gladiolis					
gladiolis (Jordan)				Plague	62
petiolatus (Baker)				Plague	62
TRICHOPSYLLA					
eumolpi					
eumolpi (Rothschild)				Plague	62
thamba (Jordan)				Plague	62
XENOPSYLLA				Plague	323 (Stark, 1958)
cheopis (Rothschild)	Endemic typhus				323 (Dyer et al., 1932)
	Murine typhus rickettsiae				323 (Good & Kotcher, 1949)

LITERATURE CITED

Barnes, A. M.
1965. Three new species of the genus *Anomiopsyllus* (Siphonaptera: Hystrichopsyllidae). Pan-Pacif. Ent. 41(4):272-280.

Bishopp, F. C.
1915. Fleas. Bull. U. S. Dep. Agric. no. 248. 31 p.

Brown, J. H.
1944. The fleas (Siphonaptera) of Alberta, with a list of the known vector of sylvatic plague. Ann. ent. Soc. Amer. 37(2):207-2[illegible]

Buckner, C. [illegible].
1944. Fleas (Siphonaptera) of Manitoba mammals. Canad. Ent. 96(6):850-856.

Cole, L. C. & J. A. Koepke
1946. A study of rodent ectoparasites in Mobile, Ala. Publ. Hlth Rep., Wash. 61(41):1469-1487.

da Costa Lima, A. & C. R. Hathaway
1946 Pulgas: Bibliografía catálogo e hospedadores. Monogr. Inst. Osw. Cruz. no. 4. 522 p.

Dyer, R. E., E. T. Ceder, A. Rumreich & L. F. Badger
1932. Endemic typhus of the United States. J. infect. Dis. 51(1):137-161.

Eads, R. B.
1949. Recent collections of Colorado fleas. J. econ. Ent. 42(1).144 p.

Eddy, G. W.
1943. Some fleas collected from the Oklahoma cottontail rabbit, *Sylvilagus floridanus alacer* (Bangs). J. Kans. ent. Soc. 16(1):1-3.

Eskey, C. R., F. M. Prince & F. B. Fuller
1949. Transmission of *Salmonella enteritidis* by the rat fleas *Xenopsylla cheopis* and *Nosopsyllus fasciatus*. Publ. Hlth Rep., Wash. 64(30):933-941.

_____, _____ & _____.
1951. Double infection of the rat fleas *X. cheopis* and *N. fasciatus* with *Pasteurella* and *Salmonella*. Publ. Hlth Rep., Wash. 66(41):1318-1326.

Ewing, [illegible] E.
1929. Notes on the Siphonapteran genus *Catallagia* Rothschild, including the description of a new species. Proc. biol. Soc. Wash. 42(8):125-127.

_____. & I. Fox
1943. The fleas of North America. Classification, identification, and geographic distribution of these injurious and disease-spreading insects. Misc. Publ. U. S. Dep. Agric. no. 500. 142 p.

Fox, I.
1940. Fleas of eastern United States. Iowa State College Press, Ames, Iowa. 191 p.

Fuller, H. S.
1943. Studies on Siphonaptera of eastern North America. Bull. Brooklyn ent. Soc. 38(1):18-23.

Geary, J. M.
1959. The fleas of New York. Mem. Cornell agric. Exp. Sta. no. 355. 194 p

Good, N. E. & E. Kotcher
1949. Murine typhus fever in Louisville, Kentucky. Pub. Hlth Rep., Wash. 64(8):229-237.

Hill, E. L. & S. C. Ingraham II.
1947. A study of murine typhus fever in Coffee County, Alabama. Publ. Hlth Rep., Wash. 62(24):875-881.

Holland, G. P.
1944. The distribution of some plague-important rodents and fleas in western Canada (Mammalia: Rodentia and Insecta: Siphonaptera). Proc. ent. Soc. B. C. 41:5-12.

_____.
1949. The Siphonaptera of Canada. Publ. Dep. Agric. Can. no. 817. 306 p.

Hubbard, C. A.
1940. American mole and shrew fleas (a new genus, three new species). Pacif. Univ. Bull. 37(2):12 p.

_____.
1943. The fleas of California with checklists of the fleas of Oregon, Washington, British Columbia, Alaska, Idaho, Nevada, Arizona. Pacif. Univ. Bull. 39(8):12 p.

_____
1947. Fleas of western North America. Their relation to the public health. Iowa State College Press, Ames, Iowa. 533 p.

Jameson, E. W. Jr.
1946. A new species of *Epitedia* Jordan (Siphonaptera). J. Kans. ent. Soc. 19(2):62-65.

Jellison, W. L.
1945. Siphonaptera: a new species of *Conorhinopsylla* from Kansas. J. Kans. ent. Soc. 18(3):109-111.

_____.
1947. Siphonaptera: host distribution of the genus *Opisocrostris* Jordan. Trans. Amer. micr. Soc. 66(1):64-69.

_____. & N. E. Good
1942. Index to the literature of Siphonaptera of North America. Bull. nat. Inst. Hlth, Wash. no. 178. 193 p.

_____. & G. M. Kohls
1939. Siphonaptera: a list of Alaskan fleas. Publ. Hlth Rep., Wash. 54(45):2020-2023.

_____., _____, & H. B. Mills
194[illegible]. Siphonaptera. Species and host list of Montana fleas. Misc. Publ. Mont. Bd Ent. no. 2. 22 p.

_____., B. Locker & R. Bacon
1953. A synopsis of North American fleas, North of Mexico, and notice of a supplementary index. J. Parasit. 39(6):610-618.

Johnson, P. T.
1957. A classification of the Siphonaptera of South America with descriptions of new species. Mem. ent. Soc. Wash. no. 5. 299 p.

Jordan, K.
1932. Die aus der arktischen Zone bekannten Flöhe. Fauna arct., Jena. 6(2):116-118.

Jordan, K.
1932a. Siphonaptera collected by Mr. Harry S. Swarth at Atlin in British Columbia. Novit. zool. 38(1):253-255.

_____. & N. C. Rothschild
1920. On the species and genera of Siphonaptera described by Kolenati. Ectoparasites. 1(2):61-125.

_____. & _____.
1921. On *Ceratophyllus fasciatus* and some allied Indian species of fleas. Ectoparasites. 1(3):178-198.

_____. & _____.
1922. New Siphonaptera. Ectoparasites. 1(4):266-283.

_____. & _____.
1923. New American Siphonaptera. Ectoparasites. 1(5):309-319.

Kohls, G. M.
1938. Two new species of *Meringis* Jordan (Siphonaptera). Publ. Hlth Rep., Wash. 53(28):1216-1220.

Layne, J. N.
1958. Records of fleas (Siphoptera) from Illinois mammals. Nat. Hist. Misc. 162:7 p.

Linsdale, J. M. & B. S. Davis
1956. Taxonomic appraisal and occurrence of fleas at the Hastings Reservation in central California. Univ. Calif. Publs Zool. 54(5):293-370.

Liu, C. Y.
1936. Catalogue of Chinese Siphonaptera. Lingnan Sci. J. 15(3-4):379-390.

Macchiavello, A.
1954. Reservoirs and vectors of plague. J. trop. Med. Hyg. 57(1-12):220-224.

Mail, G. A. & G. P. Holland
1942. Siphonaptera of western Canada in relation to sylvatic plague. Proc. 6th Pacif. Sci. Congr 1939. 5:125-128.

Mathewson, J. A. & K. E. Hyland
1964. The ectoparasites of Rhode Island mammals. III. A collection of fleas from nondomestic hosts (Siphonaptera). J. Kans. ent. Soc. 37(2):157-163.

Pettit, R. H.
1923. Report of the section of entomology. Rep. Mich. Bd. Agric. pp. 211-214.

Pratt, H. D. & J. E. Lane
1950. Rediscovery of *Tarsopsylla coloradensis* (Baker) in Colorado (Siphonaptera, Dolichopsyllidae). Proc. ent. Soc. Wash. 52(6):305-307.

_____. & J. S. Wiseman
1962. Fleas of public health importance and their control. Publ. Hlth Serv. Publ., Wash. 772:36 p.

Prince, F. M.
1943. Report on the fleas *Opisocrostis bruneri* (Baker) and *Thrassis bacchi* (Roths.) as vectors of plague. Publ. Hlth Rep., Wash. 58(27):1013-1016.

Randolph, N. M. & R. B. Eads
1947. An ectoparasitic survey of mammals from Lavaca County, Texas. Ann. ent. Soc. Amer. 39(4):597-601.

Robinson, G. H.
1913. The rats of Providence (R.I.) and their parasites. Amer. J. publ. Hlth pp. 773-776.

Sidwell, R. W., D. L. Lundgren, J. B. Bushman & B. D. Thorpe
1964. The occurrence of a possible epizootic of Q fever in fauna of the Great Salt Lake Desert of Utah. Am. J. trop. Med. Hyg. 13(5):754-762.

Smit, F. G. A. M.
1958. A new North American bird-flea. Proc. U. S. nat. Mus. 108(3394):51-57.

Spencer, G. J.
1936. A check list of the fleas of British Columbia with a note on fleas in relation to sawdust in homes. Proc. ent. Soc. B. C. no. 32. 11-17 p.

_____.
1937. The menace of rat parasites in Vancouver in 1936. Proc. ent. Soc. B. C. no. 33. 44-45 p.

Stark, H. E.
1958. The Siphonaptera of Utah, their taxonomy, distribution, host relations and medical importance. U. S. Dept. of Health, Education and Welfare, Public Health Service, Bureau of State Services, Communicable Disease Center, Atlanta, Ga. 239 p.

Strandtmann, R. W. & D. J. Eben
1953. A survey of typhus in rats and rat ectoparasites in Galveston, Texas. Tex. Rep. Biol. Med. 11(1):144-151.

Svihla, R. D.
1941. A list of the fleas of Washington. Univ. Wash. Publs Biol. 12(2):9-19.

Trembley, H. L. & F. C. Bishopp
1940. Distribution and hosts of some fleas of economic importance. J. econ. Ent. 33(4):701-703.

Wagner, J.
1936. The fleas of British Columbia. Canad. Ent. 68(9):193-207.

Wayson, N. E.
1947. Plague-field surveys in western United States during ten years (1936-1945). Publ. Hlth Rep., Wash. 62(22):780-791.

Weber, N. A.
1950. A survey of the insects and related arthropods of Arctic Alaska. Part I. Trans. Amer. ent. Soc. 76(3):147-206.

Williams, L. A. & C. C. Hoff
1951. Fleas from the Upper Sonoran Zone near Albuquerque, N. Mexico. Proc. U. S. nat. Mus. 101(3278):305-313.

Yeh, J. & D. E. Davis
1950. Seasonal changes in abundance of fleas on rats at Baltimore, Md. Pub. Hlth Rep., Wash. 65(10):337-342.

I. BUGS

The bugs or Hemiptera seem to be uncommon as pests of man in North America. The few entries comprise a variety of species, several of which are not obligated blood feeders.

Only 30 species or subspecies are listed in this group.

TABLE 1 - BUGS

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
CIMEX *lectularius* Linnaeus	---; in houses, July; 62	Ross	1916
	---; ---; 62°	Spencer	1935
	---; nocturnal, hiding during day in cracks of beds, behind wallpaper, objects hanging on walls; 323	Flint	1922
	---; in houses, summer; 323	Harned & Allen	1925
	---; ---; 323°	Cooley	1915
pilosellus Horvath	---; occasionally in houses; 323°	Stearns	1937
CIMEXOPIS *nyctalis* List	---; in houses; 323	List	1925
HAEMATOSIPHON *inodorus* Duges	---; April-June; 323°	Anonymous	1944
HASPEROCIMEX *coloradensis* List	---; in houses; 323	List	1925
LYCTOCORIS *carpentris* (Fabricius)	---; ---; 351 (Occasionally in houses where it bites man)	Strong et al.	1926
MELANOLESTES *abdominalis* Herrich-Schaeffer	---; ---; 351°	Strong et al.	1926
pictipes Herrich-Schaeffer	---; ---; 351°	Strong et al.	1926
OECIACUS *vicarius* Horvath	---; ---; 62°	Spencer	1935
	---; in buildings; 323°	Mills & Pletsch	1941
	---; ---; 351°	Strong et al.	1926
PARATRIATOMA *hirsuta* Barber	---; experimentally infected with *Trypanosoma cruzi*; 323	Usinger	1944
	---; ---; 323*	Wood	1949

TABLE 1 - BUGS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
PLAGIOGNATHUS *obscurus* Uhler	---; ---; 351°	Strong et al.	1926
RASAHUS *biguttatus* (Say)	---; in houses; 323	Strong et al.	1926
thoracicus Stål	---; in houses; 323	Strong et al.	1926
TRIATOMA *ambigua* Neiva	---; naturally infected with *Trypanosoma cruzi*; 323	Sullivan et al.	1949
gerstaeckeri (Stål)	In wood rat nest; houses; 323*	Wood	1941
	---; naturally infected with *Trypanosoma cruzi*; 323	Usinger	1944
heidemanni Neiva	In wood rat nest; ---; 323*	Wood	1941
	---; bites cause fever and nausea: 323°	Del Ponte	1930
	---; naturally infected with *Trypanosoma cruzi*; 323	Packchanian	1940
	---; in houses; 323	Readio	1927
indictiva Neiva	Rat nest; ---; 323*	Wood	1941
lectularius (Stål)	---; naturally infected with *Trypanosoma cruzi*; 323	Usinger	1944
longipes Barber	---; dens of wood rat, under houses, wood piles, in houses, May-June, bites man at night; 323°	Wehrle	1939
	---; restricted to rocky, hilly areas, naturally infected with *Trypanosoma cruzi*; 323	Wood	1943
	---; ---; 323*	Wood	1949
neotomae Neiva	---; naturally infected with *Trypanosoma cruzi*; 323	Sullivan et al.	1949
protracta (Uhler)	Brush-pile wood rat houses; in houses, naturally and experimentally infected with *Trypanosoma cruzi*; 323*	Wood	1949

TABLE 1 - BUGS (continued)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TRIATOMA protracta (Uhler) (cont.)	---; the bite causes pruritis all over, usually most severe on the scalp, palms and soles, or edema throughout the body, especially around eyes, tongue, larynx and trachea which often makes breathing and swallowing difficult, or welts and rashes, welts taking the form of large urticarial erythematous wheals or nausea, or fainting, pain, vomiting, fever, cramps and diarrhea, anywhere in the house, pockets of clothing, in shoes, under rugs, mostly in beds, bite mostly between 2400-0600, April-Nov., peak June-Sept.; 323*°	Walsh & Jones	1962
	---; in woodrat dens throughout the year, bites man at night; 323°	Wehrl	1939
protracta woodi Usinger	Wood rat houses; naturally infected with *Trypanosoma cruzi*; 323*	Wood	1949
	In cactus nest; in houses, from May-Sept.; 323	Wood	1941
rubida (Uhler)	In wood rat nest; in houses and tents, active in the early evening, May-Sept.; 323	Wood	1941
	---; naturally infected with *Trypanosoma cruzi*; 323	Wood	1943
	---; ---; 323*	Wood	1949
rubida uhleri Neiva	---; naturally infected with *Trypanosoma cruzi*; 323	Sullivan et al.	1949
rubrofasiata (De Geer)	---; ---; 323*	Pemberton	1943
sanguisuga (Le Conte)	---; cracks and insect tunnels in dead wood inside hollow oak trees or stumps, human habitations, in beds, outdoor latrines, naturally infected with *Trypanosoma cruzi*; 323	Olsen et al.	1964
	---; nests of woodrat built beneath loose stone along lime outcrops, feed at night; 323°	Grundemann	1947
	---; experimentally infected with *Trypanosoma cruzi*; 323	Usinger	1944
	---; all year; 323	Froeschner	1944
	---; ---; 323*	Wood	1941
sanguisuga ambigua Neiva	---; naturally infected with *Trypanosoma cruzi*; 323	Neiva & Lent	1941
	---; experimentally infected with *Trypanosoma cruzi*; 323°	Packchanian	1940

TABLE 1 - BUGS (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TRIATOMA			
sanguisuga indictiva Neiva	---; experimentally infected with *Trypanosoma cruzi*; 323	Usinger	1944
uhleri Neiva	---; nymph and adult bites man at night, bite causes swelling, rash and fever, enter houses in May and June; 323[a]	Wehrle	1939
	---; naturally infected with *Trypanosoma cruzi*; 323	Packchanian	1940
TRIPHLEPS			
insidiosus (Say)	---; ---; 351[a]	Strong et al.	1926

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY BUGS

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
PARATRIATOMA					
hirsuta Barber		Chagas' disease			323
TRIATOMA					
gerstaeckeri (Stål)		Chagas' disease			323
heidemanni Neiva		Chagas' disease			323
indictiva Neiva		Chagas' disease			323
longipes Barber		Chagas' disease			323
protracta (Uhler)				Sensitized reactions	323 (Walsh & Jones, 1962)
		Chagas' disease			323
protracta woodi Usinger		Chagas' disease			323
rubida (Uhler)		Chagas' disease			323
rubrofasciata (DeGeer)		Trypanosomiasis			323
sanguisuga (LeConte)		Chagas disease			323

LITERATURE CITED

Anonymous
1944. Entomology and economic zoology. 54th Rep. Ariz. agric. Exp. Sta. pp. 51-53.

Cooley, R. A.
1915. Twelfth annual report of the state entomologist of Montana. Bull. Mont. agric. Exp. Sta. no. 102. 197-208 p.

Del Ponte, E.
1930. Catálogo descriptivo de los géneros *Triatoma* Lap., *Rhodnius* Stål y *Eratyrus* Stål. Rev. Inst. bact., B. Aires. 5(8):885-937.

Flint, W. P.
1927. The control of household insects. Circ. Ill. agric. Exp. Sta. no. 257. 24 p.

Froeschner, R. C.
1944. Contribution to a synopsis of the hemiptera of Missouri, Pt. III. Lygaeidae, Pyrrhocoridae, Piesmidae, Tingididae, Enicocephalidae, Phymatidae, Ploiariidae, Reduviidae, Nabidae. Amer. Midl. Nat. 31(3):638-683.

Grundemann, A. W.
1947. Studies on the biology of *Triatoma sanguisuga* (Leconte) in Kansas (Reduviidae, Hemiptera). J. Kans. ent. Soc. 20(3):77-85.

Harned, R. S. & H. W. Allen
1925. Controlling bedbugs in steam-heated rooms. J. econ. Ent. 18(2):320-329.

List, G. M.
1925. Three new genera and three new species of Cimicidae from North America. Proc. biol. Soc. Wash. 38(23):103-110.

Mills, H. B. & D. J. Pietsch
1941. Another infestation of a school building by *Oeciacus vicarius* Horvath. J. econ. Ent. 34(4):575 p.

Neiva, A. & H. Lent
1941. Sinopse dos triatomideos. Rev. Ent., Rio de J. 12(1-2):61-92.

Olsen, P. F., J. P. Shoemaker, H. F. Turner & K. L. Hays
1964. Incidence of *Trypanosoma cruzi* (Chagas) in wild vectors and reservoirs in east-central Alabama. J. Parasit. 50(5):599-603.

Packchanian, A.
1940. Experimental transmission of *Trypanosoma cruzi* infection in animals by *Triatoma sanguisuga ambigua*. Publ. Hlth Rep., Wash. 55(34):1526-1532.

Pemberton, C. E.
1943. Insects and other arthropods of medical interest in Hawaii. Hawaii med. J. March-April. pp. 191-194.

Readio, P. A.
1927. Biology of the Reduviidae of America north of Mexico. Kan. Univ. Sci. Bull. 17(1):291 p.

Ross, W. A.
1916. Popular and practical entomology--eradication of the bedbug by superheating. Canad. Ent. 48(3):74-76.

Spencer, G. J.
1935. The bed-bugs of British Columbia. Proc. ent. Soc. B. C. no. 31. 43-45 p.

Stearns, L. A.
1937. Important insects of the year. Bull. Del. agric. Exp. Sta. no. 207. 29-30 p.

Strong, R. P., G. C. Shattuck, J. C. Bequaert & R. E. Wheeler
1926. Medical report of the Hamilton Rice Seventh Expedition to the Amazon, in conjunction with the Department of Tropical Medicine of Harvard University, 1924-1925. Contr. Harv. Inst. trop. Biol. Med. no. 4. 313 p.

Sullivan, T. D., T. MacGregor, R. B. Eads & D. J. Davis
1949. Incidence of *Trypanosoma cruzi* Chagas, in *Triatoma* (Hemiptera,Reduviidae) in Texas. Amer. J. trop. Med. 29(4):453-458.

Usinger, R. L.
1944. The Triatominae of North and Central America and the West Indies and their public health significance. Publs.publ. Hlth Serv., Wash. no. 288. 83 p.

Walsh, J. E. & J. P. Jones
1962. Public health significance of the cone-nosed bug, *Triatoma protracta* (Uhler), in the Sierra Nevada foothills of California. Calif. Vector Views. 9(7):33-37.

Wehrle, L. P.
1939. Observations on three species of *Triatoma* (Hemiptera:Reduviidae). Bull. Brooklyn ent. Soc. 34(3):145-154.

Wood, S. F.
1941. Notes on the distribution and habits of Reduviid vectors of Chagas' Disease in the southwestern United States (Hemiptera,Reduviidae). Pan-Pacif. Ent. 17(2-3):85-94.

_____.
1943. Observation on vectors of Chagas' Disease in the United States. II. Arizona. Amer. J. trop. Med. 23(3):315-320.

_____.
1949. Additional observations on *Trypanosoma cruzi* Chagas, from Arizona in insects, rodents, and experimentally infected animals. Amer. J. trop. Med. 29(1):43-55.

J. URTICATING AND VESICATING ARTHROPODS

The entries for urticating and vesicating arthropods are surprisingly few. Only 9 species are listed.

TABLE 1 - URTICATING AND VESICATING ARTHROPODS

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
APATELA *americana* Harris	---; ---; 323*	Larson	1927
AUTOMERIS *io* (Fabricius)	---; ---; 323*	Foot	1922
EUPROCTIS *chrysorrhoea* Linnaeus	---; ---; 323*	Foot	1922
HEMILEUCA *maia* Drury	---; ---; 323*	Foot	1922
nevadensis Stretch	--; ---; 323*	Caffrey	1918
oliviae Cockerell	---; ---; 323*	Caffrey	1918
LOGOA *crispata* Packard	---; ---; 323*	Foot	1922
MEGALOPYGE *opercularis* Abbot & Smith	---; ---; 323*	Foot	1922
SIBINE *stimulea* Clemens	---; ---; 323*	Foot	1922

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY URTICATING AND VESICATING ARTHROPODS

SPECIES	DISEASE ORGANISM				DISTRIBUTION
	VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	
APATELA *americana* Harris				Dermatitis	323
AUTOMERIS *io* (Fabricius)				Urtication	323
EUPROCTIS *chrysorrhoea* Linnaeus				Urtication	323
HEMILEUCA *maia* Drury				Urtication	323
nevadensis Stretch				Urtication	323
oliviae Cockerell				Urtication	323
LAGOA *crispata* Packard				Urtication	323
MEGALOPYGE *opercularis* Abbot & Smith				Dermatitis	323
SIBINE *stimulea* Clemens				Urtication	323

LITERATURE CITED

Caffrey, D. J.
1918. Notes on the poisonous urticating spines of *Hemileuca oliviae* larvae. J. econ. Ent. 11(4):363-367.

Foot, N. C.
1922. Pathology of the dermatitis caused by *Megalopyge opercularia*, a Texan caterpillar. J. exp. Med. 35(5):737-753.

Larson, A. O.
1927. Another poisonous caterpillar. J. econ. Ent. 20(4):647 p.

K. TICKS

The tick entries seldom include information on the immature forms separately from the adults. In fact, most of the entries contain only distributional data.

Ticks are important livestock pests in America; also, some serious disease organisms are transmitted by ticks. In the table are listed 110 species or subspecies.

TABLE 1 - TICKS

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AMBLYOMMA americanum (Linné)	Among grasses; 62. ---; 323*	Gregson	1956
	Suspected vector of Rocky Mountain spotted fever, tularemia and Bullis fever, naturally infected with causative organism of Rocky Mountain spotted fever, American Q fever; 323°	Cooley & Kohls	1944 a
	Vector of spotted fever, potential vector of tularemia, abundant in woodlands, active February-Sept., peak late May or early July; 323	Brennan	1945
	Attached to man in all its active stages, naturally infected with *Rickettsia diaphorica*; 323*°	Bishopp & Trembley	1945
	Experimental transmission of *Bacterium tularense*, possible vector of spotted fever; 323	Parker	1934
	Experimental transmission of Rocky Mountain spotted fever; 323	Bequaert	1946
	Experimental transmission of tularemia; 323	Parker et al.	1937
	---; 323**	Ransmeier	1949
avecolens Cooley & Kohls	---; 323	Cooley & Kohls	1944 a
cajennense (Fabricius)	---; 62°	Gregson	1956
	Experimental carrier of Rocky Mountain spotted fever; 323	Philip	1939 a
	Active all year; 323°	Bishopp & Trembley	1945
dissimile Koch	---; 323	Cooley & Kohls	1944 a
inornatum (Banks)	---; 323	Cooley & Kohls	1944 a
maculatum Koch	Naturally infected with Rocky Mountain spotted fever; 323	Bequaert	1946
	Abundant within 100 miles of the coast; 323	Bishopp & Trembley	1945
	Active during summer; 323	Hixson	1939
	---; 323*	Gregson	1956
	---; 323°	Cooley & Kohls	1944 a
ovale Koch	---; 323	Eddy & Joyce	1942

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
AMBLYOMMA			
tuberculatum Marx	---; 323	Bishopp & Trembley	1945
ANTRICOLA			
coprophilus (McIntosh)	---; 323	Cooley & Kohls	1944
APONOMMA			
elaphensis Price	---; 323	Price	1958
ARGAS			
brevipes Banks	Jan.; 323	Kohls et al.	1961
cooleyi Kohls & Hoogstraal	In houses, April, June-Oct., Dec.; 323	Kohls & Hoogstraal	1960
miniatus Koch	---; 323°	Bishopp & Trembley	1945
persicus (Oken)	---; 62, 323 (Bite on man may cause severe pain, shock, delirium and even death)	Gregson	1956
reflexus Fabricius	---; 62	Gregson	1956
	---; 323	Cooley & Kohls	1944
BOOPHILUS			
annulatus (Say)	---; 323	Cooley	1946
annulatus australis (Fuller)	---; 323	McIntosh	1934
annulatus microplus (Canestrini)	---; 323	Tate	1941
microplus (Canestrini)	---; 323	Clifford et al.	1961
CERATIXODES			
signatus Birula	---; 5, 323	Chamberlain	1937
DERMACENTOR			
albipictus (Packard)	Occurs abundantly in late autumn among ends of grasses and twigs, along trails and at resting haunts; 62°. ---, 323*. ---; 327	Gregson	1956

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DERMACENTOR albipictus (Packard) (cont.)	Confined to the mountains; 62	Brown & Kohls	1950
	Experimental transmission of Rocky Mountain spotted fever; 323	Cooley	1938
andersoni (Stiles)	Under stones, around crown of grass plants, naturally infected with tularemia and Rocky Mountain spotted fever, peak May; 62**°. Naturally infected with *Pasteurella tularensis*; 323	Brown	1944
	March-May, peak April, active all summer; 62*°	Gregson	1956
	Jan., Apr.-Sept.; 62. March-Sept., peak May; 323 (Greatest adult activity-Apr., May and June)	Jellison & Gregson	1947
	---; 62*, 323***	Ransmeier	1949
	---; 62, 323** (Abundant in open regions of low, bushy vegetation, scarce in heavily timbered area, grassland and prairie)	Parker et al.	1937
	Natural carrier of spotted fever virus, natural and experimental transmission of *Bacterium tularense*; 323	Parker	1934
	Experimental transmission of Rocky Mountain spotted fever; 323	Parker et al.	1952
	Naturally infected with *Rickettsia diaporica*; 323	Cox	1940
	---; 323*°	Smadel	1959
	---; 351*	Bishopp & Trembley	1945
erraticus albipictus (Packard)	---; 62, 323	Bequaert	1946
erraticus erraticus (Say)	---; 323	Bequaert	1946
halli McIntosh	---; 323	Cooley	1938
hunteri Bishopp	At an altitude of 1,500-2,000 feet, July-Dec.; 323	Bishopp & Trembley	1945

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DERMACENTOR			
modestus Banks	---; 323	Fricks	1915
nigrolineatus Packard	Active Nov.-March, peak Dec. or Jan.; 323	Parish & Rude	1946
nitens Neumann	---; 323	Rees	1934
occidentalis Marx	---; 62, 323 (Found on man, vector of tularemia)	Chamberlain	1937
	Carrier of spotted fever, naturally and experimentally infected with *Bacterium tularense*; 323	Parker	1934
	Experimentally infected with Rocky Mountain spotted fever, naturally infected with tularemia; 323°	Bishopp & Trembley	1945
	Naturally infected with *Rickettsia diaporica*; 323	Cox	1940
parumapertus Neumann	Naturally infected with *Coxiella burnetti*; 323	Sidwell et al.	1964
	Suspected vector of Rocky Mountain spotted fever; 323°	Cooley	1938
	Experimental transmission of tularemia; 323	Parker et al.	1937
parumapterus marginatus Banks	Experimental transmission of spotted fever and *Bacterium tularense*; 323	Parker	1934
variabilis (Say)	---; 5. Natural carrier of spotted fever virus; 323	Parker et al.	1933
	In houses; 62**°. Experimental transmission of St. Louis encephalitis; 323	Gregson	1956
	Bites man in areas covered with high grass or brush, along roads, paths and trails, all year, peak May-June; 323°	MacCreary	1945
	Naturally infected with causative organisms of Rocky Mountain spotted fever and tularemia; 323*	Bequaert	1946
	Adult occasionally found in grass, door, door jamb, timber sides; 323*	Collins et al.	1949

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
DERMACENTOR variabilis (Say) (cont.)	Beneath loose bark of trees and logs in well-drained areas; 323	Miller	1945
	Capable of transmitting eastern type of spotted fever; 323	Dyer et al.	1932
	Experimental transmission of western strain of Rocky Mountain spotted fever; 323	Arthur	1960
	Larvae and nymph active April-Sept., adult active April-Sept.; 323	Smith et al.	1946
	Experimental transmission of *Bacterium tularense*; 323*	Parker	1934
	Active April-Sept., peak June; 323	Bishopp & Smith	1938
	Active all year; 323	Portman	1944
	---; 323*°	Cooley	1938
venustus Banks	---; 62*. Naturally infected with tularemia; 323*	Bequaert	1946
	---; 62°	Hewitt	1915
	Larvae active May through Aug., nymph active April through Aug., adults active March through Aug., and adults abundant April through June; 323	Parker	1916
HAEMAPHYSALIS chordeilis (Packard)	Common; 62°	Gregson	1956
	---; 62. Naturally infected with tularemia; 323	Bequaert	1946
	---; 323*°	Cooley	1946
cinnabarina Koch	---; 62*	Ransmeier	1949
	---; 62°.	Hewitt	1915
	Naturally infected with *Bacterium tularense*; 323	Parker	1934
expositicius Koch	---; 62, 323	Hewitt	1915
leporis-palustris (Packard)	Naturally infected and experimental transmission of tularemia; 5	Philip	1939
	Possible vector of tularemia; 5. ---; 323*	Fairchild	1945
	Common and widely distributed; 62*	Gregson	1956
	---; 62°	Brown & Kohls	1950

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
HAEMAPHYSALIS leporis-palustris (Packard) (cont.)	Rarely bites man, natural vector of Rocky Mountain spotted fever and tularemia; 323°	Cooley	1946
	Carrier of spotted fever, naturally and experimentally infected with *Bacterium tularense*; 323	Parker	1934
	Experimentally infected with Rocky Mountain spotted fever; 323	Parker et al.	1952
	Naturally infected with and experimental transmission of tularemia; 323	Bequaert	1946
	Active all year: 323**	Portman	1944
IXODES			
aequalis Banks	---; 323	Harkema	1936
affinis Neumann	---; 323	Gerrish & Ossorio	1965
angustus Neumann	---; 5, 62	Bequaert	1946
	Common; 62°	Gregson	1956
	---; 323°	Bishopp & Trembley	1945
angustus woodi Bishopp	---; 323	Harkema	1936
auritulus Neumann	---; 62	Hearle	1938
	---; 250	Gregson	1956
	---; 323	Cooley & Kohls	1945
baergi Cooley & Kohls	---; 323	Cooley & Kohls	1945
banksi Bishopp	---; 62	Gregson	1956
	---; 323	Cooley & Kohls	1945
bishoppi Smith & Gouck	---; 323	Smith & Gouck	1947
brunneus Koch	---; 323	Cooley & Kohls	1945

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
IXODES	---; 323°	Chamberlain	1937
californicus Banks	---; 323	Cooley & Kohls	1945
conepati Cooley & Kohls	---; 323	Cooley & Kohls	1945
cookei Packard	---; 62°	Gregson	1956
	---; 62, 323	Cooley & Kohls	1945
	Rarely bites man; 323°	Bishopp & Trembley	1945
cookei var. *rugosus* Bishopp	March, May-Nov.; 323	Bishopp & Trembley	1945
dentatus Marx	Experimentally infected with Rocky Mountain spotted fever and tularemia; 323	Parker et al.	1952
	All year, peak April-July; 323	Bishopp & Trembley	1945
dentatus spinipalpus Nuttall & Hadwen	---; 62°	Hearle	1938
diversifossus Neumann	---; 323	Bishopp & Trembley	1945
endyptidis signatus (Birula)	---; 7	Yakimoff	1922
hearlei Gregson	---; 62	Gregson	1956
	---; 323	Cooley & Kohls	1945
hexagonus Leech	---; 62, 323	Hewitt	1915
	---; 323°	Hatch	1938
hexagonus cookei Packard	---; 62, 323	Hewitt	1915

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
IXODES			
hirsutus Birula	---; [7]	Yakimoff	1922
holdenriedi Cooley	---; 323	Cooley	1946 a
howelli Cooley & Kohls	---; 323	Kohls	1947 a
jellisoni Cooley & Kohls	---; 323	Cooley & Kohls	1945
kingi Bishopp	---; 62	Cooley & Kohls	1945
	Naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
lorisatus Neumann	---; 323	Harkema	1936
marmotae Cooley & Kohls	---; 62, 323	Cooley & Kohls	1945
marxi Banks	---; 62	Cooley & Kohls	1945
	May; 323	MacCreary	1945
minor Neumann	---; 323	Clifford et al.	1961
muris Bishopp & Smith	---; 62, 323	Bequaert	1946
	---; 323[c]	Clifford et al.	1961
murreleti Cooley	---; 323	Cooley & Kohls	1945
neotomae Cooley	---; 323	Cooley & Kohls	1945
pehotonae Gregson	---; 62, 323	Cooley & Kohls	1945
ozarkus Cooley	---; 323	Cooley & Kohls	1945

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
IXODES *pacificus* Cooley & Kohls	Damp, sunny, rocky slopes with vegetation, bite is painful and slow-healing on man, active from early fall to late spring, 62°	Gregson	1956
	Naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
	---; 323°	Cooley & Kohls	1945
peromyscl Auguston	---; 323	Cooley & Kohls	1945
pratti Banks	---; 62	Hewitt	1915
purus Pickard-Cambridge	---; 62	Hearle	1938
ricinus (Linnaeus)	---; 62°	Hearle	1938
	---; 323°	Chamberlain	1937
ricinus *californicus* (Banks)	---; 62°	Bishopp & Trembley	1945
	Naturally infected with tularemia; 323°	Parker et al.	1937
ricinus *scapularis* Say	---; 62°, 323°	Bishopp & Trembley	1945
	October-March; 323	Hixson	1939
rugosus Bishopp	---; 62	Gregson	1956
	---; 323	Cooley & Kohls	1945
scapularis Say	---; 323°	Cooley & Kohls	1945
	---; 323	Gregson	1956
sculptus Neumann	---; 62	Cooley & Kohls	1945
	Rodent's burrows; 323	Bishopp & Trembley	1945
signatus Birula	---; 5, 7, 62, 323	Gregson	1956

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
IXODES			
soricis Gregson	Mar., Sept.; 62. Dec.; 323	Gregson & Kohls	1952
spinipalpis Hadwen & Nuttall	---; 62°	Gregson	1956
	---; 62, 323	Cooley & Kohls	1945
texanus Banks	---; 62, 323	Bequaert	1946
tovari Cooley	---; 323	Eads & Walker	1952
urice White	---; 5, 62	Cooley & Kohls	1945
woodi Bishopp	---; 323	Cooley & Kohls	1945
MARGAROPUS			
annulatus Say	---; 323	Miller	1925
ORNITHODOROS			
aquilae Cooley	---; 323	Cooley	1944
concanensis Cooley & Kohls	---; 323	Cooley & Kohls	1944
cooleyi McIvor	---; 323	Cooley & Kohls	1944
coriaceus Koch	Experimentally infected with tularemia; 323°	Parker et al.	1937
dyari Cooley & Kohls	---; 323	Cooley & Kohls	1944
erenicus Cooley & Kohls	---; 323	Cooley & Kohls	1944
hermsi Wheeler, Herms & Meyer	Bird's nest, in crevices, in a house, possible vector of relapsing fever, bites by night; 62°	Gregson	1949
	In houses, disease carrier, bite on man occasionally progressing in the form of a severe transistory shock; 62°	Gregson	1956

TABLE 1 - TICKS (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ORNITHODOROS hermsi Wheeler, Herms & Meyer (cont.)	In houses, experimental transmission of relapsing fever, Oct.-Nov.; 323*°	Longanecker	1951
	Common at altitudes above 5000 feet in nonrodent-proof cabins or summer dwellings in the mountains; 323	Parker et al.	1937
	Experimental transmission of American "Q" fever; 323	Davis	1943
	Experimental transmission of Rocky Mountain spotted fever and American "Q" fever; 351	Cooley & Kohls	1944
kelleyi Cooley & Kohls	In houses; 323	Cooley & Kohls	1944
megnini (Dugès)	---; 62°, 323°	Bishopp & Trembley	1945
moubata (Murray)	Experimental transmission of American "Q" fever; 323	Davis	1943
nicolleti Mooser	---; 323	Cooley & Kohls	1944
parkeri Cooley	---; 62, 323*	Gregson	1956
	---; 323°. Experimental transmission of Rocky Mountain spotted fever; 351*	Cooley & Kohls	1944
	Experimentally infected with *Trypanosoma cruzi*; 323	Mazzotti & Osorio	1943
stageri Cooley & Kohls	Bites man readily; 323°	Cooley & Kohls	1944
talaje (Guerin-Meneville)	Experimentally infected with "Q" fever; 323	Irons et al.	1952
	In houses; 323	Parker et al.	1937
	---; 323°. ---; 351*	Cooley & Kohls	1944
turicata (Duges)	---; 323°. ---; 351*	Cooley & Kohls	1944
	---; 323*	Parker et al.	1937
yucatensis Cooley & Kohls	---; 323	Cooley & Kohls	1944

TABLE 1 - TICKS (conclusion)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
OTOBIUS lagophilus Cooley & Kohls	---; 62	Cooley & Kohls	1944
	---; 323*	Gregson	1956
megnini (Duges)	---; 62, 323 (Occasionally found in ear of man)	Cooley & Kohls	1944
	Bites man occasionally; 323°	Mills	1942
OTOCENTOR nitens (Neumann)	---; 323	Cooley	1938
RHIPICEPHALUS sanguineus (Latreille)	In houses, potential vector of Rocky Mountain spotted fever; 62°. Naturally infected with "Q" fever; 323	Gregson	1956
	Experimental transmission of Rocky Mountain spotted fever and *Trypanosoma cruzi*, seldom bites man; 323°	Bishopp & Trembley	1945
	Carrier of spotted fever virus, experimental transmission of *Bacterium tularense*; 323	Parker	1934
	Experimental transmission of tularemia; 323	Parker et al.	1937
	In houses; 323	Kohls	1947
	All year; 323	Hixson	1939

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY TICKS

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
AMBLYOMMA *americanum* (Linnaeus)	Rocky Mountain Spotted Fever				323 (Bishopp & Trembley, 1945)
	Spotted fever			Tularemia	323 (Ransmeier, 1949)
				Tick paralysis	323 (Gregson, 1956)
maculatum Koch				Tick paralysis	323
DERMACENTOR *albipictus* (Packard)	Colorado tick fever				323
andersoni (Stiles)				Tick paralysis	62
	Spotted fever			Tick paralysis & Tularemia	323
	Rocky Mountain Spotted Fever			Tularemia	62 (Brown, 1944)
	Colorado tick fever				62 (Gregson, 1956)
	Colorado tick fever & Rocky Mountain Spotted Fever				323 (Parker et al., 1937)
	Rickettsia rickettsii				323 (Smadel, 1959)
	Q. fever				351
variabilis (Say)	Rocky Mountain spotted fever			Tularemia	62
	Rocky Mountain spotted fever				323 (Collins et al.)
				Tick paralysis	323 (Bequaert, 1946)
				Tularemia	323 (Cooley, 1938)
	Spotted fever				323 (Parker, 1934)

TABLE 2 - TICKS (conclusion)

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
DERMACENTOR					
venustus Banks				Tick paralysis	62, 323
HAEMAPHYSALIS					
chordeilis (Packard)				Tick paralysis	323
cinnabarina Koch				Tick paralysis	62
leporis-palustris (Packard)				Tularemia	62
	Spotted fever			Tularemia	323
	Rocky mountain spotted fever				323 (Fairchild, 1943)
ORNITHODOROS					
hermsi Wheeler, Herms & Meyer				Relapsing fever	323
parkeri Cooley				Relapsing fever	323, 351
talaje (Guerin-Menebille)				Relapsing fever	351
turicata (Duges)				Relapsing fever	323, 351
OTOBIUS					
lagophilus Cooley & Kohls	Colorado tick fever				323

LITERATURE CITED

Arthur, D. R.
1960. Ticks. A monograph of the Ixodoidea. Part V. On the genera *Dermacentor*, *Anocentor*, *Cosmiomma*, *Boophilus* and *Margaropus*. Cambridge University Press, London. 251 p.

Bequaert, J. C.
1946. The ticks, or Ixodoidea, of the Northeastern United States and Eastern Canada. Ent. amer. (N.S.). 25(2):73-120, 25(3):121-184. 25(4):185-232.

Bishopp, F. C. & C. N. Smith
1938. The American dog tick, eastern carrier of Rocky Mountain Spotted Fever. Circ. U. S. Dep. Agric. no. 478. 25 p.

_____. & H. L. Trembley
1945. Distribution and hosts of certain North American ticks. J. Parasit. 31(1):1-54.

Brennan, J. M.
1945. Field investigations pertinent to Bullis Fever. The Lone Star Tick, *Amblyomma americanum* (Linnaeus, 1758). Notes and observations from Camp Bullis, Texas. Tex. Rep. Biol. Med. 3(2):204-226.

Brown, J. H.
1944. The spotted fever and other Albertan ticks. Canad. J. Res. (D). 22(2):36-51.

_____. & G. M. Kohls
1950. The ticks of Alberta with special reference to distribution. Canad. J. Res. 28(3):197-205.

Chamberlin, W. J.
1937. The ticks of Oregon. Bull. Ore. agric. Exp. Sta. no. 349. 34 p.

Clifford, C. M., G. Anastos & E. L. B. La Alena
1961. The larval Ixodid ticks of the eastern United States (Acarina-Ixodidae) May, 1961. Misc. Publs ent. Soc. Am. 2(3):215-237.

Collins, D. L., R. V. Nardy & R. D. Glasgow
1949. Some host relationships of Long Island ticks. J. econ. Ent. 42(1):110-112.

Cooley, R. A.
1938. The genera *Dermacentor* and *Otocentor* (Ixodidae) in the United States with studies in variation. Nat. Inst. Hlth Bull. no. 171. 89 p.

_____.
1944. *Ixodes ovatus* n. sp. and *Ornithodoros aquilae* n. sp., with notes on *O. talaji* and *O. kelleyi* (Ixodoidea). J. Parasit. 30(5):287-294.

_____.
1946. The genera *Boophilus*, *Rhipicephalus*, and *Haemaphysalis* (Ixodidae) of the New World. Nat. Inst. Hlth Bull. no. 187. 54 p.

_____.
1946a. Ixodes holdenriedi, a new species of tick from a pocket gopher in California. Pan-Pacif. Ent. 22(3):103-104.

Cooley, R. A. & G. M. Kohls
1944. The Argasidae of North America, Central America and Cuba. Amer. Midl. Nat. Monogr. no. 1. 152 p.

_____. & _____.
1944a. The genus *Amblyomma* (Ixodidae) in the United States. J. Parasit. 30(2):77-111.

_____. & _____.
1945. The genus *Ixodes* in North America. Nat. Inst. Hlth Bul. no. 184. 246 p.

Cox, H. R.
1940. *Rickettsia diaporica* and American Q fever. Amer. J. trop. Med. 20(4):463-469.

Davis, G. E.
1943. American Q Fever: experimental transmission by the Argasid ticks *Ornithodoros moubata* and *O. hermsi*. Publ. Hlth Rep., Wash. 58(26):984-987.

Dyer, R. E., E. T. Ceder, A. Rumreich & L. F. Badger
1932. Endemic typhus of the United States. J. infect. Dis. 51(1):137-151.

Eads, R. B. & O. L. Walker
1952. Texas records of the tick, *Ixodes tovari*, Cooley. J. Parasit. 38:368.

Eddy, G. W. & C. R. Joyce
1942. Ticks collected on the Tama (Iowa) Indian Reservation with notes on other species. Iowa St. Coll. J. Sci. 16(4):539-543.

Fairchild, G. B.
1943. An annotated list of the bloodsucking insects, ticks and mites known from Panama. Amer. J. trop. Med. 23(6):569-591.

Fricks, L. D.
1915. Rocky Mountain Spotted Fever found present in South-eastern Montana. Publ. Hlth Rep., Wash. 30(23):1694-1695.

Gerrish, R. R. & J. M. Ossorio
1965. New record of the tick *Ixodes affinis* in the United States. J. econ. Ent. 58(2):369 p.

Gregson, J. D.
1949. Notes on the occurrence of *Ornithodoros hermsi* in British Columbia, and its probable relation to relapsing fever. Argasidae, Ixodoidea. Proc. ent. Soc. B. C. 45:15-16 p.

_____.
1956. The Ixodoidea of Canada. Publ. Dep. Agric. Can. no. 930. 92 p.

_____. & G. M. Kohls
1952. The male of *Ixodes soricis* Gregson (Acarina:Ixodidae). Canad. Ent. 84(6):185-188.

Harkema, R.
1936. The parasites of some North Carolina rodents. Ecol. Monogr. 6(2):151-232.

Hatch, M. H.
1938. A bibliographical catalogue of the injurious Arachnids and insects of Washington. Univ. Wash. Publs Biol. 1(4):163-223.

Hearle, E.
1938. The ticks of British Columbia. Sci. Agric. 18(7):341-354.

Hewitt, C. G.
1915. A contribution to a knowledge of Canadian ticks. Trans. roy. Soc. Can. 3(9):225-239.

Hixson, H.
1939. Biology, host relationship and identification of ticks infesting dogs in Florida. N. Amer. Vet. 20(7):45-50.

Irons, J. V., R. B. Eads, C. W. Johnston, O. L. Walker & M. A. Norris
1952. Southwest Texas Q Fever studies. J. Parasit. 38(1):1-5.

Jellison, W. L. & J. D. Gregson
1947. Tick paralysis in Northwestern United States and British Columbia. Rocky Mtn med. J. 47:28-32.

Kohls, G. M.
1947. Vectors of rickettsial diseases. Ann. intern. Med. 26:713-719.

_____.
1947a. Notes on the tick *Ixodes howelli* Cooley and Kohls, with descriptions. J. Parasit. 33(1):57-61.

_____. & H. Hoogstraal
1960. Observation on the subgenus Argas (Ixodoidea,Argasidae,Argas). 2. *A. cooleyi*, new species, from western North American birds. Ann. ent. Soc. Amer. 53(5):625-631.

_____., _____. & C. M. Clifford
1961. 5. Study of *A. brevipes* Banks, 1908, from birds in Arizona and California, U.S.A., and Baja California, Mexico. Ann. ent. Soc. Amer. pp. 869-877.

Longanecker, D. S.
1951. Laboratory and field studies on the biology of the relapsing fever tick vector (*Ornithodoros hermsi* Wheeler) in the high mountains of California. Amer. J. trop. Med. 31(3):373-380.

MacCreary, D.
1945. Ticks of Delaware with special reference to *Dermacentor variabilis* (Say) vector of Rocky Mountain Spotted Fever. Bull. Del. agric. Exp. Sta. no. 252. 22 p.

Mazzotti, L. & M. T. Osorio
1943. Experimentos de transmisión de *Trypanosoma cruzi* en cuatro especies de *Ornithodoros*. Rev. Inst. Salubr. Enferm. trop., Méx. 4(2):163-165.

McIntosh, A.
1934. Distribution of *Boophilus annulatus australis* (Fuller) in the United States. Proc. helm. Soc. Wash. 1(1):22 p.

Miller, A. E.
1925. An introductory study of the Acarina, or mites, of Ohio. Bull. Ohio agric. Exp. Sta no. 386. 83-172 p.

Mills, H. B.
1942. Montana insect pests, 1941 and 1942. Twenty-ninth report of the state entomologist. Bull. Mont. agric. Exp. Sta no. 408. 36 p.

Parish, H. E. & C. S. Rude
1946. DDT to control the winter horse tick. J. econ. Ent. 39(1):92-93.

Parker, R. R.
1916. Some facts of importance concerning the Rocky Mountain Spotted Fever tick (*Dermacentor venustus*, Banks) in eastern Montana. Bienn. Rep. Mont. Bd Ent. 2:45-56.

_____.
1934. Recent studies of tick-borne diseases made at the United States Public Health Service at Hamilton, Montana. Proc. Pan-Pacif. sci. Congr 1933. pp. 3367-3374.

_____., C. B. Philip & W. L. Jellison
1933. Rocky Mountain Spotted Fever. Potentialities of tick transmission in relation to geographical occurrence in the United States. Amer. J. trop. Med. 13(4):341-379.

_____., _____., G. E. Davis & R. A. Cooley
1937. Ticks of the United States in relation to disease in man. J. econ. Ent. 30:51-69.

_____., J. F. Bell, W. S. Chalgren, F. B. Thrailkill & M. T. McKee
1952. The recovery of strains of Rocky Mountain spotted fever and tularemia from ticks of the eastern United States. J. infect. Dis. 91:231-237.

Philip, C. B.
1939. Tularemia in Alaska. Proc. 6th Pacif. Sci. Congr. 5:71-73.

_____.
1939a. Rocky Mountain Spotted Fever: known and potential tick vectors in the United States. Proc. 6th Pacif. Sci. Congr. 5:581-584.

Portman, R. W.
1944. Winter distribution of two ectoparasites of the cottontail rabbit in Missouri. J. econ. Ent. 37(4):541 p.

Price, M. A.
1958. A new species of tick from the Trans-Pecos region of Texas. J. Parasit. 44(6):649-651.

Ransmeier, J. C.
1949. Tick paralysis in the eastern United States. A summary, with report of four new cases from Georgia. J. Pediat. 34(3):299-308.

Rees, C. W.
1934. Transmission of Anaplasmosis by various species of ticks. Tech. Bull. U. S. Dep. Agric. no. 418. 17 p.

Sidwell, R. W., D. L. Lundgren, J. B Bushman & B. D. Thorpe
1964. The occurrence of a possible epizootic of Q fever in fauna of the Great Salt Lake Desert of Utah. Am. J. trop. Med. Hyg. 13(5):754-762.

Smadel, J. E.
1959. Status of the rickettsiosis in the United States. Ann. intern. Med. 51(3):421-435.

Smith, C. N. & H. K. Gouck
1947. *Ixodes bishoppi*, a new species from Georgia (Acarina:Ixodidae). Ann. ent. Soc. Amer. 40(1):75-81.

_____., M. M. Cole & H. K. Gouck
1946. Biology and control of the American dog tick. Tech. Bull. U. S. Dep. Agric. no. 905. 74 p.

Tate, H. D.
1941. The biology of the tropical cattle tick and other species of tick in Puerto Rico, with notes on the effects on ticks of arsenical dips. J. Agric. Univ. P. R. 25(1):1-24.

Yakimoff, W. L.
1922. Contribution à l'Etude des Ixodidés de Russie. Bull. Soc. Pat. exot. 15(1):41-46.

L. MITES

The entries for mites include a wide variety of species, most of which seldom bite man. For the most part, there are no biological entries. The Trombiculid entries are, of course, for larval stages. Most of the others will be for various stages, but mostly for adults.

There are 78 species or subspecies recorded in the tables.

TABLE 1 - MITES

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ACARUSCUS			
brasiliensis (Ewing)	---; 323°	Ewing	1943
bustamanensis (Da Fonseca)	---; 323°	Ewing	1943
flui (Van Thiel)	---; 323°	Ewing	1943
hominis (Ewing)	---; 323°	Ewing	1943
masoni Ewing	---; 323°	Ewing	1943
ALLODERMANYSSUS	In houses or in apartments "causing rash"; 323*°	Pratt et al.	1949
sanguineus (Hirst)	Naturally infected with *Rickettsia akari*, experimental transmission of rickettsia; 323	Baker et al.	1956
BDELLONYSSUS *bacoti* (Hirst)	Abundant in houses, bites readily, bite is painful burning or itching, abundant during winter; 323°	Strandtmann & Eben	1953
	Experimental vector and natural host of endemic typhus; 323 (Prefers darkness although it moves freely by day, active all year)	Browning	1950
	Experimentally infected with *Bacterium tularense*; 323	Hopla	1951
sylviarum (Canestrini & Fanzago)	Naturally infected with St. Louis encephalitis and western equine encephalitis; 323	Reeves et al.	1955
DERMANYSSUS			
americanus Ewing	Western equine encephalomyelitis recovered; 323	Baker et al.	1956
gallinae (De Geer)	Natural and experimentally infected with St. Louis encephalitis, naturally infected with eastern and western equine encephalomyelitis; 323 (Causes painful skin irritations)	Baker et al.	1956
	Experimental transmission of St. Louis encephalitis; 323	Reeves et al.	1955
	---; 323°	Miller	1925
DERMATOPHAGOIDES *scheremetewskyi* Bognow	Infest scalp and other parts of body, July and Aug.; 323*°	Traver	1951

TABLE 1 - MITES (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
EUTROMBICULA alfreddugesi (Oudemans)	Field, experimental transmission of scrub typhus; 323	Jenkins	1948
	---; 323°	Fuller	1952
batatas (Linnaeus)	---; 323	Fuller	1952
harperi Ewing	---; 323	Radford	1942
mosoni Ewing	Field, experimental transmission of scrub typhus; 323	Jenkins	1948
mycetis Ewing	---; 323	Radford	1942
tropica (Ewing)	---; 323	MacCreary	1945
GLYCYPHAGUS domesticus De Geer	---; 26°	Zakhvatkin	1941
LIPONYSSUS bacoti (Hirst)	In buildings and stores, active by night and hide in crevices and cracks, by day, bite is irritating, common in winter and spring; 62°	Spencer	1937
	In houses nightly, on warm walls near steam pipes; 323° (Vector of endemic typhus)	Mackie	1927
	Experimental vector of Coxsackie virus; 323	Schwab et al.	1952
	Experimental transmission of endemic typhus; 323	Dove & Shelmire	1931
	Experimental vector of Rickettsialpox; 323	Philip & Hughes	1948
bursa Berlese	In houses, spring; 62	Spencer	1930
ORNITHONYSSUS bacoti (Hirst)	Murine typhus have been recovered, natural and experimental transmission of murine typhus, experimental transmission of *Pasteurella pestis*, experimentally infected with coxsackie virus and tularemia; 323 (Produce irritation and sometimes painful dermatitis)	Baker et al.	1956
bursa (Berlese)	---; 323 (Cause discomfort)	Baker et al.	1956

TABLE 1 - MITES (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ORNITHONYSSUS *sylvianum* (Canestrini & Fanzago)	Western equine encephalomyelitis and St. Louis encephalitis have been recovered; 323 (Cause itching by its bite and crawling on the skin)	Baker et al.	1956
PEDICULOIDES *ventricosus* (Newport)	---; 323*°	Webster	1910
PYEMOTES *ventricosus* (Newport)	Cause eruptions, the lesions itch severely, as many as 200-300 bites have been reported, some fever, malaise, vomiting, backache, secondary infections and regional lymphadenopathy has occurred; 323°	Baker et al.	1956
SARCOPTES *canis* Gerlach	---; 323°	Miller	1925
equi Gerlach	---; 323°	Miller	1925
scabiei De Geer	---; 323°	Miller	1925
TROMBICULA *alaskensis* Brennan	---; 5	Wharton	1952
alfreddugesi (Oudemans)	---; 62, 323 (Pestiferous to men, bites cause severe inflammatory reaction)	Jenkins	1949
	April-November; 323	Wharton	1951
	---; 351°	Jenkins	1949 a
alfreddugesi *tropica* (Ewing)	---; 323°	Jenkins	1949 a
aplodontiae Brennan	---; 323	Brennan	1946
batatas (Linnaeus)	July-Oct.; 323	Baker et al.	1956
	---; 323°	Jenkins	1949 a
belkini Gould	---; 323°	Wharton	1952
bisignata Ewing	---; 323	Brennan & Wharton	1950

TABLE 1 - MITES (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
THROMBICULA			
blarinae Ewing	---; 323	Ewing	1931
browni Brennan	---; 323	Brennan & Wharton	1950
californica Ewing	Jan.; 62. Jan., April, July; 323	Ewing	1942
carterae Brennan	---; 323	Brennan & Wharton	1950
cavicola Ewing	---; 62, 323	Brennan & Wharton	1950
cinnabaris Ewing	---; 323	Ewing	1925
cynos Ewing	---; 323	Ewing	1937
dinehartae Brennan & Wharton	---; 323	Brennan & Wharton	1950
eptesici Brennan	---; 323	Brennan	1947
eusignata Brennan & Wharton	---; 323	Brennan & Wharton	1950
farrelli Brennan & Wharton	---; 323	Brennan & Wharton	1950
goodpasteri Brennan & Wharton	---; 323	Brennan & Wharton	1950
gurneyi Ewing	---; 323	Ewing	1937
harperi Ewing	---; 62	Knight	1951
	---; 323	Brennan & Wharton	1950
hylae Ewing	---; 323	Ewing	1925a
irritans (Riley)	---; 323°	Ewing	1931
	Fecal matter and decaying woody substances; 351°	Strong et al.	1926

TABLE 1 - MITES (continued)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TROMBICULA *jamesoni* Brennan	---; 62	Jameson	1950
	---; 323	Wharton	1952
jewetti Brennan & Wharton	---; 323	Brennan & Wharton	1950
jonesae Brennan	---; 323	Brennan	1952
la dentata Ewing	---; 323	Ewing	1925
lipovskyana Wolfenbarger	Bites in the woods; 323°	Baker et al.	1956
	---; 323	Wolfenbarger	1952
lipovskyi Brennan & Wharton	---; 323	Brennan & Wharton	1950
microti Ewing	---; 62, 323	Brennan & Wharton	1950
montanensis Brennan	---; 62	Brown & Brennan	1952
	---; 323	Brennan	1946
multisetosa (Ewing)	---; 323°	Jenkins	1949
myotis Ewing	---; 62	Brown & Brennan	1952
	Possible vector of tsutsugamushi; 323	Wharton	1947
oregonensis Ewing	---; 323	Ewing	1931
parkeri Radford	---; 323	Radford	1942
richmondi Brennan & Wharton	---; 323	Brennan & Wharton	1950
rohweri Ewing	Feb.; 323	Ewing	1942
russicum myotis Ewing	---, 323	Fuller	1952

TABLE 1 - MITES (conclusion)

SPECIES	SPECIFIC NOTES; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
TROMBICULA			
scottae Brennan	---; 323	Brennan	1952
sergenti Brennan	---; 323	Brennan	1952
setosa Ewing	---; 323	Ewing	1937
splendens Ewing	---; 62. Abundant in swamps, bogs and moist places near coastal areas; 323*°. ---; 351°	Jenkins	1949a
subsignata Brennan & Wharton	---; 323	Brennan & Wharton	1950
sylvilagi Brennan & Wharton	---; 323	Brennan & Wharton	1950
tlalzahuatl Murray	---; 323°, 351	Miller	1925
trisetica Loomis	---; 323	Loomis & Crossley	1953
varians Brennan & Wharton	---; 323	Brennan & Wharton	1950
waynensis Brennan & Wharton	---; 323	Brennan & Wharton	1950
whartoni Ewing	---; 323	Ewing	1931
TYROGLYPHUS longior Gervais	In human stool, possibly the cause of intestinal disorder; 323	Hinman & Kampmeier	1934

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY MITES

SPECIES	DISEASE ORGANISM: VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	DISTRIBUTION
ALLODERMANYSSUS sanguineus (Hirst)	Rickettsialpox				323
DERMATOPHAGOIDES scheremetewskyi Bognow				Scalp dermatitis	323
PEDICULOIDES ventricosus (Newport)				Dermatitis	323
TROMBICULA splendens Ewing				Trombidiosis	323

LITERATURE CITED

Baker, E. W., T. M. Evans, D. J. Gould, W. B. Hull & H. L. Keegan
1956. A manual of parasitic mites of medical or economic importance. Nat. Pest Control Ass., Inc., New York, N. Y. 170 p.

Brennan, J. M.
1946. Two new species of *Trombicula*: *T. montanensis* and *T. aplodontiae* (Acarina, Trombiculidae) from the northwestern United States. J. Parasit. 32(5):441-444.

_____.
1947. New species of chiggers (Acarina,Trombiculidae) from bats of the Nearctic region. J. Parasit. 33(3):245-252.

_____.
1952. *Trombicula cynos* Ewing, 1937, and three related new species. (Acarina. Trombiculidae). Wasmann J. Biol. 10:55-65.

_____. & G. W. Wharton
1950. Studies on North American chiggers. 3. The subgenus Neotrombicula. Amer. Midl. Nat. 44:153-197.

Brown, J. H. & J. M. Brennan
1952. A note on the chiggers (Trombiculidae) of Alberta. Can. J. Zool. 30:338-343.

Browning, E.
1950. On the occurrence of the tropical rat mite, *Bdellonyssus bacoti* (Hirst, 1913) -- synonym *Liponyssus bacoti* (Hirst) — in Great Britain. Ann. trop. Med. Parasit. 44:124-131.

Dove, W. E. & B. Shelmire
1931. Tropical rat mites, *Liponyssus bacoti* Hirst, vectors of endemic typhus. J. Amer. med. Ass. 97:1506-1510.

Ewing, H. E.
1925. A contribution to our knowledge of the taxonomy of chiggers, including the description of a new genus, six new species and a new variety. Amer. J. trop. Med. 5(3):251-265.

_____.
1925a. Two new chiggers (Trombicula larvae). Proc. ent. Soc. Wash. 27(7):146 p.

_____.
1931. A catalogue of the Trombiculinae, or chigger mites of the New World with new genera and species and a key to the genera. Proc. U. S. nat. Mus. 80(8):14 p.

_____.
1937. New species of mites of the subfamily Trombiculinae, with a key to the New World larvae of the akamushi group of the genus *Trombicula*. Proc. biol. Soc. Wash. 50:171-172.

_____.
1942. Remarks on the taxonomy of some American chiggers (Trombiculinae), including the descriptions of new genera and species. J. Parasit. 28(6):485-492.

Ewing, H. E
1943. The American chigger (larvae of the Trombiculinae) of the genus *Acariscus*, new genus. Proc. ent. Soc. Wash. 45(3):60-61.

Fuller, H. S.
1952. The mite larvae of the family Trombiculidae in the Oudemans Collection: taxonomy and medical importance. Zool. Verh., Leiden. 261 p.

Hinman, E. H. & R. H. Kampmeier
1934. Intestinal Acariasis due to *Tyroglyphus longior* Gervais. Amer. J. trop. Med. 14(4):355-362.

Hopla, C. E.
1951. Experimental transmission of tularemia by the tropical rat mite. Amer. J. trop. Med. 31(6):768-783.

Jameson, E. W. Jr.
1950. The external parasites of the short-tailed shrew, *Blarina brevicauda* (Say). J. Mammal. 31:138-145.

Jenkins, D. W.
1948. Trombiculid mites effecting man. II. Control of larval behavior for disease transmission studies. Amer. J. Hyg. 48(1):36-44.

_____.
1949. Trombiculid mites affecting man. IV. Revision of *Eutrombicula* in the American hemisphere. Ann. ent. Soc. Amer. 42:289-318.

_____.
1949a. Trombiculid mites affecting man. III. *Trombicula (Eutrombicula) splendens* Ewing in North America. J. Parasit. 35(2):201-203.

Knight, I. W. M.
1951. A report on mites infesting the muskrat (*Ondatra zibethica osoyoosensis*) in British Columbia. Canad. Ent. 83 279-280.

Loomis, R. B. & D. A. Crossley, Jr.
1953. A new species of chigger from eastern Kansas (Acarina,Trombiculidae). J. Kans. ent. Soc. 26(1):32-34.

MacCreary, D.
1945. Some ectoparasites, excluding Ixodoidea, of Delaware mammals. J. econ. Ent. 38(1):126-127.

Mackie, D. B.
1937. Entomological service. Bull. Calif. Dep. Agric. 25(4):455-481.

Miller, A. E.
1925. An introductory study of the Acarina, or mites, of Ohio. Bull. Ohio agric. Exp. Sta. no. 386 85-172 p.

Philip, C. B. & L. E. Hughes
1948. The tropical rat mite, *Liponyssus bacoti*, as an experimental vector of rickettsialpox. Amer. J. trop. Med. 28(5):697-705.

Pratt, H. D., J. E. Lane & F. C. Harmston
1949. New locality records for *Allodermanyssus sanguineus* vector of rickettsialpox. J. econ. Ent. 42:414-415.

Radford, C. D.
1942. The larval Trombiculinae (Acarina,Trombidiidae) with descriptions of twelve new species. Parasitology. 34:72 p.

Reeves, W. C., W. McD. Hammon, W. H. Doetschman, H. E. McClure & G. Sather
1955. Studies on mites as vectors of western equine and St. Louis encephalitis viruses in California. Amer. J. trop. Med. Hyg. 4(1):90-105.

Schwab, M., R. Allen & S. E. Sulkin
1952. The tropical rat mite (*Liponyssus bacoti*) as an experimental vector of Coxsackie virus. Amer. J. trop. Med. Hyg. 1(6):982-986.

Spencer, G. J.
1930. Insect pests (or insect allies) that have recently a[illegible] ouver District, British Columbia, 1928-1929. 60th Rep. ent. Soc. Ont. [illegible] 54.

_____.
1937. The menace of rat parasites in Vancouver in 1936. Proc. ent. Soc. B C. no. 33. 44-45 p.

Strandtmann, R. W. & D. J. Eben
1953. A survey of typhus in rats and rat ectoparasites in Galveston Texas. Tex. Rep. Biol. Med. 11(1):144-151.

Strong, R. P., G. C. Shattuck, J. C. Bequaert & R. E. Wheeler
1926. Medical report of the Hamilton Rice Seventh Expedition to the Amazon, in conjunction with the Department of Tropical Medicine of Harvard University, 1924-1925. Contr. Harv. Inst. trop. Biol. Med. 313 p.

Traver, J. R.
1951. Unusual scalp dermatitis in humans caused by the mite, (Acarina,Epidermoptidae). Proc. ent. Soc. Wash. 53:1-25.

Webster, F. M.
1910. A predaceous and supposedly beneficial mite, *Pediculoides*, becomes noxious to man. Ann. ent. Soc. Amer. 3:15-39.

Wharton, G. W.
1947. Studies on North American chiggers. 1. The "*akamushi*" group. J. Parasit. 33(3):260-264.

_____.
1951. Distribution and periodical activity of chiggers near Duke University. (Abs.). J. Parasit. 37(5):29 p.

_____.
1952. A manual of the chiggers. The biology, classification, distribution, and importance to man of the larvae of the family Trombiculidae. (Acarina). Mem. ent Soc. Wash. no. 4. 185 p.

Wolfenbarger, K. A.
1952. Systematic and biological studies on North American chiggers of the genus *Trombicula*, subgenus *Eutrombicula* (Acarina, Trombiculidae). Ann. ent. Soc. Amer. 45(4):645-677.

Zakhvatkin, A. A.
1941. Fauna of U.S.S.R.-Arachnoidea Tyroglyphoidea (*Acari*). Zool. Inst. Acad. Sci. USSR. 6(1):57[illegible] p.

M. MISCELLANEOUS ARTHROPODS

The entries listed as Miscellaneous Arthropods are lice, beetles, scorpions and spiders. There are only 17 species or subspecies listed.

TABLE 1 - MISCELLANEOUS ARTHROPODS

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
ATTAGENUS *piceus* (Olivier)	---; ---; 323*	Scott	1962
AUTOSERICA *castanea* Arrow	---; invasion of human ear; 323°	Maddock & Fehn	1958
CENTRUROIDES *suffusus* Peacock	---; ---; 323 (Stings man, poison may cause death)	Baerg	1929
vittatus Say	---; sting causes severe pain; 323°	Baerg	1929
CYCLOCEPHALA *borealis* Arrow	---; invasion of human ear; 323°	Maddock & Fehn	1958
EURYPELMA *californica* Ausserer	---; ---; 323°	Baerg	1929
LATRODECTUS *mactans* Fabricius	---; ---; 62°	Strickland	1936
	---; sting may cause death; 323°	Herms	1926
	---; ---; 323 (Bites man, producing muscular pain and mild paralysis)	Baerg	1929
NEOHAEMATOPINUS *citellinus* Ferris	---; naturally infected with *Coxiella burnetii*; 323	Sidwell et al.	1964
laeviusculus Grube	---; experimental transmission of *Pasteurella tularense*; 323	Parker	1934
OCHROSIDIA *villosa* Burmeister	---; invasion of human ear; 323°	Maddock & Fehn	1958
PEDICULUS *humanus* De Geer	---; ---; 323°	Hatch	1938
humanus *corporis* De Geer	---; ---; 323°	Hatch	1938
PHTHIRUS *pubis* Linnaeus	---, ---; 323°	Hatch	1938
POLYPLAX *spinulosa* Burmeister	---; experimental typhus vector; 323	Cole & Koepke	1946

TABLE 1 - MISCELLANEOUS ARTHROPODS (conclusion)

SPECIES	BREEDING HABITATS; ADULT ACTIVITY; DISTRIBUTION (GENERAL STATEMENTS)	AUTHOR	DATE
SCOLOPENDRA polymorpha Wood	---; ---; 323 (Bite painful)	Baerg	1929
TENEBRIO molitor Linnaeus	---; ---; 323*	Palmer	1946
TROGODERMA versicolor (Creutzer)	---; ---; 323*	Scott	1962

TABLE 2 - SUMMARY OF DISEASES OR DISEASE ORGANISMS TRANSMITTED BY MISCELLANEOUS ARTHROPODS

SPECIES	DISEASE ORGANISM				DISTRIBUTION
	VIRUS & RICKETTSIA	PROTOZOA	HELMINTHS	OTHER	
ATTAGENUS piceus (Olivier)				Cantharias is	323
TENEBRIO molitor Linnaeus				Cantharias is	323
TROGODERMA versicolor (Creutzer)				Cantharias is	323

LITERATURE CITED

Baerg, W. J.
1929. Some poisonous arthropods of North and Central America. 4th Int. Congr. Ent. 2:418-438.

Cole, L. C. & J. A. Koepke
1946. A study of rodent ectoparasites in Mobile, Alabama. Publ. Hlth Rep., Wash. 61(41):1469-1487.

Eater, M. E.
1938. A bibliographical catalogue of the injurious Arachnids and insects of Washington. Univ. Wash. Publ. Biol. 1(4):163-223.

Herms, W. B.
1926. *Hippelates* flies and certain other pests of the Coachella Valley, California. J. econ. Ent. 19(5):692-695.

Maddock, D. R. & C. F. Fehn
1958. Human ear invasions by adult Scarabaeid beetles. J. econ. Ent. 51(4):546-547.

Palmer, E. D.
1946. Intestinal cantharidiasis due to *Tenebrio molitor*. J. Parasit. 32(1):54-55.

Parker, R. R.
1934. Recent studies of tick-borne diseases made at the United States Public Health Service at Hamilton, Montana. Proc. Pan-Pacif. Sci. Congr 1933. pp. 3367-3374.

Scott, E. G.
1962. Blister beetle dermatitis produced by *Epicauta cinerea* (Coleoptera:Meloidae). J. econ. Ent. 55(1):145-146.

Stowell, R. W., D. L. Lundgren, J. B. Bushman & B. D. Thorpe
1964 The occurrence of a possible epizootic of Q fever in fauna of the Great Salt Lake Desert of Utah. Am. J. trop. Med. Hyg. 13(5):754-762.

Strickland, E. E.
1936. The distribution of the black widow spider in Alberta. Canad. Ent. 68(12):284-285.

Unclassified
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)* Cornell University Ithaca, New York 14850	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP

3. REPORT TITLE

ARTHROPODS OF MEDICAL IMPORTANCE IN AMERICA NORTH OF MEXICO

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

5. AUTHOR(S) *(First name, middle initial, last name)*

Travis, B. V., H. H. Lee, and R. M. Labadan

6. REPORT DATE January 1969	7a. TOTAL NO. OF PAGES 347 and map	7b. NO. OF REFS 534
8a. CONTRACT OR GRANT NO DA19-129-AMC-664(N) b. PROJECT NO. 1T025112A129 c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) 9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)* 69-2-ES (ES-47)	

10. DISTRIBUTION STATEMENT

Distribution of this document is unlimited.
Release to CFSTI is authorized.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY U.S. Army Natick Laboratories Natick, Massachusetts 01760

13. ABSTRACT

The occurrence of insects and other arthropods of medical importance in America North of Mexico is summarized on the basis of review of most of the available references in the scientific literature. The report includes, for each major group of arthropods, a listing of species and subspecies with biological and distributional data, tabulations of diseases or disease organisms transmitted, and literature citations.

The groups of arthropods included, with the number of species or subspecies in parentheses, are: Mosquitoes (361), Black flies (234), Sand flies (13), Midges (122), Horse flies (554), Biting flies (4), Non-biting flies (45), Fleas (543), Bugs (30), Urticating and vesicating arthropods (9), Ticks (110), Mites (78), and Miscellaneous arthropods (17).

DD FORM 1 NOV 65 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

Unclassified
Security Classification

Unclassified
Security Classification

14 KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Distribution	8		8			
Behavior	8					
Arthropods	9		6			
Mosquitoes	9		6			
Flies	9		6			
Fleas	9		6			
Midges	9		6			
Mites	9		6			
Ticks	9		6			
North America	9		9			
Military medicine	4					
Diseases	. .		7,9			
Disease vectors			9			

Unclassified
Security Classification