THE MOSQUITOES OF THE UNITED STATES.

By Harrison G. Dyar,
Custodian of Lepidoptera, United States National Museum.

INTRODUCTION.

Mosquitoes are small two-winged flies belonging to the order of Diptera, family Culicidae, subfamily Culicinae. The species are distributed all over the world, from the Arctic regions to the Tropics, but different species and genera are concerned in different faunal regions. The United States as here considered embraces the region between the Canadian and Mexican boundaries, including southern Florida and Alaska. This territory includes three main faunal regions. The first and most northern (except Alaska) is the Canadian zone. The mosquitoes of this region were treated in a separate paper by the writer.[1] This paper includes all mosquitoes reported from Canada, and not only those belonging to the Canadian zone proper. However, this paper will be more useful for the parts of the United States where the Canadian species are dominant than the present one, and the reader is accordingly recommended to it. The parts of the United States referred to are, roughly, northern Maine, the mountains of New England and New York, northern Minnesota, the mountains of Montana, and the higher parts of the Rocky Mountain chain to Colorado and the Yukon Valley in Alaska, above the southward bend of the river. The mountains bordering the Pacific coast, the Cascades and Sierra Nevada, have the Canadian fauna considerably modified, and are not covered by the paper referred to. They will be found included here.

The second faunal region comprises the coastal area on the Pacific between the mountains and the sea, beginning in Washington State and extending up the coast at least to Cape Fanshaw, Alaska. Above the area where the coast is bordered by islands, two more regions are indicated, but the country is insufficiently explored to permit of positive conclusions.

[1] Dyar, H. G., The Mosquitoes of Canada, Transactions of the Royal Canadian Institute, vol. 13, pp. 71–120, 1921.

The third faunal complex is of southern origin and extends upward from Mexico through the Mississippi Valley. The species are in general adapted to arid conditions, and present a contrast to the species of the Canadian fauna, which are adapted to conditions in which melted snow forms a prominent factor. This contrast is best shown in those species which depend upon temporary water. Species addicted to permanent water are naturally more independent of conditions of moisture or aridity, and their distribution depends more upon temperature. Thus in America the tropical area from about latitude 35° south to 35° north is inhabited by *Culex quinquefasciatus*. North and south of 35°, respectively, *Culex pipiens* occurs, and the two are coexistent for only a small distance. These are species dependent upon permanent water, and their distribution is governed by temperature conditions. On the other hand, *Aëdes punctor* is dominant in the Canadian zone, and gives rise to derivative forms in the coastal region and California mountains, but it is not found at all outside of the forested area, the *Aëdes* of the south belonging to wholly different groups. These are species depending upon temporary water, in the one case snow water, in the other case casual rains, and the adaptations are wholly different. Distribution here depends upon moisture, not temperature.

The principal diseases conveyed by mosquitoes in the United States are malaria and yellow fever. The danger of the former is everywhere present, the disease being conveyed by at least three species of *Anopheles*, with somewhat different capacities of carriage. The latter is only dangerous in times of epidemic, happily becoming scarce. The mere presence of the carrying species, *Aëdes aegypti*, is therefore not necessarily a subject for alarm.

The nomenclature adopted is that indicated in our standard American work.[2] Certain differences maintained by European writers will be mentioned.

Theobaldia instead of *Culiseta* as here used. There exists an earlier *Theobaldius*, which is held by the European writers not to invalidate *Theobaldia*. It is pointed out that there is no rule to this effect. It seems to us, however, that this similarity is confusing, and it is desirable to have names as assistance to study rather than the reverse. The difference consists in a gender termination, which in the case of species is never considered a sufficient difference.

Taeniorhynchus instead of *Mansonia* as here used. Lynch Arribálzaga founded *Taeniorhynchus* on a species which he considered to be *taeniorhynchus* Wiedemann, but which has been shown to have been *titillans* Walker, the former an *Aëdes*, the latter a *Mansonia*.

[2] Howard, Dyar, and Knab, The Mosquitoes of North and Central America and the West Indies, 1912–1917.

We took the type to be the species mentioned by Lynch; but European writers consider the type to have been the species actually before the author at the time. *Taeniorhynchus* is thus considered a synonym (or subgenus) of *Aëdes* by us; for the European writers the name replaces *Mansonia.*

Heteronycha as a synonym (or subgenus) of *Aëdes* or of *Culex.* Lynch Arribálzaga described *Heteronycha dolosa* in such a way that it appears that he had a male *Culex* and a female *Aëdes* before him, wrongly associated as one species. In the monograph, we restrict *Heteronycha* to the *Aëdes* element, discussing the matter at length. It has since been pointed out to me that *Heteronycha* was previously restricted to the *Culex* element, and by the principle of the first reviser we were not at liberty to take the action mentioned. However, the so-called previous revision consists only in the reference to the synonymy of *Heteronycha dolosa* to *Culex fatigans* by Theobald.[3] There is not a word of explanation or of comment, and Lynch's contrary diagnosis of the female is ignored. Moreover, the male before Lynch was not *Culex fatigans*, but a different species, since described as *Culex bonariensis* Brèthes. Therefore Theobald's reference is wholly in error, the female which he calls *fatigans* being not a *Culex*, but an *Aëdes* (*Aëdes lynchii* Brèthes), while the male he calls *fatigans* is another species (*bonariensis*). Can a mere indication of an erroneous synonymy be characterized properly as the work of the first reviser? If so *Heteronycha* should be a synonym of *Culex.* Otherwise the use of the name as a subgenus of *Aëdes* as here done is indicated.

Culex fatigans instead of *Culex quinquefasciatus.* The name *quinquefasciatus* is older than *fatigans*, but the identity of the former is called in question. No certain types exist. Say's description is brief, but is said by European writers to suggest an *Anopheles*, because, he says, "body clothed with cinereous hair." I do not think that at that time a fine distinction would be drawn between hairs of *Anopheles* and the narrow curved scales of *Culex.* The fact that Say says the legs are short and the abdomen banded would seem to exclude *Anopheles* and fix the present species, and also the deciduous mesonotal vestiture, which does not exist in *Anopheles.*

In this paper the trinomial subspecific nomenclature has not been adopted. All subspecies are here classified as species; but where forms have been considered as subspecies the fact is mentioned in each case.

The terminology of the parts of the male genitalia proposed by Edwards[4] has been adopted in this paper, superseding the one used

[3] Mon. Culic., vol. 2, p. 151, 1901.
[4] Ann. Trop. Med. & Par., vol. 14, pp. 23–40, 1920.

in the monograph and the modification of it in the paper on Canadian mosquitoes.

KEY TO THE TRIBES AND GENERA OF THE MOSQUITOES OF THE UNITED STATES.

Metanotum with a tuft of setae.....Tribe **Sabethini.**
Genus **Wyeomyia** Theobald.

Metanotum nude.....Tribe **Culicini.**

1. Wings with the second marginal cell less than half as long as its petiole ..... 2.
   Wings with the second marginal cell over half as long as its petiole..... 3.
2. Proboscis rigid, down curved.....Genus **Megarhinus** Robineau-Desvoidy.
   Proboscis flexible, normal.....Genus **Uranotaenia** Lynch Arribalzaga.
3. Scutellum rounded, not lobed.....Genus **Anopheles** Meigen.
   Scutellum distinctly trilobed ..... 4.
4. Cross veins tending to lie in line, the posterior close to the anterior, or mesonotum with bare impressed discolorous lines, or both.
   Genus **Culiseta** Felt.
   Cross veins normal; mesonatol integument without impressed discolorous lines ..... 5.
5. Fourth joint of fore tarsus very short.....Genus **Orthopodomyia** Theobald.
   Fourth joint of fore tarsus longer, normal ..... 6.
6. Second joint of antennae very long in both sexes, those of the male similar to the female.....Genus **Deinocerites** Theobald.
   Second joint of antennae short; antennae of male dissimilar to those of the female ..... 7.
7. Abdomen of female blunt, with short cerci; hypopygium of male with the side pieces curved down, or shortly projecting ..... 8.
   Abdomen of the female pointed, cerci exerted; hypopygium of male with the side pieces prominently projecting, straight ..... 9.
8. Wing scales narrow, normal.....Genus **Culex** Linnaeus.
   Wing scales distinctly large and broad.....Genus **Mansonia** Blanchard.
9. Abdomen of female with the eighth segment wholly retractile, nude; male claspette with multiple terminal appendages.
   Genus **Psorophora** Robineau-Desvoidy.
   Abdomen of female with the eighth segment only partly retractile; male claspette with only a single appendage, or claspette wanting.
   Genus **Aedes** Meigen.

Tribe SABETHINI.

The mosquitoes of this tribe are almost wholly tropical. Their larvae live in the water that collects in plants, either living or dead, such as the leaf bases of Bromeliaceae, flower bracts of Heliconia, cavities in tree trunks, cocoanut shells, cacoa shells, and palm spathes. In some instances this water is rendered thick and gummy by the exudations of the plants, and in others it is foul and opaque. Two species occur in the United States in Bromeliaceae, and a third in the pitcher plant, with a northern distribution.

Genus WYEOMYIA Theobald.

Wyeomyia Theobald, Journ. Trop. Med., vol. 4, p. 233, 1901.
Phoniomyia Theobald, Mon. Culic., vol. 3, p. 311, 1903.

Dendromyia THEOBALD, Mon. Culic., vol. 3, p. 313, 1903.
Miamyia DYAR, Ins. Ins. Mens., vol. 7, p. 116, 1919.
Dinomyia DYAR, Ins. Ins. Mens., vol. 7, p. 117, 1919.
Triamyia DYAR, Ins. Ins. Mens., vol. 7, p. 120, 1919.
Pentemyia DYAR, Ins. Ins. Mens., vol. 7, p. 122, 1919.
Heliconiamyia DYAR, Ins. Ins. Mens., vol. 7, p. 123, 1919.
Diphalangarpe DYAR, Ins. Ins. Mens., vol. 7, p. 126, 1919.
Cleobonnea DYAR, Ins. Ins. Mens., vol. 7, p. 135, 1919.
Decamyia DYAR, Ins. Ins. Mens., vol. 7, p. 135, 1919.
Calladimyia DYAR, Ins. Ins. Mens., vol. 7, p. 137, 1919.
Dodecamyia DYAR, Ins. Ins. Mens., vol. 7, p. 136, 1919.
Lemmamyia DYAR, Ins. Ins. Mens., vol. 7, p. 140, 1919.
Hystatomyia DYAR, Ins. Ins. Mens., vol. 7, p. 140, 1919.
Dyarina BONNE-WEPSER and BONNE, Ins. Ins. Mens., vol. 9, p. 6, 1921.

A large genus of tropical distribution, most of the species addicted to the water in the leaves of Bromeliaceae. The genus has been subdivided into subgenera on the characters of the male genitalia. Those occurring in the United States separate as follows:

1. Stem of clasper short, irregular----------Subgenus **Dendromyia** Theobald.
   Stem of clasper long and slender----------Subgenus **Wyeomyia** Theobald.

KEY TO THE UNITED STATES SPECIES OF WYEOMYIA.

1. Prothoracic lobes silvery----------**vanduzeei** Dyar and Knab.
   Prothoracic lobes violet blue----------2
2. Mid and hind tarsi marked with white in the female----**mitchellii** Theobald.
   Mid tarsi only marked with white in the female----------**smithii** Coquillett.

Subgenus WYEOMYIA Theobald.

WYEOMYIA (WYEOMYIA) MITCHELLII Theobald.

Dendromyia mitchellii THEOBALD, Mosq. or Culic. of Jam., p. 37, 1905.
Wyeomyia ochrura DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 227, 1906.
Wyeomyia antoinetta DYAR and KNAB, Smith. Misc. Colls., quart. iss., vol. 52, p. 263, 1909.

A small stout mosquito with dark mesonotum and violet prothoracic lobes, the mid legs with the distal half of second tarsal joint, the third to fifth silvery white, the hind legs with small white spots at the bases of the tarsal joints beneath, the latter occasionally absent (*antoinetta* Dyar and Knab). Abdomen black above, silvery white below, the colors separated on the sides in a straight line. Patches of silvery white scales on the sides. A small group of bristles on the posterior side of the metanotum.

The larvae live in the water that collects in the leaf bases of epiphytic Bromeliaceae, which adorn the limbs of the higher trees in tropical Florida. The life history has not been minutely observed.

Distribution.—The Greater Antilles and southern Florida.

United States Records.

FLORIDA: Estero, May 10, 1906 (J. B. Van Duzee).
Royal Palm Park, April 30, 1918 (C. A. Mosier).
Cocoanut Grove, March 24, 1917 (T. E. Snyder).
Miami Beach, April 9, 1917 (T. E. Snyder).
Homestead, March 12, 1917 (C. A. Mosier).

Subgenus DENDROMYIA Theobald.

WYEOMYIA (DENDROMYIA) VANDUZEEI Dyar and Knab.

Wyeomyia vanduzeei DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 138, 1906.

Wyeomyia bahama DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 138, 1906.

Wyeomyia argyrura DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 24, p. 70, 1908.

Wyeomyia conchita DYAR and KNAB, Smith. Misc. Colls., quart. iss., vol. 52, p. 264, 1909.

A small stout mosquito with dark mesonotum, the prothoracic lobes silvered. Legs dark, the mid tarsi marked with silvery white at tip of second joint and all of third to fifth. Abdomen black above, silvery at extreme tip and beneath, the colors separated on the sides in a straight line. Patches of silvery white scales on the sides. A small group of minute bristles on the posterior side of the metanotum.

The larvae live in the water that collects in the bases of the leaves of epiphytic Bromeliaceae. They occur all the year around, provided that water remains in the leaves.

The adult will bite, although not with ferocity. The writer was bitten by one while stooping over a pool for some time.

Distribution.—Cuba, the Bahamas, and southern Florida.

United States Records.

FLORIDA: Estero, April and May, 1906 (J. B. Van Duzee).
Osprey, July 19 and August 31, 1901 (J. G. Webb).
Biscayne Bay, ——— (A. T. Slosson).
Paradise Key, March 27, 1917 (T. E. Snyder).

WYEOMYIA (DENDROMYIA) SMITHII Coquillett.

Aëdes smithii COQUILLETT, Can. Ent., vol. 33, p. 260, 1901.

A small stout mosquito with dark mesonotum and legs, mid tarsi marked with white from apex of second joint to fifth. Abdomen black above, silvery white below, the colors separated on the sides in a straight line. Prothoracic lobes submetallic blue. Patches of silvery white scales on the sides. A small group of minute bristles on the posterior side of the metanotum.

The larvae live in the water in the leaves of pitcher plants (*Sarracenia purpurea*), passing the winter frozen up in the ice cores. The

eggs are laid on the still, dry, newly opened leaves, and hatch when water collects in them.

The mosquito is rarely met with except by breeding from pitcher-plant leaves. It has not been recorded as biting; but as many of the tropical species attack warm-blooded animals, this may be found to do so.

Distribution.—Canada to Alabama, probably coextensive with the range of the host plant, *Sarracenia purpurea.*

United States Records.

NEW HAMPSHIRE: Dublin, August, 1909 (H. G. Dyar).
MASSACHUSETTS: Westfield, July and August, 1909 (F. Knab).
Springfield, ——— (G. Dimmock).
NEW YORK: Tupper Lake, August, 1905 (H. G. Dyar).
NEW JERSEY: Lahaway, April 24, 1901 (J. T. Brakeley).
MARYLAND: Baltimore, November, 1901 (Dr. Coker).
DISTRICT OF COLUMBIA: Washington, ——— (E. G. Mitchell).
NORTH CAROLINA: Boardman, April, 1904 (A. D. Hopkins).
SOUTH CAROLINA: Swansea, August 11, 1911 (F. Knab).
ALABAMA: Theodore, April, 1910 (F. M. Jones).
ILLINOIS: Cedar Lake, June, 1892 (S. A. Forbes).
WISCONSIN: Crab Lake, November, 1907 (H. S. Barber).

Tribe CULICINI.

This tribe includes the bulk of the mosquitoes, and all of those of typically northern distribution. Only the lowest members, such as *Orthopodomyia*, *Megarhinus*, and the lower subgenera of *Aëdes*, live in water in plant tissues, such as the tree holes; most of the species inhabit ground puddles. The species and genera are variously differentiated. *Aëdes* inhabits temporary puddles, especially water left from the melting snow in spring, and these species have in general but a single annual generation. *Culex* and *Culiseta* inhabit pools of a generally permanent character, and overwinter as adults. *Anopheles* larvae are surface feeders, and consequently the character of the water makes less difference to them. They have been found in all sorts of water, even in running streams, but the different species are variously restricted.

Genus DEINOCERITES Theobald.

Deinocerites THEOBALD, Journ. Trop. Med., vol. 4, p. 235, 1901.
Brachiosoma THEOBALD, Journ. Trop. Med., vol. 4, p. 235, 1901.
Brachiosoma THEOBALD, Mon. Culic., vol. 2, p. 215, 1901.
Dinomimetes KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 120, 1907.
Dinanamesus DYAR and KNAB, Smith Misc. Colls., quart. iss., vol. 52, p. 259, 1909.

A genus of tropical distribution, all of the species of which live in the water in the holes of certain species of crabs which inhabit

marshes along the shore. Three genera were formed on the modifications of the antennae and the presence or absence of setae on the metanotum; but it seems best to consider these subdivisions as of only subgeneric rank. A single species occurs in southern Florida, which belongs to *Deinocerites* proper.

The water remains permanently in the holes of the crab, and the adult mosquitoes rest in the upper dry part of the hole. It has been surmised that the peculiar long antennae of the mosquito is an adaptation to present a large sensory surface so that the individuals can detect the approach of the crab in time to fly out of the hole before being overwhelmed in the water by the inrush of the crustacean.

DEINOCERITES (DEINOCERITES) CANCER Theobald.

Deinocerites cancer THEOBALD, Mon. Culic., vol. 2, p. 215, 1901.
Brachiomyia magna THEOBALD, Mon. Culic., vol. 2, p. 344, 1901.

A rather large blackish mosquito, entirely dark, venter dull brown. Abdomen blunt, but the cerci stout and prominent in the female, the male claspers large. Mesonotum coarsely hairy. Pleurae dark brown, the incisions testaceous.

The larvae inhabit crab holes near the sea, generally filled with brackish water. No exact observations on the life history are of record. The species is not known to bite.

Distribution.—Littoral of the Greater Antilles and southern Florida.

United States Records.

FLORIDA: Miami, May 23, 1905 (Dyar and Caudell).
Miami, October 3, 1921 (G. F. Moznette).

Genus CULEX Linnaeus.

Culex LINNAEUS, Syst. Nat., ed. 10, p. 602, 1758.
Lutzia THEOBALD, Mon. Culic., vol. 3, p. 155, 1903.
Melanoconops THEOBALD, Mon. Culic., vol. 3, p. 178, 1903.
Lasioconops THEOBALD, Mon. Culic., vol. 3, p. 235, 1903.
Melanoconion THEOBALD, Mon. Culic., vol. 3, p. 238, 1903.
Heptaphlebomyia THEOBALD, Mon. Culic., vol. 3, p. 336, 1903.
Aëdinus LUTZ, in Bourroul, Mosq. do Brasil, p. 54, 1904.
Neoculex DYAR, Proc. Ent. Soc. Wash., vol. 7, p. 45, 1905.
Tinolestes COQUILLETT, Proc. Ent. Soc. Wash., vol. 7, p. 185, 1905.
Micraëdes COQUILLETT, Proc. Ent. Soc. Wash., vol. 7, p. 185, 1905.
Gnophodeomyia THEOBALD, Journ. Econ. Biol., vol 1., p. 21, 1905.
Trichopronomyia THEOBALD, Ann. Nat. Mus. Hung., vol. 3, p. 98, 1905.
Carrollia LUTZ, Imp. Med., p. 81, 1905.
Pseudoheptaphlebomyia VENTRILLON, Bull. Mus. Nat. Hist., Paris, p. 427, 1905.
Isostomyia COQUILLETT, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, p. 16, 1906.
Mochlostyrax DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 233, 1906.

Jamesia CHRISTOPHERS, Sci. Mem. Med. Ind., new ser., No. 25, p. 12, 1906.
Culiciomyia THEOBALD, Mon. Culic., vol. 4, p. 227, 1907.
Aporoculex THEOBALD, Mon. Culic., vol. 4, p. 150, 1907.
Pscudoculex THEOBALD, Mon. Culic., vol. 4, p. 318, 1907.
Leucomyia THEOBALD, Mon. Culic., vol. 4, p. 372, 1907.
Microculex THEOBALD, Mon. Culic., vol. 4, p. 461, 1907.
Oculeomyia THEOBALD, Mon. Culic., vol. 4, p. 515, 1907.
Neomelanoconion NEWSTEAD, DUTTON, and TODD, Ann. Trop. Med. Par., vol. 1, p. 31, 1907.
Pectinopalpus THEOBALD, Ann. Mag. Nat. Hist., ser. 8, vol. 5, p. 375, 1910.
Eumelanomyia THEOBALD, Mon. Culic., vol. 5, p. 114, 1910.
Phalangomyia DYAR and KNAB, Ins. Ins. Mens., vol. 2, p. 58, 1914.
Climacura HOWARD, DYAR, and KNAB, Mosq. N. & Cent. Am. & W. I., vol. 3, p. 452, 1915.
Transculicia DYAR, Ins. Ins. Mens., vol. 5, p. 184, 1917.
Cacoculex DYAR, Ins. Ins. Mens., vol. 6, p. 100, 1918.
Choeroporpa DYAR, Ins. Ins. Mens., vol. 6, p. 103, 1918.
Helcoporpa DYAR, Ins. Ins. Mens., vol. 6, p. 125, 1918.
Eubonnea DYAR, Ins. Ins. Mens., vol. 7, p. 150, 1919.
Barraudius EDWARDS, Bull. Ent. Res., vol. 12, p. 332, 1921.

A genus of world-wide distribution, especially strong in the Tropics and warmer temperate regions, but few species extending far north. The larvae inhabit water of a permanent nature, some species taking kindly to water in artificial containers. Such species are liable to be abundant and troublesome in cities, and take on a semidomesticated nature. Many species habitually transmit blood diseases of birds and animals, but they do not play an important role in human diseases. Several transmit *Filaria*.

The subgenera occurring in the United States separate as follows on the characters of the male genitalia:

1. Tenth sternites few toothed—Subgenus **Climacura** Howard, Dyar, and Knab.
   Tenth sternites tufted with spines ..... 2.
   Tenth sternites flattened, comb shaped ..... 3.
2. Mesosome simple, one plate with a bridge ..... Subgenus **Neoculex** Dyar.
   Mesosome with complex series of plates ..... Subgenus **Culex** Linnaeus.
3. Clasper simple, uniform ..... Subgenus **Melanoconion** Theobald.
   Clasper modified, enlarged at tip ..... 4.
4. Clasper elongated, with snout-like termination—Subgenus **Choeroporpa** Dyar.
   Clasper bluntly rounded, with subspherical tip.
   Subgenus **Mochlostyrax** Dyar and Knab.

KEY TO THE UNITED STATES SPECIES OF CULEX.

1. Proboscis white ringed in the female ..... 2.
   Proboscis not, or nor completely white-ringed ..... 4.
2. White rings of the tarsi broad ..... 3.
   White rings of the tarsi narrow ..... **corniger** Theobald. **thriambus** Dyar.
3. Femora and tibia with a fine white line on outer side ..... **tarsalis** Coquillett.
   These parts black on outer side ..... **stigmatosoma** Dyar.

4. Tarsi with white rings at both ends of the joints—{**coronator** Dyar and Knab. / **thriambus** Dyar.
   Tarsi unbanded ——— 5.
5. Abdomen with apical segmental white marking——**testaceus** van der Wulp.
   Abdomen with white marking basal on segments or absent——— 6.
6. Recumbent scales of occiput narrowly curved or lanceolate——— 7.
   These scales at least in part broad and subtruncate——— 13.
7. Mesonotum red; abdomen with the bands indistinct——**erythrothorax** Dyar.
   Not so colored——— 8.
8. Scales on forks of second vein broad and ovate——**melanurus** Coquillett.
   These scales narrow, ligulate——— 9
9. Abdomen with basal segmental white bands——— 10
   Abdomen unbanded dorsally——— 12
10. Band of second abdominal segment triangularly produced——— 11
    This band transverse——**territans** Walker.
11. Abdominal bands joined to the lateral spots——**pipiens** Linnaeus.
    Abdominal bands separated from the lateral spots——**quinquefasciatus** Say
12. Lateral spots of the abdomen not visible dorsally——**salinarius** Coquillett.
    These spots visible dorsally——**similis** Theobald.
13. Mesonotum more or less golden——14.
    Mesonotum brown ——15.
14. Mesonotum bright golden (from Texas)——**pose** Dyar and Knab.
    Mesonotum moderately golden——{**egberti** Dyar and Knab. / **degustator** Dyar. / **erraticus** Dyar and Knab. / **homoeopas** Dyar and Ludlow.
15. Scales on forks of second vein ligulate——**anips** Dyar.
    These scales ovate——{**peccator** Dyar and Knab. / **floridanus** Dyar and Knab.

KEY TO THE UNITED STATES SPECIES OF CULEX BY THE MALE GENITALIA.

(*Culex* and *Choeroporpa*.)

1. (*Culex*) Lobe of sidepiece with three rods, a seta or filament, a leaf and a seta ——2.
   This part with additional appendages——4.
2. Mesosomal plate with two broad arms and a central mass of close denticles. Group **Corniger**.
   This plate not so formed——3.
3. Upper limb of mesosomal plate denticulate——Group **Tarsalis**.
   This limb entire——Group **Salinarius**.
   Mesosomal plate of two blunt teeth——Group **Territans**.
4. Lobe of sidepiece with three rods, two setae, a filament, a leaf, and a seta. Group **Pipiens**.
   Lobe of sidepiece without a leaf, divided——Group **Coronator**.
5. (*Choeroporpa*) clasper with a horn-like tuft before tip; terminal spine uniform ——6.
   Without this structure; terminal spine generally widened and appendiculate——8.
6. Anterior crest of clasper of appressed or consolidated spines——7.
   This crest composed of fine hairs——**anips** Dyar.

7. Terminal spine of clasper stout; anterior crest solid.
erraticus Dyar and Knab.
This spine delicate; anterior crest of compressed spines.
peccator Dyar and Knab.
8. Third spine of mesosomal plate subapical_____pose Dyar and Knab.
This spine medial on the stem_____9.
9. Spine of clasper larger; ninth tergites broader, remote.
egberti Dyar and Knab.
Spine of clasper smaller; ninth tergites narrower, obliquely approximated.
degustator Dyar.

Subgenus MOCHLOSTYRAX Dyar and Knab.

CULEX (MOCHLOSTYRAX) FLORIDANUS Dyar and Knab.

Mochlostyrax cubensis DYAR and KNAB (not Bigot), Jour. N. Y. Ent. Soc., vol. 14, p. 223, 1906.

Mochlostyrax floridanus DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 171, 1906.

Culex agitator DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 100, 1907.

Culex deceptor DYAR and KNAB, Smith. Misc. Colls., Quart. iss., vol. 52, p. 257, 1909.

Culex mastigia HOWARD, DYAR, and KNAB, Mosq. No. & Cent. Amer. & W. I., vol. 3, p. 426, 1915.

A very small black mosquito. Mesonotum dark brown, legs blackish, abdomen with or without basal segmental whitish bands, lateral spots present. Very uncharacteristic in markings, but distinct on the characters of larvae and male genitalia.

The larvae live in permanent water with aquatic vegetation. They have the habit of hanging themselves up on leaves, etc., by the hooks of the air tube, or often lie on the bottom, seldom coming to the surface. No observations are on record of the biting habits. The species is rare and insufficiently studied in its habits.

Distribution.—Cuba and southern States.

United States Records.

NORTH CAROLINA: Charlotte, July and August, 1915 (H. P. Barret).
FLORIDA: Estero, July 1906 (J. B. Van Duzee).
Miami, December 13, 1921 (G. F. Moznette).

Subgenus CHOEROPORPA Dyar.

CULEX (CHOEROPORPA) POSE Dyar and Knab.

Culex (*Mochlostyrax*) *pose* DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 182, 1917.

A small blackish mosquito with bright golden mesonotum. The gold color may contain two small brown spots before and be streaked with brown behind. The abdomen has distinct white bands at the bases of the segments, pointed in the middle. Wing scales on forks of second vein ligulate. The larva is unknown.

Distribution.—Central Texas and Louisiana.

United States Records.

TEXAS: Dallas, November 11, 1905 (W. E. Hinds).
Kelly Field, San Antonio, 1918 (S. M. Dohanian).
LOUISIANA: Mound, April 21, 1921 (G. H. Bradley).

CULEX (CHOEROPORPA) ERRATICUS Dyar and Knab.

Mochlostyrax erraticus DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 223, 1906.

Culex abominator DYAR and KNAB, Smith. Misc. Colls., Quart. iss., vol. 52, p. 257, 1909.

A small black mosquito, the mesonotum dark brown, with more or less of a golden tint. Abdomen dark dorsally, with variable bands and white lateral segmental spots, banded black and white below. The markings are uncharacteristic, the species only to be certainly differentiated by the male genitalia or larvae.

The larvae live in permanent bodies of water full of aquatic vegetation. The adult bites annoyingly in woods by the margins of ponds and streams. The eggs are laid quite firmly attached to a leaf or other object in the water.

Distribution.—Mississippi Valley and Texas. Some of the records below are uncertain in the absence of males.

United States Records.

ILLINOIS: Havana (R. B. Coad).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
ARKANSAS: Little Rock, August 6, 1914 (J. A. LePrince).
Scott, October 8, 1908 (J. K. Thibault).
Fort Smith, July 7, 1904 (H. S. Barber).
MISSISSIPPI: Tutwiler, August 2, 1904 (H. S. Barber).
LOUISIANA: Baton Rouge (J. W. Dupree).
TEXAS: Plano, September (E. S. Tucker).
Victoria, July 28, 1904 (E. G. Hinds).
Brownsville, June 7, 1904 (H. S. Barber).

CULEX (CHOEROPORPA) PECCATOR Dyar and Knab.

Culex peccator DYAR and KNAB, Smith, Misc. Colls., Quart. iss., vol. 52, p. 256, 1909.

Culex incriminator DYAR and KNAB, Smith. Misc. Coll., quart. iss., vol. 52, p. 257, 1909.

A small blackish mosquito, the mesonotum dark brown. Abdomen dark brown dorsally, with white basal segmental spots on the sides. Venter black and white banded, but indistinctly. The markings are uncharacteristic. The species is a close ally of *erraticus*, replacing it in the Atlantic region, but on account of distinct differences in the genitalia to be considered as a good species. The larva is much like that of *erraticus*, and the habits, so far as known, similar.

Distribution.—Atlantic and Gulf coastal regions.

United States Records.

GEORGIA: Augusta, August 26, 1918 (W. H. Dumont).
NORTH CAROLINA: Charlotte, August 24, 1917 (H. P. Barret).
Rockingham, September, 1921 (H. P. Barret).
Jacksonville, July 21, 1920 (H. P. Barret).
SOUTH CAROLINA: Hartsville, June 24, 1914 (J. A. LePrince).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
ARKANSAS: Scott, September and October, 1908 (J. K. Thibault).
Little Rock, July 11, 1904 (H. S. Barber).
MISSISSIPPI: Jackson Barracks, October 16, 1920 (Army Medical Museum).
Agricultural College, August 18, 1905 (W. V. Reed).
Tutwiler, August 2, 1904 (H. S. Barber).
Scott, May 5, 1915 (M. B. Mitzmain).

CULEX (CHOEROPORPA) EGBERTI Dyar and Knab.

Culex egberti DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 214, 1907.
Culex (*Mochlostyrax*) *peribleptus* DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 181, 1917.

A small dark mosquito, the mesonotum dark brown with traces of golden tint. Abdomen dark dorsally, with more or less distinct dorsal white dots, especially on second segment, and white lateral spots. Venter black and white banded, but indistinctly. The markings are uncharacteristic, the species only to be certainly differentiated by the male genitalia.

The larvae live in permanent water containing grass or other vegetation. The habits of the adults have not been described.

Distribution.—Florida and the southern Atlantic and Gulf coasts.

United States Records.

SOUTH CAROLINA: Parr Shoals, August 16, 1915 (T. D. H. Griffitts).
FLORIDA: Lake Okeechobee, January 1, 1906 (J. H. Egbert).
Miami, November 1, 1921 (G. F. Moznette).
Jacksonville, October 12, 1908 (H. Byrd).
MISSISSIPPI: Sibley, July 27, 1921 (A. Fleming).

CULEX (CHOEROPORPA) DEGUSTATOR Dyar.

Culex (*Choeroporpa*) *degustator* DYAR, Ins. Ins. Mens., vol. 9, p. 39, 1921.

A small blackish mosquito, the mesonotum dark brown with traces of golden tint. Abdomen dark dorsally, with white lateral spots. Venter black and white banded. The markings are uncharacteristic. This differs only slightly in genetalic characters from *egberti.* It may be considered as a local form or subspecies of this. The larva has not been described.

Distribution.—Mississippi Valley.

United States Records.

ILLINOIS: Herrin, August 27, 1920 (S. C. Chandler).
MISSOURI: Belmont, June 14, 1918 (L. Haseman).
ARKANSAS: Scott, August 11, 1909 (J. K. Thibault).
LOUISIANA: Como, August 20, 1901 (G. E. Beyer).
ALABAMA: Mobile, June 9, 1915 (R. H. von Ezdorf).

CULEX (CHOEROPORPA) ANIPS Dyar.

Culex anips DYAR, Ins. Ins. Mens., vol. 4, p. 48, 1916.

A small blackish mosquito, the mesonotum dark reddish brown. Abdomen black above, with lateral segmental basal white spots; venter grayish, very indistinctly banded. Legs black, except the femora beneath. Wing scales narrow. Very uncharacteristically marked, but easily told by the distribution, being the only *Culex* of this group from the west coast of the United States. The larva is unknown, as also the habits of the adult. The original specimens were obtained from pupae collected in a large pond in the valley of the San Diego River, the pond deep in the middle and containing fish.

Distribution.—Southern California.

United States Records.

CALIFORNIA: San Diego, May 3, 1916 (H. G. Dyar).

Subgenus MELANOCONION Theobald.

CULEX (MELANOCONION) HOMOEOPAS Dyar and Ludlow.

Culex (Melanoconion) homoeopas DYAR AND LUDLOW, Ins. Ins. Mens., vol. 9, p. 46, 1921.

A small blackish mosquito, the mesonotum dark brown with golden tint. Abdomen dark, with broad whitish segmental basal bands in the male. Venter black, with narrow white bands at the bases of the segments. Wing scales narrowly ovate in the male, probably broader in the female. An obscurely marked species, distinguished by the male genitalia, and known in only a single male, captured near New Orleans, where it may have flown ashore from a steamer from Bluefields, Nicaragua, or other southern port.

Distribution.—Unknown.

United States Records.

LOUISIANA: Jackson Barracks, October 16, 1920 (C. C. Robbins).

Subgenus NEOCULEX Dyar.

CULEX (NEOCULEX) TESTACEUS van der Wulp.[5]

Culex testaceus VAN DER WULP, Tidsc. voor Ent., ser. 2, vol. 10, p. 128, 1867.
Culex apicalis ADAMS, Kans. Univ. Sci. Bull., vol. 2, p. 26, 1903.

[5] This species was for a long time called *Culex territans;* but that name has lately been shown to belong to another species, formerly known as *Culex restuans.*

Culex sergenti THEOBALD, Mon. Culic., vol. 3, p. 218, 1903.
Culex saxatilis GROSSBECK, Can. Ent., vol. 37, p. 360, 1905.
Culex frickii LUDLOW, Can. Ent., vol. 38, p. 132, 1906.
Culex pyrenaicus BROLEMANN, Ann. Soc. Ent. France, vol. 87, p. 427, 1919.

A small blackish mosquito, readily distinguished by the white abdominal bands being apical on the segments instead of basal, though sometimes very narrow. Mesonotum with bronzy brown scales and sometimes a pair of light spots near the middle. Proboscis and legs blackish scaled, the femora whitish beneath. Wing scales narrow and hairlike, wholly dark.

The male genitalia have the mesosomal plate simple, the pair united by a bridge in a characteristic manner. Lobe of the sidepiece with two capitate rods, three flattened setae and three normal setae.

The larvae occur in grassy marshes, and can be found all summer.

The adults do not bite warm-blooded animals, but have been observed attacking frogs.

Distribution.—North America, from Mexico to Canada; Europe.

United States Records.

MAINE: Lincolnville, August, 1908 (H. G. Dyar).
MASSACHUSETTS: Westfield, August 25, 1903 (F. Knab).
RHODE ISLAND: Weekapaug, July 5, 1904 (H. G. Dyar).
NEW YORK: Bellport, August, 1902 (H. G. Dyar).
Tupper Lake, August 20, 1905 (H. G. Dyar).
Ithaca, September, 1901 (O. A. Johannsen).
NEW JERSEY: Lahaway, August (J. T. Brakeley).
PENNSYLVANIA: Norristown, July 18 (H. L. Viereck).
MARYLAND: Baltimore, June 3, 1904 (Dyar and Caudell).
DISTRICT OF COLUMBIA: Washington, June, 1903 (F. C. Pratt).
VIRGINIA: Falls Church, May 6, 1903 (H. G. Dyar).
FLORIDA: West Tampa, March 18, 1905 (Dyar and Caudell).
Jacksonville, March 4, 1905 (Dyar and Caudell).
Miami, March 7, 1905 (Dyar and Caudell).
IOWA: Ames, July 18, 1906 (H. J. Quayle).
ILLINOIS: Urbana, September, 1904 (F. Knab).
MISSOURI: St. Louis, August, 1904 (A. Busck).
ARKANSAS: Scott, October 3, 1908 (J. K. Thibault).
LOUISIANA: Baton Rouge (J. W. Dupree).
NEW MEXICO: Las Vegas Hot Springs, August 11 (H. S. Barber).
CALIFORNIA: San Diego, May 7, 1916 (H. G. Dyar).
Pasadena, June 30, 1906 (H. G. Dyar).
Stanford University (I. MacCracken).
Sisson, July 23, 1906 (Dyar and Caudell).

Subgenus CULEX Linnaeus.

Group CORONATOR.

CULEX (CULEX) CORONATOR Dyar and Knab.

Culex coronator DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 215, 1906.
Culex (Culex) usquatus DYAR, Ins. Ins. Mens., vol. 6, p. 122, 1918.

A medium-sized blackish mosquito, with brown mesonotum, usually unornamented. Proboscis dark above in the female, ringed with white in the male. Abdomen black above, with rather narrow basal segmental white bands, widening in the middle; venter whitish, with few black scales toward apices of segments. Legs blackish, the femora and tibiae white on the under side; tarsi ringed with white at both ends of the joints, usually narrowly so.

The larvae are common in ground puddles in the open country. No observation of the insect biting are of record.

Distribution.—North coast of South America from the Guianas to Panama, Central America, Mexico, southern Texas.

United States Records.

TEXAS: San Benito, August 21, 1920 (H. G. Dyar).

Group PIPIENS.

CULEX (CULEX) QUINQUEFASCIATUS Say.

Culex quinquefasciatus SAY, Journ. Acad. Nat. Sci. Phil., vol. 3, p. 10, 1823.
Culex pungens WIEDEMANN (not Robineau-Desvoidy), Auss. Zweifl. Ins., vol. 1, p. 9, 1828.
Culex fatigans WIEDEMANN, Auss. Zweifl. Ins., vol. 1, p. 9, 1828.
Anopheles ferruginosus WIEDMANN, Auss. Zweifl. Ins., vol. 1, p. 12, 1828.
Culex cubensis BIGOT, Hist. fisc. Ins. Cuba, vol. 7, p. 329, 1856.
Culex penafieli WILLISTON, La Naturaleza, vol. 7, p. 326, 1887.
Culex skusii GILES, Gnats or Mosq., p. 292, 1900.
Culex quasipipiens THEOBALD, Mon. Culic., vol. 2, p. 136, 1901.
Culex fouchowensis THEOBALD, Mon. Culic., vol. 2, p. 137, 1901.
Culex osakaensis THEOBALD (in part), Mon. Culic., vol. 4, p. 439, 1907.
Culex christopherii THEOBALD, Mon. Culic., vol. 4, p. 453, 1907.
Culex aikenii DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 35, p, 61. 1908.
Culex lachrimans DYAR and KNAB, Smith. Misc. Colls., Quart. iss., vol. 52, p. 295, 1909.
Culex revocator DYAR and KNAB, Smith. Misc. Colls., Quart. iss., vol. 52, p. 256, 1909.
Culex goughii THEOBALD (part), Union S. Africa, Dept. Agr., 1st Rept. Vet. Res., p. 269, 1911.
Culex aseyehae DYAR and KNAB, Ins. Ins. Mens., vol. 3, p. 112, 1915.

A medium-sized reddish-brown mosquito, the mesonotum with narrow curved reddish-brown scales; legs and proboscis blackish scaled, the femora pale brown at base. Abdomen blackish above,

with moderate basal segmental whitish bands, separated from the lateral spots. Wing scales narrow and hairlike, wholly dark.

The male genitalia have the third plate of the mesosome pointed and straight, the second plate very long and straplike.

The larvae occur in artificial receptacles by preference, but are also found in ground pools, even far from habitations.

This is the common house mosquito of the Tropics, extending in America to about latitude 35° north and south.

Distribution.—Tropical countries throughout the world.

United States Records.

DISTRICT OF COLUMBIA: Washington, November 4, 1903 (W. V. Warner).
VIRGINIA: Alexandria, September 23, 1899 (F. C. Pratt).
SOUTH CAROLINA: Columbia, September 12, 1908 (W. H. Sligh).
GEORGIA: Myrtle, August 26, 1906 (A. A. Girault).
FLORIDA: Jacksonville, June 20, 1906 (H. Byrd).
Key West, June 7, 1903 (E. A. Schwarz).
KENTUCKY: Richmond, August 25, 1904 (H. S. Barber).
TENNESSEE: Columbia, August 16, 1904 (H. S. Barber).
MISSISIPPI: Magnolia, July 19, 1901 (G. W. Herrick).
LOUISIANA: Baton Rouge, December 5, 1904 (E. S. G. Titus).
OHIO: Cincinnati, September 21, 1904 (T. H. C.).
ILLINOIS: Cairo, July 25, 1904 (H. S. Barber).
MISSOURI: St. Louis, May 13, 1906 (Capt. Chamberlain).
KANSAS: Lawrence, July (E. S. Tucker).
ARKANSAS: Hot Springs, October 1, 1900 (A. Wright).
TEXAS: Corpus Christi, October 20, 1905 (F. C. Pratt).
ARIZONA: Fort Yuma (E. E. Wilcox).
CALIFORNIA: Coachella, June 9, 1906 (A. N. Caudell).

CULEX (CULEX) PIPIENS Linnaeus.

Culex pipiens LINNAEUS, Syst. Nat., ed. 10, p. 602, 1758.
Culex consobrinus ROBINEAU-DESVOIDY, Mem. Soc. d'Hist. Nat. Paris, vol. 3, p. 408, 1827.
Culex flavipes MACQUART, Dipt. Exot., vol. 1, pp. 1, 35, 1838.
Culex haematophagus FICALBI, Bull. Soc. Ent. Ital., vol. 28, p. 287, 1893.
Culex pallens COQUILLETT, Proc. U. S. Nat. Mus., vol. 21, p. 303, 1898.
Culex varioannulatus THEOBALD, Mon. Culic., vol. 3, p. 198, 1903.
Culex azoriensis THEOBALD, Mon. Culic., vol. 3, p. 210, 1903.
Culex osakaensis THEOBALD (female), Mon. Culic., vol. 4, p. 439, 1907.
Culex comitatus DYAR and KNAB, Proc. Ent. Soc. Wash., vol. 11, p. 35, 1909.
Culex quasiguiarti THEOBALD (female), Mon. Culic., vol 5, p. 374, 1910.

A medium-sized reddish brown mosquito, the mesonotum with narrow curved reddish brown scales; legs and proboscis blackish scaled, the femora pale below at base. Abdomen blackish above, with moderate basal segmental whitish bands, joining the lateral spots, the band at the base of the second abdominal segment somewhat triangular. Wing scales narrow and hairlike, wholly dark.

Male genitalia with the second mesosomal plate narrow and straplike, the third oblique truncate at tip, tubelike, the lobe of the sidepiece with three rods, two setae, a filament, a leaf, and a seta.

The larvae occur in artificial receptacles by preference, but are also found in ground pools when soiled by animal refuse.

This is the common house mosquito of Europe, introduced by commerce into various temperate regions. It does not persist in the tropics. On the Pacific coast, the introduction was from Japan, with slight genitalic differences (form *pallens* Coquillett=*comitatus* Dyar and Knab).

Distribution.—Europe and Asia, from England to Japan; South America, Argentina and Chile; North America, Virginia to Canada on the Atlantic and California to British Columbia on the Pacific.

United States Records.

NEW HAMPSHIRE: Durham (H. G. Dyar).
MASSACHUSETTS: West Springfield (F. Knab).
CONNECTICUT: Fairfield, August, 1910 (V. Havard).
NEW YORK: Ithaca (O. A. Johannsen).
PENNSYLVANIA: Williamsport (H. L. Viereck).
DISTRICT OF COLUMBIA: Washington, October 20 (H. G. Dyar).
VIRGINIA: Virginia Beach, September 20, 1911 (H. G. Dyar).
ILLINOIS: Urbana (F. Knab).
OHIO: Toledo, September 13, 1915 (T. L. Ramsey).
CALIFORNIA: San Diego, December 25, 1916 (H. G. Dyar).
San Juan Capistrano, August 7, 1920 (H. G. Dyar).
Laguna Beach, July 13, 1915 (W. E. Hilton).
Roseville, August 20, 1916 (H. G. Dyar).
WASHINGTON: Vancouver Barracks (Army Medical Museum).

Group TERRITANS.

CULEX (CULEX) TERRITANS Walker.

Culex territans WALKER, Ins. Saund., Dipt., vol. 1, p. 428, 1856.
Culex restuans THEOBALD, Mon. Culic., vol. 2, p. 142, 1901.
Culex brehmei KNAB, Proc. Biol. Soc. Wash., vol. 29, p. 161, 1916.

A medium-sized reddish-brown mosquito, the proboscis and legs all dark, or the tarsi with faint pale brownish rings at the ends of the joints. Mesonotum with narrow curved bronzy brown scales, often ornamented with little patches of light yellowish ones on each side of the middle; but these light spots may be wanting. Abdomen blackish brown above, with moderate basal segmental whitish bands, transverse and even; venter whitish scaled, often with dusky angular transverse bands, the cusps directed anteriorly. Wing scales fine and hairlike, all brown.

The male genitalia have the second mesosomal plate short and pointed, without denticles. Lobe of the side piece with three rods, a seta, a leaf and a seta.

The larvae live in dirty ground puddles, and take rather readily to artificial receptacles, such as water barrels. The adults readily enter houses, thus making this the common house mosquito of northern New York and New England.

Distribution.—Eastern North America, Gulf of Mexico to Canada.

United States Records.

MAINE: Lincolnville, August, 1908 (H. G. Dyar).
NEW HAMPSHIRE: Center Harbor, August 22, 1903 (H. G. Dyar).
MASSACHUSETTS: West Springfield, June to October, 1903 (F. Knab).
NEW YORK: Tupper Lake, August, 1905 (H. G. Dyar).
NEW JERSEY: Newark, June 12, 1916 (H. H. Brehme).
MARYLAND: Plummer Island, November 2 (H. G. Dyar).
VIRGINIA: Virginia Beach, August 31, 1903 (E. A. Schwartz).
WEST VIRGINIA: Kanawha Station, August 16, 1903 (A. D. Hopkins).
NORTH CAROLINA: Black Mountains, June 2, (W. Beutenmueller).
FLORIDA: Jacksonville, March 4, 1905 (H. G. Dyar).
MISSISSIPPI: Agricultural College, June to December, 1900 (G. W. Herrick).
MINNESOTA: St. Anthony Park, July (F. L. Washburn).
IOWA: Ames, July 11, 1919 (F. C. Bishopp).
ILLINOIS: Rockford, September 3, 1917 (Lieut. Hirsch).
OHIO: New Richmond, August 5, 1907 (A. A. Girault).
MISSOURI: St. Louis, September, 1904 (A. Busck).
ARKANSAS: Little Rock, July 11, 1904 (H. S. Barber).
OKLAHOMA: Wister, August 3, 1904 (H. S. Barber).
TEXAS: Denison, June 24, 1904 (H. S. Barber).
CALIFORNIA: Little Truckee River, May 7, 1921 (H. G. Dyar).

Group SALINARIUS.

CULEX (CULEX) ERYTHROTHORAX Dyar.

Culex erythrothorax DYAR, Proc. U. S. Nat. Mus., vol. 32, p. 124, 1907.

A medium-sized reddish mosquito, the mesonotum red in the integument and with fine reddish scales, the abdomen blackish above with pale lateral basal segmental spots; venter yellowish scaled. Legs blackish scaled, the femora pale beneath. Wing scales narrow, all dark.

The scales on the mesonotum are fine and hairlike. In the male genitalia, the tenth sternites have a tuft of spines, two of them on the outer side stout and toothlike; mesosomal plate with six to eight even teeth between the upper and lower limbs.

The larvae live in long-standing or permanent ponds containing aquatic vegetation and even fish. They rest at the surface among *Lemna* in the reeds and are evidently not readily detected by the fish.

Distribution.—Southern California.

United States Records.

CALIFORNIA: San Diego, May and June, 1916 (H. G. Dyar).
San Onofre, June 27, 1906 (H. G. Dyar).
Gardena, May 30, 1906 (H. G. Dyar).
Sweetwater Junction, June 2, 1906 (Dyar and Caudell).
Guadaloupe, June 25, 1906 (A. N. Caudell).
Salinas, June 25, 1906 (H. G. Dyar).

CULEX (CULEX) SALINARIUS Coquillett.

Culex salinarius COQUILLET, Ent. News, vol. 15, p. 73, 1904.

A medium-sized brown mosquito, the mesonotum brown in the integument with fine narrow brown scales. Abdomen blackish above, with or without narrow basal segmental whitish bands, joining the lateral spots; venter yellowish. Legs blackish scaled, the femora pale beneath. Wing scales narrow, all dark.

The scales on the mesonotum are very fine and hairlike. In the male genitalia the tenth sternites have a tuft of spines, two or three of them on the outer side stout and toothlike; mesosomal plate with four or five even teeth between the large upper and lower limbs.

The larvae live in permanent pools in marshes, containing grass and *Lemna*. Frequently very abundant near the seashore, and hence named; but also occurring inland, even in water barrels on occasion.

Distribution.—United States, east of the Great Plains.

United States Records.

MASSACHUSETTS: West Springfield, August, 1903 (F. Knab).
NEW JERSEY: Seacaucus, July 27, 1921 (W. R. Bryce-Delaney).
PENNSYLVANIA: Altoona (H. L. Viereck).
MARYLAND: Chesapeake Beach, June 17 (H. G. Dyar).
DISTRICT OF COLUMBIA: Georgetown (A. N. Caudell).
VIRGINIA: Arlington, August 28, 1917 (H. G. Dyar).
NORTH CAROLINA: Wilmington, July 22, 1918 (W. R. Leiby).
GEORGIA: Savannah, June 23, 1920 (V. H. Bassett).
FLORIDA: Jacksonville (Army Medical Museum).
LOUISIANA: Baton Rouge (H. A. Morgan).
MISSOURI: St. Louis, September, 1904 (A. Busck).
KENTUCKY: Corbin, August 24, 1904 (H. S. Barber).
ILLINOIS: Cairo, July 25, 1904 (H. S. Barber).
IOWA: Ames, August 14, 1906 (H. J. Quayle).
ARKANSAS: Little Rock (Army Medical Museum).

CULEX (CULEX) SIMILIS Theobald.

Culex similis THEOBALD, Mon. Culic., vol. 3, p. 207, 1903.
Culex microsquamosus GRABHAM, Can. Ent., vol. 37, p. 407, 1905.
Culex carmodyae DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 210, 1906.
Culex regulator DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 213, 1906.
Culex prasinopleurus MARTINI, Ins. Ins. Mens., vol. 20, p. 68, 1914.

A medium-sized, blackish mosquito, the mesonotum dark brown with fine, narrow, blackish scales. Abdomen black above, with or without narrow segmental basal whitish bands, joining the lateral spots; venter whitish scaled, with diffuse black bands at the apices of the segments. Legs black, the femora whitish beneath, tips of tibiae white. Wing scales narrow, all dark.

The scales on the mesonotum are very fine and hairlike, giving a velvety appearance. The tenth sternites of the male genitalia have a tuft of spines, the outer three or six of them stout and toothlike; mesosomal plate with two or more even teeth and a small one between the upper and lower limbs, the tooth from the base very long, with radial pecten between its base and the margin.

The larvae live in permanent pools in swamps and holes in coral rock, usually without vegetation, sometimes occurring in clear wells.

Distribution.—Greater Antilles and southern Florida. The species is considered a race of the earlier described *Culex nigripalpus* Theobald,[6] which inhabits the tropical mainland from Trinidad to Panama and Central America.

United States Records.

FLORIDA: Miami, October 29, 1921 (G. F. Moznette).
Pokatee, March 19, 1905 (A. N. Caudell).
Green Cove Springs, 1905 (A. N. Caudell).
Jacksonville, March 4, 1905 (H. G. Dyar).

Group TARSALIS.

CULEX (CULEX) TARSALIS Coquillett.

Culex tarsalis COQUILLETT, Can. Ent., vol. 28, p. 43, 1896.
Culex willistoni GILES, Handb. Gnats or Mosq., p. 281, 1900.
Culex affinis ADAMS, Kans. Univ. Bull, vol. 20, p. 25, 1903.
Culex kelloggii THEOBALD, Can. Ent., vol. 25, p. 211, 1903.
Culex peus SPEISER, Insektenbörse, vol. 21, p. 148, 1904.

A medium-sized mosquito, the mesonotum bronzy-brown scaled, frequently ornamented with narrow silvery-white lines each side of the posterior portion, running back to the scutellum. The abdomen is blackish or brown, with moderate basal segmental white bands, the one on the basal segment triangular; venter whitish scaled, with angular transverse black bands, which form cusps directed posteriorly. Proboscis dark, with a white ring near the middle. Legs brown, the femora white beneath, the tarsi with white rings at both ends of the joints, small on front and middle legs, distinct on the hind pair, a white line on the outer side of femora and tibiae. Wing scales wholly dark, fine and hairlike, forming a little tuft at the base of the third vein.

[6] See Dyar, Ins. Ins. Mens., vol. 9, p. 28, 1921, for the synonymy.

The male genitalia have the mesosomal plate large and furnished with denticles between the arms, the outer arm serrate. The lobe of the sidepiece has three rods, a seta, a leaf, and a seta. The tenth sternites have all the spines long and alike.

The larvae are commonly found in grassy ponds or marshes, often in escaping irrigation water. They do not take to artificial receptacles.

This mosquito will enter houses and may become a considerable nuisance in the western part of the country.

Distribution.—Mississippi Valley and western prairies to the Pacific Ocean, Mexico to British Columbia.

United States Records.

WASHINGTON: Bellingham, May 31, 1917 (H. G. Dyar).
Oroville, July 28, 1920 (H. G. Dyar).
OREGON: Portland (R. P. Currie).
Hood River, July 9, 1917 (F. R. Cole).
CALIFORNIA: San Diego, April 14, 1906 (J. M. French).
Stanford University, 1901 (I. MacCracken).
Kelly Hot Springs, June 15, 1916 (W. B. Herms).
IDAHO: Boise, August 14, 1901 (C. B. Simpson).
NEVADA: Reno, November 5, 1915 (H. G. Dyar).
ARIZONA: Carr, August, 1905 (H. Skinner).
NEW MEXICO: Springer, August, 1909 (C. N. Ainslie).
COLORADO: Boulder, October 15 (T. D. A. Cockerell).
KANSAS: Lawrence, June (E. S. Tucker).
IOWA: Ames, October 18, 1905 (H. J. Quayle).
ILLINOIS: Urbana, September 10, 1904 (A. Busck).
MISSOURI: St. Louis, September, 1904 (A. Busck).
TEXAS: Dallas, May 11, 1905 (W. D. Pierce).
Devils River, May 6, 1907 (F. C. Pratt).

CULEX (CULEX) THRIAMBUS Dyar.

Culex (Culex) thriambus DYAR, Ins. Ins. Mens., vol. 9, p. 33, 1921.

A medium-sized brown mosquito, the mesonotum bronzy brown. Abdomen blackish, with basal segmental white bands, widened in the middle; venter pale, with angular black marks on the posterior borders of the segments, the cusps directed forward. Proboscis broadly whitish below, ringed with white in the male and sometimes also in the female. Legs black, the femora and tibiae pale below, tarsi ringed with white on both ends of the joints, rather broadly so on the hind legs. Wing scales narrow and dark.

The genitalia do not differ markedly from those of *tarsalis* and *stigmatosoma.* The species is close to *stigmatosoma* and may be an eastern race of it. The larvae have the hairs on the air tube single, whereas they are multiple in *stigmatosoma.*

Only one occurrence of this form is yet of record, larvae in pools in the bed of a river which had recently been filled by a freshet from rains.

Distribution.—Central Texas.

United States Records.

TEXAS: Kerrville, August 20, 1920 (H. G. Dyar).

CULEX (CULEX) STIGMATOSOMA Dyar.

Culex stigmatosoma DYAR, Proc. U. S. Nat. Mus., vol. 32, p. 123, 1907.
Culex eumimetes DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 35, p. 61, 1908.

A medium-sized or rather large brown mosquito, the mesonotum dark brown with more or less of ornamentation of posterior silvery lines. Abdomen blackish, with basal segmental white bands, widened in the middle; venter pale, with a round black spot posteriorly on each segment, more or less developed. Legs black, the femora pale beneath, the tarsi ringed with white on both ends of the joints, narrowly so on the front and mid legs, broadly so on the hind. No white line on the outside of femora or tibiae, though these parts may be whitish beneath. Wing scales narrow, black.

The male genitalia are not different enough from those of *tarsalis* to be diagnostic.

The larvae inhabit pools left in the beds of streams when these have gone dry after the seasonal rains in the arid country. They may occur also in pools of artificial formation in the same region, even fountains or water troughs for horses.

Distribution.—The arid west coastal region from Central America and Mexico to Oregon.

United States Records

CALIFORNIA: San Diego, May, 1916 (H. G. Dyar).
San Luis Obispo, June, 1906 (A. N. Caudell).
Chico, June, 1906 (A. N. Caudell).
OREGON: Klamath Falls, July, 1906 (Dyar and Caudell).

Group CORNIGER.

CULEX (CULEX) CORNIGER Theobald.

Culex corniger THEOBALD, Mon. Culic., vol. 3, p. 173, 1903.
Culex lactator DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 205, 1906.
Culex hassardii GRABHAM, Can. Ent., vol. 38, p. 167, 1906.
Culex basilicus DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 169, 1906.
Culex lactator loquaculus DYAR and KNAB, Smith. Misc. Colls., Quart. iss., vol. 52, p. 254, 1909.
Culex leucotelus MCCORMACK, Panama Health Rep., 1918, p. 29, 1919.

A medium-sized blackish mosquito, the mesonotum with dark brown scales in the middle, generally conspicuously ornamented with

gray scales around the margins and a pair of dots in the middle. Abdomen black dorsally, banded or with a row of small segmental spots or none, lateral basal white spots, the venter pale, banded with black on the posterior borders of the segments. Proboscis with a white ring in both sexes. Tarsi ringed with white at both ends of the joints, narrowly so, even on the hind legs. Wing scales fine, all dark.

The larvae occur in ground pools, by preference dirty ones, also in containers even of small size, having been taken in coconut husks and bamboo joints. The water in these is especially foul. The larvae are readily recognized by the peculiar short air tube, suggesting that of an *Aëdes*.

Distribution.—Tropical America, Mexico, Central America, Ecuador, the Guianas, Antilles and Florida Keys.

United States Records.

Florida; Knight's Key, December 2, 1908 (W. H. Sligh).

Subgenus CLIMACURA Howard, Dyar, and Knab.

CULEX (CLIMACURA) MELANURUS Coquillett.

Culex melanurus COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 193, 1902.

A dark-brown mosquito, rather over middle size, the abdomen wholly blackish above, without white bands. Proboscis and legs blackish, the femora narrowly whitish beneath. Mesonotum with dark brown scales and conspicuous dark setae. The abdomen has pale triangular basal segmental spots on the sides, the venter pale, with faint darker bands at the apices of the segments. The wing scales are long, dense, and broader than usual, being ligulate, rather than hairlike, all dark brown.

The male genitalia have the mesosome membranous and paired, with an outwardly directed basal chitinization. Sidepiece without lobe, the basal excavation with three stout setae at its tip.

The larvae live in small collections of permanent water in swamps, and are very peculiar in passing the winter as full-grown larvae under the ice. The eggs appear to be laid singly on the surface of water in the summer time. No observations are on record of the biting habits of the adult. The mosquito is rare, and in no way troublesome.

Distribution.—Gulf of Mexico and Atlantic watershed to northern New York and New Hampshire, presumably in southern Canada.

United States Records.

NEW HAMPSHIRE: Center Harbor, August 19, 1902 (H. G. Dyar).
MASSACHUSETTS: Westfield, August, 1903 (F. Knab).
NEW YORK: Tupper Lake, August 11, 1905 (H. G. Dyar).

NEW JERSEY: Lahaway, March 27 (J. T. Brakeley).
VIRGINIA: Alexandria, September 22, 1899 (F. C. Pratt).
Lake Drummond, October 29, 1906 (H. S. Barber).
SOUTH CAROLINA: Hartsville, June 24, 1914 (J. A. LePrince).
GEORGIA: Augusta, August 10, 1909 (W. V. Reed).
ARKANSAS: Scott, April 16, 1914 (J. K. Thibault).

Genus CULISETA Felt.[1]

Theobaldia NEVEU-LEMAIRE, C. R. Soc. Biol., vol. 54, p. 1331, 1902.
Culiseta FELT, Bull. 79, N. Y. Sta. Mus., p. 391*c*, 1904.
Theobaldinella BLANCHARD, Les Moust., p. 390, 1905.
Pseudotheobaldia THEOBALD, Mon. Culic., vol. 4, p. 150, 1907.
Allotheobaldia BROLEMANN, Ann. Soc. Ent. France, vol. 88, p. 90, 1919.

The species of *Culiseta* are large mosquitoes, inhabiting temperate latitudes in both Europe and America. The genus contains but a small number of species. The larvae inhabit permanent water, the eggs of *Culiseta* proper being deposited in rafts by overwintering females. Some of the species take kindly to artificial containers, but the adults rarely attack man, preferring larger mammals such as horses and cattle.

Two subgenera may be recognized on the characters of the male genitalia, as follows:

1. Unci divided into two outwardly directed plates----Subgenus **Culicella** Felt.
   Unci undivided----Subgenus **Culiseta** Felt.

KEY TO THE UNITED STATES SPECIES OF CULISETA.

1. Tarsi with faint whitish rings at both ends of the joints; wings narrow as in *Culex*----**dyari** Coquillett.
   Tarsal rings if present basal; wings broader---- 2
2. Tarsi with broad white rings at the bases of some of the joints; wings spotted---- 3
   Tarsi with very narrow white rings; wings spotted----**incidens** Thomson.
   Tarsi without white rings; wings sunspotted---- 4
3. Mid and hind femora with white rings----**maccrackenae** Dyar and Knab.
   Femora without white rings----**alaskaensis** Ludlow.
4. Wing scales narrow, hairlike; no scales on the cross veins-**impatiens** Walker.
   Wing scales broader; scales sometimes present on the cross veins.
   inornatus Williston.

Subgenus CULICELLA Felt.

CULISETA (CULICELLA) DYARI Coquillett.

Culex dyari COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 192, 1902.
Culex brittoni FELT, Ent. News, vol. 16, p. 79, 1905.

A rather large dark-brown mosquito. Mesonotum with two bare impressed light brown lines, the vesiture sparse, forming frosted lines, mixed with setae. Abdomen with rather broad whitish bands

[1] *Theobaldia* of European writers.

at the bases of the segments. Legs dark brown, with obscure, narrow pale rings, involving both ends of the tarsal joints; venter pale sordid, with dark bands at the apices of the segments. Proboscis entirely blackish.

The male genitalia have the mesosome divided into two plates.

The larvae are found in spring in cold bogs, apparently developing from overwintering eggs, but nothing certain is known about the habits of the species. No observations of its biting are on record. The males are attracted rather freely to light.

Distribution.—Northern forests, in cold bogs southward to New Jersey.

United States Records.

NEW HAMPSHIRE: Center Harbor, May, 1902 (H. G. Dyar).
Dublin (A. Busck).
MASSACHUSETTS: Wilmington, July, 1910 (H. S. Barber).
Springfield, May, 1903 (F. Knab).
CONNECTICUT: Suffield, May 12, 1903 (F. Knab).
NEW YORK: Tupper Lake, August 16, 1905 (H. G. Dyar).
McLean, July 9, 1910 (B. K. Miller).
NEW JERSEY: Culvers Lake, May 29, 1908 (J. B. Smith).
WISCONSIN: Saxeville, May, 1910 (B. K. Miller).

Subgenus CULISETA Felt.

CULISETA (CULISETA) ALASKAËNSIS Ludlow.

Theobaldia alaskaënsis LUDLOW, Can. Ent., vol. 38, p. 326, 1906.
Culiseta siberiensis LUDLOW, Ins. Ins. Mens., vol. 7, p. 151, 1919.
Theobaldia arctica EDWARDS, Bull. Ent. Res., vol. 10, p. 136, 1920.

A very large blackish mosquito. Proboscis dark brown, palpi with small white tips at the ends of the joints. Mesonotum uniformly colored, without impressed lines, the vestiture of black and white narrow curved scales, appearing coarsely frosted. Abdomen black, with basal segmental white bands, the venter mostly whitish scaled. Legs black mixed with some white scales, femora whitish beneath, femora and tibiae with a white line on the outer side; tarsi with white rings at the bases of the joints, mostly small; but large on the second and third joints of the hind legs. Wings broad, the cross veins in line; scales black, mixed with some white ones along costa, forming tufts or spots at the bases of first, third, and fourth veins and the forks of second, fourth, and fifth.

The male genitalia have the aedoeagus simple, the penultimate segment without spines.

The larvae live in grassy marshes, generally in river valleys. The adults pass the winter hiding in hollow logs and similar locations, and appear very early in the spring. The eggs are deposited in rafts on the surface of the water. The adults will attack man, but are never numerous or particularly troublesome.

Distribution.—Northern Europe and America; Scotland; Siberia; Alaska, to the Yukon Valley.

United States Records.

ALASKA: Koyukuk River, "summer" 1901 (W. J. Peters).
Eagle, June 2, 1906 (Army Medical Museum).
Unalakleet, May 29, 1921 (S. Hadwen).
Beaver Mountains, May 26, 1917 (A. K. Twitchell).
Kevalina, July 31, 1921 (S. Hadwen).

CULISETA (CULISETA) MACCRACKENAE Dyar and Knab.

Culiseta maccrackenae DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 133, 1906.

A large dark mosquito with conspicuously spotted wings; mesonotum dark brown, frosted with white, with two narrow white lines posteriorly. Abdomen black above, with narrow white bands at the bases of the segments; venter yellowish white with scattered black scales. Legs blackish, the mid and hind femora with white rings, the tarsi with broad white rings at the bases of the second to fourth joints. Wing broad, the membrane infuscated, forming brown spots at origin of second vein, end of cell and bases of forks, the scales narrow, dark, existing also on the cross veins.

The larvae inhabit pools in stream beds in late spring or early summer after the streams have become sluggish, the pools containing much aquatic vegetation. The larva, however, has not been described. The species is remarkably rare.

Distribution.—Coastal region of California.

United States Records.

CALIFORNIA: Eureka, June 3 (H. S. Barber).
Presidio, San Francisco, July 4, 1906 (Army Medical Museum).
Stanford University, March, June, 1903 (I. MacCracken).
Bakersfield, May 27, 1918 (H. E. Woodworth).

CULISETA (CULISETA) INCIDENS Thomson.

Culex incidens THOMSON, Kongl. Sven. Freg. Eug. Resa, pt. 6, Dipt., p. 443, 1868.
Culex particeps ADAMS, Kans. Univ. Sci. Bull., ser. 2, vol. 2, p. 26, 1903.

A large dark mosquito with spotted wings. Mesonotum uniform, without impressed lines; vestiture dark, mixed with yellowish white scales, which form diffuse longitudinal lines, and a spot on each side. Abdomen black, with basal segmental white bands; venter whitish scaled. Legs black, the femora whitish below, the tibiae also more or less whitish within; tarsi with white specks at the bases of the joints, a rather distinct ring at the base of the second hind tarsal. Wings broad, the cross veins in line, or nearly so; wing scales black, hair-

like, forming more or less conspicuous spots on the bases of the forks of the second and fourth veins, and along the second and fourth veins within the cross veins.

The male genitalia have the aedoeagus simple; a short row of spines on the penultimate segment.

The larvae live in permanent pools of a dirty character, and take readily to artificial receptacles, this being the common water-barrel mosquito of the West. The adults hibernate; the eggs are laid in narrow rafts on the surface of water. The adults will attack man, but rarely, preferring larger mammals. A man on horseback is generally immune, though the horse may be bitten.

Distribution.—Northern Rocky Mountains and the Pacific coast from southern California to Alaska.

United States Records.

NEW MEXICO: Las Vegas Hot Springs, August 12 (H. S. Barber).
Santa Fe, July (T. D. A. Cockerell).
ARIZONA: Grand Canyon, May, 1906 (H. G. Dyar).
CALIFORNIA: San Diego, February 3, 1906 (J. M. French).
Los Angeles, June 10, 1906 (H. G. Dyar).
Stanford University, October 11, 1900 (I. MacCracken).
Lake Tahoe, June 8, 1916 (H. G. Dyar).
Dunsmuir (A. N. Caudell).
NEVADA: Reno, August 18, 1915 (H. G. Dyar).
Glenbrook, August 29, 1915 (H. G. Dyar).
OREGON: Portland (R. P. Currie).
Forest Grove, August 31, 1920 (Edna Bond).
Hood River, July 22, 1917 (F. R. Cole).
WASHINGTON: Bellingham, May 31, 1917 (H. G. Dyar).
Ashford, June 18, 1917 (H. G. Dyar).
Lake Cushman, July 4, 1920 (H. G. Dyar).
MONTANA: Big Fork (E. Ricker).
ALASKA: Cape Fanshaw, June 26, 1919 (H. G. Dyar).

CULISETA (CULISETA) IMPATIENS Walker.

Culex impatiens WALKER, List Dipt. Brit. Mus., vol. 1, p. 5, 1848.
Culex pinguis WALKER, Lord's Nat. in Vanc. Is. & B. C., vol. 2, p. 337, 1866.
Culex absobrinus FELT, Bull. 79, N. Y. State Mus., p. 391c, 1904.

A very large dark-brown mosquito. Proboscic and palpi black. Mesonotum with two broad impressed lighter brown lines, the vestiture sparse, and forming frosted yellowish lines on each side posteriorly. Abdomen black, with basal segmental white bands; venter mostly whitish. Legs black, the femora white beneath; knee spots pale. Wings broad, the cross veins nearly in line, the scales all blackish, coarsely linear; a small tuft at base of third vein, but no scales on the cross veins.

The male genitalia have the aedoeagus simple; a long row of spines on the penultimate segment.

The larvae live in dark permanent pools in the forest, where they are frequently much preyed upon by *Eucorethra underwoodi* larvae. The adults hibernate; the eggs are deposited in broad roundly triangular rafts on the surface of the water.

Distribution.—Northern forests from the Atlantic to Pacific, mountains of California to Alaska.

United States Records.

MAINE: Weld, August, 1910 (H. G. Dyar).
NEW HAMPSHIRE: Monadnock, May 11, 1911 (A. H. Thayer).
NEW YORK: Elizabethtown, April 25, 1905 (H. G. Dyar).
Tupper Lake (H. G. Dyar).
MONTANA: Glacier Park, July 1, 1921 (H. G. Dyar).
WASHINGTON: Glacier, June 4, 1917 (H. G. Dyar).
Lake Cushman, June 27, 1917 (H. G. Dyar).
Longmire Springs, June 14, 1917 (H. G. Dyar).
OREGON: Crater Lake, July 29, 1920 (H. G. Dyar).
CALIFORNIA: Lake Tahoe, June 5, 1916 (H. G. Dyar).
ALASKA: Iditarod, June 12, 1918 (A. K. Twitchell).
Yakutat, June 21, 1899 (T. Kincaid).
Dead Horse, June 18, 1921 (J. M. Aldrich).
Anchorage, July 19, 1921 (J. M. Aldrich).
Sitka, June 16, 1899 (T. Kincaid).
Skagway, August 4, 1919 (H. G. Dyar).
Cape Fanshaw, June 22, 1919 (H. G. Dyar).

CULISETA (CULISETA) INORNATUS Williston.

Culex inornatus WILLISTON, U. S. Dept. Agr., Div. Orn. & Mam., N. Am. Fauna No. 7, p. 253, 1893.
Culex magnipennis FELT, Bull. 79, N. Y. State Mus., p. 278, 1904.

A very large brown mosquito. Proboscis and palpi brown. Mesonotum with two pale brown, slightly impressed lines, the vestiture crossing these, of pale yellowish and dark scales mixed. Abdomen dark brown, with diffused pale yellow basal segmental bands, and scattering scales over the rest; venter sparsely pale yellow scaled. Legs dark brown, with scattered pale scales, the femora and tibiae pale below; tarsi nearly black. Wings broad, the cross veins somewhat approximated, but not very close, long from the breadth of the wing and generally with a few scales; wing scales linear, all dark, not forming any spots.

The male genitalia have the aedoeagus slender and crested; penultimate segment without spines.

The larvae live in permanent ground pools. They do not come in artificial receptacles. The adults hibernate, and the eggs are laid in elongate rafts on the surface of water. The adult is not troublesome, probably attacking by preference the larger mammals.

Distribution.—North America, from Mexico to southern Canada, exclusive of the northern forests.

United States Records.

NEW YORK: (E. P. Felt).
MASSACHUSETTS: Beverly, September 28, 1870 (G. Dimmock).
DISTRICT OF COLUMBIA: Washington, April 23, 1903 (W. V. Warner).
NORTH CAROLINA: Wilmington, March 7, 1919 (M. Kisliuk, Jr.).
SOUTH CAROLINA: Charlestown, April, 1913 (R. L. Watson).
FLORIDA: Jacksonville, March 4, 1905 (H. G. Dyar).
ALABAMA: Mobile, March, 1905 (G. Dimmock).
MISSISSIPPI: Agricultural College, April 12, 1903 (G. W. Herrick).
LOUISIANA: Baton Rouge, November, 1902 (J. W. Dupree).
TEXAS: Dallas, November 10, 1905 (W. E. Hinds).
ARKANSAS: Hot Springs, November 26, 1900 (J. J. Curry).
KANSAS: Lawrence, (J. M. Aldrich).
MISSOURI: St. Louis, July, 1904 (A. Busck).
ILLINOIS: Urbana, September 29, 1904 (F. Knab).
WISCONSIN: Madison (S. J. Holmes).
SOUTH DAKOTA: Brookings, (J. M. Aldrich).
Mitchell, October, 1902 (E. L. Fullmer).
Dillon, October, 1902 (R. A. Cooley).
MONTANA: Lake View, August 2, 1920 (A. N. Caudell).
IDAHO: Boise, August 1 (C. B. Simpson).
UTAH: Garfield, April 10, 1920 (H. G. Dyar).
NEVADA: Reno, July 19, 1915 (H. G. Dyar).
OREGON: Klamath Falls, (Dyar and Caudell).
CALIFORNIA: Eureka, (A. N. Caudell).
Los Angeles, (D. W. Coquillett).
San José, May 13, 1906 (———).
ARIZONA: Williams, May 25 (H. S. Barber).
NEW MEXICO: Santa Fé, July (T. D. A. Cockerell).
COLORADO: Boulder, September (T. D. A. Cockerell).

Genus MANSONIA Blanchard.[8]

Taeniorhynchus LYNCH ARRIBALZAGA (part, misidentified), Rev. Mus. de La Plata, vol. 1, p. 374, 1891.
Panoplites THEOBALD (not Gould), Mon. Culic., vol. 2, p. 173, 1901.
Mansonia BLANCHARD, C. R. Soc. de Biol., vol. 53, p. 1045, 1901.
Coquillettidia DYAR, Proc. Ent. Soc. Wash., vol. 7, p. 45, 1905.
Mansonioides THEOBALD, Mon. Culic., vol. 4, p. 498, 1907.
Rhynchotaenia BRÈTHES, Anal. Mus. Nac. B. A., ser. 3, vol. 13, p. 470, 1911.
Pseudotaeniorhynchus THEOBALD, Nov. Cul., vol. 1, p. 19, 1911.

A small genus of general distribution, the species more numerous in the Tropics. The larvae are peculiar in having the air tube adapted for piercing the vascular roots of certain aquatic plants, from which they get their supply of air. The eggs are deposited in rafts in swamps where suitable plants grow, and the young larvae descend to the roots, never coming to the surface again.

The genus has been divided into subgenera on genitalic characters,[9] as follows:

[8] *Taeniorhynchus* of European authors.
[9] Dyar, Ins. Ins. Mens., vol. 6, p. 112, 1918.

1. Clasper branched; process from the angle of excavation of sidepiece long, swollen at tip, with short inserted rod------Subgenus **Mansonia** Blanchard.
Clasper simple; process short, at least shorter than the rod, not swollen at tip. Subgenus **Coquillettidia** Dyar.

KEY TO THE UNITED STATES SPECIES OF MANSONIA.

1. Hind tibia with a white ring beyond the middle----------**perturbans** Walker.
Hind tibia without a white ring----------**titillans** Walker.

Subgenus COQUILLETTIDIA Dyar.

MANSONIA (COQUILLETTIDIA) PERTURBANS Walker.

Culex perturbans WALKER, Ins. Saund., Dipt., p. 428, 1856.
Culex ochropus DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 100, 1907.

A rather large mosquito with scaly wings and conspicuously ringed legs. Proboscis with many pale scales in the middle, the base and tip dark. Mesonotum with rather coarse pale golden scales, imperfectly covering the surface. Abdomen brown, with a few pale scales at the bases of the segments and triangular whitish spots at the sides; venter pale scaled, with blackish ones toward the apices of the segments. Legs dark, with pale scales intermixed, the femora and tibiae pale beneath, the hind tibia with a pale ring at outer third; tarsi with broad white rings at the bases of the joints, the first joint also with a white ring in the middle. Wings with the scales dense and rather broad, brown with white ones intermixed.

The larvae are attached to the roots of a species of *Carex* growing in marshes or the edges of ponds. The winter is passed as half-grown larva. The adults fly several miles from the breeding grounds and are severe biters. They have been known to descend unused chimneys to get into dwellings which were otherwise screened.

Distribution.—North America, Florida to Canada, westward in timbered country to British Columbia.

United States Records.

MAINE: Lincolnville, August, 1908 (H. G. Dyar).
NEW HAMPSHIRE: Center Harbor, August, 1902 (H. G. Dyar).
MASSACHUSETTS: Springfield, June 7, 1903 (F. Knab).
CONNECTICUT: Brandford, June 4, 1904 (H. L. Viereck).
NEW YORK: Ithaca, July 14, 1891 (J. H. Comstock).
NEW JERSEY: Delair, July 9, 1901 (W. P. Seal).
MARYLAND: Lakeland, August 8, 1895 (F. C. Pratt).
DISTRICT OF COLUMBIA: Washington, August, 1906 (T. Pergande).
VIRGINIA: Lake Drummond, June 11, 1905 (H. S. Barber).
NORTH CAROLINA: Plymouth, June 8, 1910 (N. C. Dept. Agriculture).
GEORGIA: Myrtle, May 19, 1906 (A. A. Girault).
FLORIDA: Lake Okeechobee, March, 1906 (J. H. Egbert).
LOUISIANA: New Orleans, May 2, 1901 (H. A. Veazie).
ARKANSAS: Little Rock, July 11, 1904 (H. S. Barber).
MISSOURI: St. Louis, August, 1904 (A. Busck).

IOWA: Ames, June 27, 1906 (H. J. Quayle).
WISCONSIN: Saxeville, July 2, 1909 (B. K. Miller).
OHIO: Toledo, July 6, 1915 (C. Fox).
INDIANA: Lake Maxinkuckee (W. B. Evermann).
MONTANA: Big Fork, July 25, 1903 (E. Ricker).

Subgenus MANSONIA Blanchard.

MANSONIA (MANSONIA) TITILLANS Walker.

Culex titillans WALKER, Cat. Brit. Mus., Dipt., vol. 7, p. 5, 1848.

A medium-sized dark-brown mosquito. Mesonotum with sparse golden scales, the integument showing, giving a frosty appearance. Abdomen black above, with scattered white scales, the basal segment yellowish; venter yellowish gray. Wing scales broad and dense, black and yellowish, peppered. Legs blackish brown, with scattered light scales on femora and tibiae, the tarsi with white rings at the bases of the joints, moderately broad on the hind legs. The proboscis has a small while ring beyond the middle. The palpi in the female are nearly half as long as the proboscis. In the male they exceed it by about the length of the last joint.

The larvae are attached to the roots of a floating water plant known as "water hyacinth" or *Pistia*. These plants occur in great profusion in lakes or still rivers, and the mosquitoes may become very abundant in such places. They are said to be fierce in attack, and the bites painful.

Distribution.—Tropical America from Brazil to Mexico, the Antilles, the Everglades of Florida.

United States Records.

FLORIDA: Lake Okeechobee, March, 1906 (J. H. Egbert).

Genus PSOROPHORA Robineau-Desvoidy.

Psorophora ROBINEAU-DESVOIDY, Mem. Soc. Hist. Nat. Paris, vol. 3, p. 412, 1827.
Janthinosoma LYNCH ARRIBALZAGA, Rev. Mus. de La Plata, vol. 1, p. 374, 1891.
Grabhamia THEOBALD, Mon. Culic., vol. 3, p. 243, 1903.
Conchyliastes HOWARD, Mosq., p. 155, 1901.
Feltidia DYAR, Proc. Ent. Soc. Wash., vol. 7, p. 45, 1905.
Ceratoeystia DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 178, 1906.
Lepidosia COQUILLET, Science, n. s., vol. 23, p. 314, 1906.

A genus of tropical American origin, developed as an extreme specialization of the *Aëdes* type. The species are large and showy. The larvae develop in transient rain pools with great rapidity, from egg to adult in four or five days under favorable conditions. The eggs are spinose to withstand desiccation, and remain on the dry ground for long periods awaiting rain. How long the eggs may lie

and remain living is not known, but periods of three or four years seem certain.

A number of the species have predaceous larvae, feeding exclusively upon other mosquito larvae that are in the pools with them. Most of these are naturally other *Psorophora*, but some of the rapidly developing *Aëdes* also fall victims.

The genus has been subdivided on the characters of the male genitalia. In addition to these we will use the claws of the female, as follows:

1. Claws of the female simple——Subgenus **Grabhamia** Theobald.
   Claws of the female toothed—— 2.
2. Male claspette with setae evenly over the bulbous tip.
   Subgenus **Psorophora** Robineau-Desvoidy.
   Male claspette with all the setae on the inner aspect, in one species soldered to the side piece——Subgenus **Janthinosoma** Lynch Arribalzaga.

KEY TO THE UNITED STATES SPECIES OF PSOROPHORA.

1. Claws of the female toothed—— 2.
   Claws of the female simple—— 8.
2. Mesonotum with smooth nude areas—— 3.
   Mesonotum entirely scaled—— 5.
3. Mesonotum with median stripe of golden scales—— 4.
   Mesonotum without such stripe——**howardii** Coquillett.
4. Legs with many outstanding scales——**ciliata** Fabricius.
   Legs smooth, without outstanding scales——**ctites** Dyar.
5. Hind legs with raised, outstanding scales—— 6.
   Hind legs smooth, without outstanding scales—— 7.
6. Thorax without median dark stripe——**sayi** Dyar and Knab.
   Thorax with median dark stripe——**horridus** Dyar and Knab.
7. Penultimate joint of hind tarsi white——**discrucians** Walker.
   Tarsi without white——**cyanescens** Coquillett.
8. Yellowish species with spotted wings—— 9.
   Blackish species with peppered wings—— 10.
9. Costa pale with two black spots beyond the middle——**signipennis** Coquillett.
   Wing not so marked——**discolor** Coquillett.
10. First hind tarsal joint with a middle white ring——**columbiae** Dyar and Knab.
    This joint without a white ring——**pygmaea** Theobald.

Subgenus PSOROPHORA Robineau-Desvoidy.

PSOROPHORA (PSOROPHORA) CILIATA Fabricius.

Culex ciliata FABRICIUS, Ent. Syst., vol. 4, p. 401, 1794.
Culex molestus WIEDEMANN, Dipt. Exot., p. 7, 1821.
Culex rubidus ROBINEAU-DESVOIDY, Mem. Soc. Nat. Hist. Paris, vol. 3, p. 404, 1827.
Psorophora boscii ROBINEAU-DESVOIDY, Mem. Soc. Nat. Hist. Paris, vol. 3, p. 413, 1827.
Culex conterrens WALKER, Ins. Saund., Dipt., p. 427, 1856.

A very large mosquito, with dusky wings and shaggy, white-ringed legs. Scales on palpi and base of proboscis mostly shaggy and erect,

dark. Mesonotum with smooth nude areas, a line of golden scales in the middle, and large patch of silvery gray ones on the shoulders. Abdomen brown scaled, with scattering white ones especially toward the tips of the segments. Legs with the yellow integument showing in many places; black erect scales at ends of femora, all of tibiae and apices of tarsal joints, the tarsi, especially the hind pair, broadly white ringed at the bases. Wings with narrow brown scales, mixed with some whitish ones along the costa.

The larvae live in temporary rain puddles, and are predaceous upon the larvae of other mosquitoes with the same habit, either *Psorophora* (subgenus *Grabhamia*) or *Aëdes*. The period of larval life is very short. The winter is passed in the egg state, the eggs being spinose and adapted to withstanding desiccation. The adult is a severe biter; but may be classed otherwise as a beneficial insect, since its larva destroys many other mosquito larvae.

Distribution.—Northern Mexico to the eastern United States east of the plains to northern New York.

United States Records.

MASSACHUSETTS: Springfield, September 20, 1903 (F. Knab).
CONNECTICUT: Suffield, August 24, 1874 (G. Dimmock).
NEW YORK: Valcour Island, Lake Champlain (G. H. Hudson).
NEW JERSEY: Delair, September 27, 1900 (W. P. Seal).
MARYLAND: Baltimore, July, 1899 (D. C. Clark).
DISTRICT OF COLUMBIA: Washington, July 28, 1906 (H. S. Barber).
VIRGINIA: Grassymead, June 20, 1904 (H. G. Dyar).
WEST VIRGINIA: Kanawha Station, July 20, 1907 (A. D. Hopkins).
NORTH CAROLINA: Sullivan Island, August 31, 1903 (W. H. Parker).
SOUTH CAROLINA: McClellanville, October 12, 1906 (____).
GEORGIA: Savannah, September 1, 1920 (V. H. Bassett).
FLORIDA: Key West, August, 1901 (A. Busck).
Miami, November 1, 1921 (G. F. Moznette).
MISSISSIPPI: Agricultural College, July 10, 1902 (G. W. Herrick).
LOUISIANA: Johnson's Bayou, July 26, 1906 (J. D. Mitchell).
ARKANSAS: Deckerville, October 5, 1900 (W. B. Burns).
TEXAS: Brownsville, May 26, 1904 (H. S. Barber).
INDIAN TERRITORY: Wister, July 5, 1904 (H. S. Barber).
KANSAS: Manhattan, August 24, 1906 (R. E. Eastman).
NEBRASKA: Lincoln, August (L. Bruner).
IOWA: Burlington (P. Bartsch).
MICHIGAN: Agricultural College, September 8, 1896 (R. H. Pettit).
INDIANA: Winona Lake (E. B. Williamson).

PSOROPHORA (PSOROPHORA) CTITES Dyar.

Psorophora ctites DYAR, Ins. Ins. Mens., vol. 6, p. 126, 1918.

A very large mosquito with dusky wings and white-ringed legs, differing only from *ciliata* in lacking the raised scales on the legs

and palpi. These parts are smooth, with ordinary vestiture; but the coloration throughout is as in *ciliata.*

The larvae and life habits are unknown. It may be an aberration of *ciliata* or a distinct species.

Distribution.—Southern States.

United States Records.

TEXAS: Brownsville, August 28, 1916 (M. M. High).
GEORGIA: Augusta, July 23, 1921 (S. F. Hildebrand).

PSOROPHORA (PSOROPHORA) HOWARDII Coquillett.

Psorophora howardii COQUILLETT, Can. Ent., vol. 3, p. 258, 1901.
Psorophora virescens DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 133, 1906.

A large brilliant blue or green mosquito. Mesonotum with smooth nude areas, a band of grayish white scales on the sides. Abdomen blue dorsally, the last two segments green in the female, venter blackish scaled. Wings smoky. Legs dull yellowish, the ends of the tibiae with somewhat raised black scales, the tarsi black, with narrow white rings at the bases of the first two joints.

The larvae are predaceous on other mosquito larvae occurring in ground puddles, generally *Aëdes*, *A. infirmatus* being a common victim. They seem to prefer shaded pools, where the other *Psorophora* are less common.

Distribution.—Central America, Mexico, and southern United States, Cuba.

United States Records.

MARYLAND: Piney Point, June 25, 1900 (T. Pergande).
DISTRICT OF COLUMBIA: Chain Bridge, August 2, 1908 (T. Pergande).
NORTH CAROLINA: Charlotte, June 16, 1916 (H. P. Barret).
SOUTH CAROLINA: Hartsville, July 23, 1901 (C. Coker).
FLORIDA: Miami, September 22, 1921 (G. F. Moznette).
Tampa, March 18, 1905 (H. G. Dyar).
MISSISSIPPI: Sibley (A. Fleming).
ARKANSAS: Scott (J. K. Thibault).

Subgenus JANTHINOSOMA Lynch Arribalzaga.

PSOROPHORA (JANTHINOSOMA) SAYI Dyar and Knab.

Culex musicus SAY (not Leach), Journ. Acad. Nat. Sci. Phila., vol. 6, p. 149, 1827.
Culex posticatus COQUILLETT (not Wiedemann), U. S. Dept. Agr., Div. Ent., Circl. 40, ser. 2, p. 6, 1900.
Janthinosoma discrucians GILES (not Walker), Gnats or Mosq., ed. 2, p. 339. 1902.
Janthinosoma mexicanum BLANCHARD (not Bellardi), Les Moust., p. 234. 1905.

Janthinosoma sayi DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 181, 1906.

Janthinosoma sayi THEOBALD, Mon. Culic., vol. 4, p. 155, 1907.

A large brown mosquito, the hind legs shortly shaggy and tipped with white. Palpi, legs, and abdomen black with blue reflections. Head with dense erect golden scales; mesonotum with sparse golden scales; abdomen blue-black dorsally, with lateral triangular apical segmental yellow patches, confluent with the golden yellow venter; legs blue-black, the vestiture of the hind pair shortly erect, tip of third tarsal and all of the fourth and fifth white. Wings slightly smoky, the scales narrow, all dark.

The larvae live in temporary rain puddles, and develop rapidly. The period of larval life is very short. The winter is passed in the egg state, the eggs being spinose and adapted to withstand desiccation. The adult is generally rare, but conspicuous when seen. It will bite in daytime in the open, but is never numerous enough to be troublesome.

Distribution.—Atlantic and Gulf States to southern Ontario, Cuba, and Bahamas. This is a northern subspecies of *Psorophora posticatus* Wiedemann of tropical America.

United States Records.

MASSACHUSETTS: Springfield, July 16, 1903 (F. Knab).
DISTRICT OF COLUMBIA: Washington, September 9, 1901 (W. E. Hinds).
VIRGINIA: Glencarlyn, July 23, 1901 (N. Banks).
Luray, September 2, 1906 (F. Knab).
NORTH CAROLINA: Greensboro, August 8, 1901 (F. C. Pratt).
SOUTH CAROLINA: Columbia, August 1, 1906 (———).
GEORGIA: Brunswick, May 21, 1915 (R. H. Von Ezdorf).
FLORIDA: West Tampa, March 18, 1905 (H. G. Dyar).
MISSISSIPPI: Agricultural College, May 18, 1901 (G. W. Herrick).
LOUISIANA: Mound, June 12, 1915 (S. L. Walker).
TENNESSEE: Athens, August, 1904 (H. S. Barber).
KENTUCKY: Corbin, August 24, 1904 (H. S. Barber).
MISSOURI: Charleston, June 14, 1918 (K. C. Sullivan).
ARKANSAS: Helena, July 30, 1904 (H. S. Barber).
TEXAS: Dallas, August 31, 1906 (F. C. Pratt).
WISCONSIN: Saxeville, July 29, 1909 (B. K. Miller).
IOWA: Algonquin (H. J. Quayle).

PSOROPHORA (JANTHINOSOMA) HORRIDUS Dyar and Knab.

Aëdes horridus DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 35, p. 56, 1908.

A large black mosquito, with shaggy blue-black legs, the last two hind tarsal joints white. Thorax black scaled in the middle, the sides broadly yellowish white scaled; head yellowish white scaled. Abdomen blue-black, with apical segmental lateral yellowish spots;

venter pale yellow. Legs blue-black, the femora yellowish toward base and beneath, the scales on the tibiae and basal tarsal joints of the hind legs raised, the last two joints snowy white. Wings smoky, with narrow dark scales.

The larvae doubtless live in temporary ground pools, but unfortunately have not come under observation.

Distribution.—Southern United States. This is doubtless to be considered as a northern race of the tropical American *Psorophora lutzii* Theobald.

United States Records.

MARYLAND: Plummer Island, July 18, 1904 (R. P. Currie).
DISTRICT OF COLUMBIA: Washington, July 21, 1909 (T. Pergande).
VIRGINIA: Woodstock, August 4, 1904 (F. C. Pratt).
TEXAS: Dallas, June 24, 1904 (H. S. Barber).
Brownsville, August 29, 1916 (M. M. High).
MISSISSIPPI: Westpoint, August 11, 1904 (H. S. Barber).
ARKANSAS: Vanburen, July 6, 1904 (H. S. Barber).
TENNESSEE: Chattanooga, July 27, 1904 (H. S. Barber).
MISSOURI: Charleston, June 13, 1918 (K. C. Sullivan).
INDIAN TERRITORY: Wister, July 2, 1904 (H. S. Barber).

We have no records of this species from the southern Atlantic States, though it occurs in the Potomac watershed.

PSOROPHORA (JANTHINOSOMA) DISCRUCIANS Walker.

Culex discrucians WALKER, Ins. Saund., p. 430, 1856.
Janthinosoma arribalzagae GILES, Gnats, and Mosq., ed. 2, p. 339, 1902.
Conchyliastes varipes COQUILLETT, Can. Ent. vol. 36, p. 10, 1904.

A medium-sized blackish mosquito, bluish and silvery marked, a white ring before the tip of the hind legs. Mesonotum black scaled in the middle, yellowish silvery on the sides; head yellowish white scaled. Abdomen blue-black, with lateral whitish patches, apically situated on the segments, but running well toward their bases; venter yellowish, with broad black bands at the apices of the segments. Legs black-scaled, smooth, femora yellowish at base and beneath, the hind tarsi with the fourth joint white, the fifth black. Wings smoky, scales dark.

The larvae occur in ground pools. A specimen was bred from a cacao husk. The life history is very imperfectly known.

Distribution.—Mississippi Valley, Mexico, and Central America, absent in the central Tropics, reappearing in southern Brazil and Argentina. It is possible that the northern form should be separated under the name *Psorophora varipes* Coquillett; but there is not sufficient material before us to make the necessary comparisons of all stages.

United States Records.[10]

MISSISSIPPI: Clarksdale, August 1, 1904 (H. S. Barber).
LOUISIANA: Mound, May 29, 1915 (A. H. Jennings).
ARKANSAS: Scott, September 1, 1908 (J. K. Thibault).
INDIAN TERRITORY: Wister, July 7, 1904 (H. S. Barber).
MISSOURI: Charleston, June 11, 1918 (K. C. Sullivan).

PSOROPHORA (JANTHINOSOMA) CYANESCENS Coquillett.

Culex cyanescens COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 137, 1902.

A large blue-black mosquito with reddish yellow femora. Head and mesonotum sparsely scaled with yellowish, the black integument showing; abdomen blue-black, with apical segmental pale golden bands; venter pale golden scaled, the terminal segments black in the middle. Legs blue-black, smoothly scaled, the femora rather conspicuously reddish yellow. Wings smoky, the veins dark scaled.

The larvae develop rapidly in temporary rain puddles. Mr. J. K. Thibault says:

> The appearance of this mosquito immediately after rains is so strikingly characteristic that even people who never pay much attention to such things notice it. They are out in force for several days after a rain and then only a few will be found till the next rain.

It does not enter houses, but is very persistent out of doors, even in bright sunlight, and will often pursue a person. It is said never to voluntarily quit biting, but must be brushed off. Specimens have been seen on a horse for hours, voiding the surplus blood and sucking fresh.

Distribution.—Gulf States and Mexican coastal region to Yucatan; also in Colombia.

United States Records.

KANSAS: Wellington, May, 1908 (E. O. G. Kelly).
ARKANSAS: Fort Smith, July 8, 1904 (H. S. Barber).
LOUISIANA: Shreveport, June 23, 1905 (H. A. Morgan).
MISSISSIPPI: Sibley, July 9, 1921 (A. Fleming).
TEXAS: Paris, June 17, 1907 (F. C. Bishopp).
Brownsville, August 30, 1916 (M. M. High).

Subgenus GRABHAMIA Theobald.

PSOROPHORA (GRABHANIA) SIGNIPENNIS Coquillett.

Taeniorhynchus signipennis COQUILLETT, Proc. Ent. Soc. Wash., vol. 6, p. 167, 1904.

A medium-sized yellowish mosquito with spotted wings. Mesonotal integument blackish, with fine brassy scales, with irregular

[10] The specimen recorded from Georgia in the monograph is not in the collection. It was probably misidentified and afterwards removed.

mottled reflection. Abdomen blackish, with whitish scales over most of the surface, leaving oblique paired lines on each segment; venter peppered black and whitish. Legs blackish, densely peppered, the femora with a pale ring before tip. Tarsi with broad white rings at the bases of the joints, the first hind tarsal also broadly white in the middle, leaving only a black ring near base and at tip. Wing scales black and whitish, three black marks on the costal edge, the first at middle, the last apical; a spot on the sixth vein; fringe conspicuously spotted. Proboscis broadly whitish in the middle.

The larvae develop rapidly in temporary rain pools in arid country. The adults bite much as the other prairie species, by day as well as evening, in the open. The males swarm after sunset over the prairie.

Distribution.—Arid valleys west of the Mississippi from northern Mexico to Montana.

United States Records.

MONTANA: Glasgow, July 11, 1921 (H. G. Dyar).
Poplar, July 20, 1921 (H. G. Dyar).
Laurel, July 16, 1917 (H. G. Dyar).
TEXAS: Camp McAllen, August 28, 1921 (Army Medical Museum).
San Antonio (Army Medical Museum).
Austin, August 10, 1908 (A. W. Morrill).
Laredo (T. D. Berry).
NEW MEXICO: Mesilla, October 4, 1893 (T. D. A. Cockerell).
ARIZONA: Willcox, July 31, 1909 (A. K. Fisher).

PSOROPHORA (GRABHAMIA) DISCOLOR Coquillett.

Culex discolor COQUILLETT, Can. Ent., vol. 35, p. 256, 1903.

A medium-sized light-brown mosquito with mottled wings. Mesonotal integument blackish, covered with fine pale golden scales, not obscuring the integument. Abdomen peppered, with apical pale bands, forming a median pale line. Wings with the costa dark, a pale mark at outer third, but not spotted; wing scales dark and pale, dense in spots, forming mottlings, especially at base of third vein, forks of second and fourth, a line on upper fork of fifth. Legs peppered, femora with a pale ring before apex; tarsi with white rings at the bases of the joints, the hind tibia also broadly whitish in the middle. Proboscis with broad whitish ring.

This species is much like *signipennis*, but the wings do not have the conspicuous costal spots. The larvae live in temporary rain puddles, but not in the arid regions, preferring a more abundant rainfall. The larvae are peculiar, for whereas all the other *Psorophora* larvae, with the exception of the predaceous species, have greatly enlarged air tubes, this one has a small air tube, but greatly enlarged antennae. We have no observations on the biting habits.

Distribution.—Southern States to Mexico.

United States Records.

NEW JERSEY: Delair, June 28 (W. P. Seal).
DISTRICT OF COLUMBIA: Washington, September 9, 1901 (J. Kotinsky).
VIRGINIA: Grassymead, May 24 (H. G. Dyar).
NORTH CAROLINA: Charlotte, May 5, 1915 (H. P. Barret).
MISSISSIPPI: Clarksdale, July 31, 1904 (H. S. Barber).
LOUISIANA: Baton Rogue (J. W. Dupree).
TEXAS: Plano, May (E. S. Tucker).
Brownsville, August 30, 1916 (M. M. High).

PSOROPHORA (GRABHAMIA) COLUMBIAE Dyar and Knab.

Janthinosoma texanum DYAR AND KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 135, 1906.
Janthinosoma columbiae DYAR AND KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 135, 1906.
Janthinosoma columbiae DYAR AND KNAR, Proc. Biol. Soc. Wash., vol. 19, p. 135, 1906.

A rather large blackish mosquito. Mesonotum with brown or bluish scales, more or less frosted, with irregular reflection, sometimes forming paired spots. Abdomen black, with paired oblique whitish powdery spots at the apices of the segments, spreading and diffuse posteriorly. Legs black, the femora with white rings before the apex; tibiae spotted with white on the outside; tarsi with white rings at the bases of the joints, the first joint also with a whitish ring in the middle. Wing scales black, peppered with white, forming a black spot at the base of the third vein. Proboscis with a whitish ring in the middle.

The larvae occur in ground pools filled with rain water, and develop rapidly. The adults are not very troublesome, although they are said to bite, but without leaving a severe irritation.

A number of names were applied to this species, which was also considered identical with *Psorophora jamaicensis* Theobald of the Antilles. The present arrangement on the basis of the male genitalia may be found discussed by Dyar.[11]

Distribution.—Cuba, the Bahamas, Florida, and Texas northward.

United States Records.

NEW YORK: Cold Spring Harbor, July 17, 1901 (F. E. Lutz).
NEW JERSEY: Delair, July 10, 1901 (W. P. Seal).
MARYLAND: Hyattsville, August, 1906 (A. Busck).
DISTRICT OF COLUMBIA: Washington, (W. V. Warner).
VIRGINIA: Woodstock, June 6, 1900 (F. C. Pratt).
WEST VIRGINIA: Kanawha Station, July 20, 1907 (A. D. Hopkins).
GEORGIA: Atlanta, July 4, 1906 (W. B. Summerall).
NORTH CAROLINA: Greensboro, August, 1901 (F. C. Pratt).

[11] Ins. Ins. Mens., vol. 8, p. 140, 1920.

FLORIDA: Jacksonville, July 2, 1906 (H. Byrd).
Kissimmee, March 19, 1905 (H. G. Dyar).
Miami, October 29, 1921 (G. F. Moznette).
MISSISSIPPI: Tutweiler, August 2, 1904 (H. S. Barber).
LOUISIANA: New Orleans, January 7, 1904 (S. G. Gill).
TEXAS: Llano Grandee, September, 1916 (R. S. Cleaner).
San Antonio (Army Medical Museum).
Brownsville, August 29, 1916 (M. M. High).
ILLINOIS: Carbondale, May 27, 1918 (S. C. Chandler).
MISSOURI: Sikeston, September 8, 1921 (M. F. Boyd).
KENTUCKY: Corbin, August 24, 1904 (H. S. Barber).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
ARKANSAS: Little Rock, July 11, 1904 (H. S. Barber).

PSOROPHORA (GRABHAMIA) PYGMAEA Theobald.

Grabhamia pygmaea THEOBALD, Mon. Culic., vol. 3, p. 245, 1903.
Culex nanus COQUILLETT, Can. Ent., vol. 35, p. 256, 1903.
Taeniorhynchus antiguae GILES, Journ. Trop. Med., vol. 7, p. 362, 1904.

A rather small blackish mosquito. Mesnotal integument blackish, vestiture gray, frosted, with irregular reflection, appearing spotted. Abdomen black, with broad apical segmental whitish bands, produced in the middle; venter light gray. Legs blackish, the femora with small pale ring before apex; tarsi with small white rings at the bases of the joints, the first joint not different from the others. Wing scales black and white, evenly peppered. A whitish ring on the proboscis.

The larvae occur in temporary ground pools. We have no observations on the biting habits. The species much resemble *columbiae;* but is smaller and less brightly colored.

Distribution.—Antilles, Bahamas, and Florida Keys.

United States Records.

FLORIDA: Key West, April 1, 1903 (E. A. Schwarz).

Genus AEDES Meigen.

Aëdes MEIGEN, Syst. Beschr. Bek. Eur. Zweifl. Ins., vol. 1, p. 13, 1818.
Heteronycha LYNCH ARRIBALZAGA, Rev. Mus. de la Plata, vol. 1, p. 373, 1891.
Ochlerotatus LYNCH ARRIBALZAGA, Rev. Mus. de la Plata, vol. 1, p. 374, 1891.
Taeniorhynchus LYNCH ARRIBALZAGA, Rev. Mus. de la Plata, vol. 1, p. 374, 1891.
Stegomyia THEOBALD, Journ. Trop. Med., vol. 4, p. 159, 1901
Gilesia THEOBALD, Mon Culic., vol. 3, p. 233, 1903.
Acartomyia THEOBALD, Mon. Culic., vol. 3, p. 251, 1903.
Finlaya THEOBALD, Mon. Culic., vol. 3, p. 281, 1903.
Howardina THEOBALD, Mon. Culic. vol. 3, p. 287, 1903.
Aedimorphus THEOBALD, Mon. Culic., vol. 3, p. 290, 1903.
Skusea THEOBALD, Mon. Culic., vol. 3, p. 291, 1903.

Verrallina THEOBALD, Mon. Culic., vol. 3, p. 295, 1903.
Macleaya THEOBALD, Entom., vol. 36, p. 154, 1903.
Catageiomyia THEOBALD, Thomps. Yates & Johnst. Lab. Repts., vol. 5, pt. 2, p. i, 1903.
Culicelsa FELT, Bull. 79, N. Y. Sta. Mus., p. 391*b*, 1904.
Culicada FELT, Bull. 79, N. Y. Sta. Mus., p. 391*b*, 1904.
Ecculex FELT, Bull. 79, N. Y. Sta. Mus., p. 391*c*, 1904.
Protoculex FELT, Bull. 79, N. Y. Sta. Mus., p. 391*d*, 1904.
Scutomyia THEOBALD, Entom., vol. 37, p. 77, 1904.
Danielsia THEOBALD, Entom., vol. 37, p. 78, 1904.
Hulecoetomyia THEOBALD, Entom., vol. 37, p. 163, 1904.
Pseudoculex DYAR, Proc. Ent. Soc. Wash., vol. 7, p. 45, 1905.
Gualteria LUTZ, Imprensa Med., p. 65, 1905.
Phagomyia THEOBALD, Gen. Ins., Dipt., 26 fasc., p. 14. 1905.
Polyleptiomyia THEOBALD, Gen. Ins., Dipt., 26 fasc., p. 15, 1905.
Lepidotomyia THEOBALD, Gens. Ins., Dipt., 26 fasc., p. 15, 1905.
Reedomyia LUDLOW, Can. Ent., vol. 37, p. 94, 1905.
Pecomyia THEOBALD, Journ. Econ. Biol., vol. 1, p. 23, 1905.
Pseudograbhamia THEOBALD, Journ. Bombay Nat. Hist., vol. 16, p. 243, 1905.
Chrysoconops GOELDI, Os Mosq. no Para, p. 114, 1905.
Gymnometopa COQUILLETT, Proc. Ent. Wash., vol. 7, p. 183, 1905.
Lepidoplatys COQUILLETT, Science, n. s., vol. 23, p. 134, 1906.
Quasistegomyia THEOBALD, 2d Rep. Wellc. Res. Lab., p. 69, 1906.
Duttonia NEWSTEAD, Ann. Trop. Med. & Par., vol. 1, p. 17, 1907.
Pseudoskusea THEOBALD, Mon. Culic., vol. 4, p. 192, 1907.
Pseudohowardina THEOBALD, Mon Culic., vol. 4, p. 223, 1907.
Neomacleaya THEOBALD, Mon. Culic., vol. 4, p. 228, 1907.
Protomacleaya THEOBALD, Mon. Culic., vol. 4, p. 253, 1907.
Banksinella THEOBALD, Mon. Culic., vol. 4, p. 468, 1907.
Mimeteculex THEOBALD, 3d Rep. Wellc. Res. Lab., p. 258, 1908.
Geitomyia LEICESTER, Stud. Ins. Med. Res., Fed. Mal. Sta., vol. 3, pt. 3, p. 134, 1908.
Aioretomyia LEICESTER, Stud. Ins. Med. Res., Fed. Mal. Sta., vol. 3, pt. 3, p. 185, 1908.
Kingia THEOBALD, Mon. Culic., vol. 5, p. 135, 1910.
Myxosquamus THEOBALD, Mon. Culic., vol. 5. p. 225, 1910.
Nepecomyia THEOBALD, Mon. Culic., vol. 5, p. 261, 1910.
Stenoscutus THEOBALD, Mon. Culic., vol. 5, p. 263, 1910.
Bathosomyia THEOBALD, Mon. Culic., vol. 5, p. 135, 1910.
Molpemyia THEOBALD, Mon. Culic., vol. 5, p. 479, 1910.
Leslieomyia CHRISTOPHERS, Paludism, No. 2, p. 68, 1911.
Andersonia STRICKLAND, Entom., vol. 44, p. 250, 1911.

A large genus of world-wide distribution, varying greatly in habit, in general addicted to temporary water. The lower members of the group occur in water in containers, tree holes, etc., and one of these has become domestic and is the well-known vector of yellow fever. Other species of *Aëdes* of this subgenus (*Stegomyia*) are said to transmit dengue and filariosis. The higher members of the genus frequent ground pools. A large section of the genus is restricted to the northern and Arctic regions, the larvae developing in the snow water of

spring. These species are often abundant and annoying, but none of them are known to convey diseases of man.

The genus has been divided into a number of subgenera on the characters of the male genitalia. The groups occurring in the United States may be separated as follows:

1. Claspette present ---------- 2.
   Claspette absent ---------- 3.
2. Sidepiece with apical and basal lobes ---------- Subgenus **Heteronycha** Lynch Arribalzaga.
   Sidepiece with basal lobe, no apical one ---------- Subgenus **Taeniorhynchus** Lynch Arribalzaga.
   Sidepiece without lobes ---------- Subgenus **Finlaya** Theobald.
3. A hairy or spinose lobe at base of sidepiece ---------- 4.
   Without this structure; basal membrane expanded or modified ---------- Subgenus **Stegomyia** Theobald.
4. Lobe at base of sidepiece complex; clasper modified, furcate and with a basal branch ---------- Subgenus **Aëdes** Meigen.
   This lobe simple; clasper without basal branch, though sometimes modified at apex ---------- Subgenus **Ecculex** Felt.

KEY TO THE UNITED STATES SPECIES OF AËDES.

1. Tarsi with white rings on both ends of the joints ---------- 2.
   Tarsi with white rings basally on the joints ---------- 6.
   Tarsi without white rings ---------- 16.
2. Wing scales markedly bicolored ---------- 3.
   Wing scales uniformly dark, or nearly so ---------- 4.
3. Larger species; wing veins evenly mottled ---------- **campestris** Dyar and Knab.
   Smaller species; third vein darker scaled than adjoining ones. **dorsalis** Meigen.
4. Mesonotum uniformly brown, or nearly so ---------- **canadensis** Theobald.
   Mesonotum ornamented, striped or spotted ---------- 5.
5. Mesonotum pale, with broad dark median stripe ---------- **epactius** Dyar and Knab. / **atropalpus** Coquillett.
   Mesonotum pale yellowish with dark spots ---------- **varipalpus** Coquillett.
   Mesonotum pale golden before, varied with brown behind; tarsal pale rings almost wholly basal ---------- **fluviatilis** Lutz.
6. Proboscis of the female white ringed ---------- 7.
   Proboscis of the female without white ring ---------- 11.
7. Abdomen with a longitudinal dorsal pale stripe ---------- 8.
   Abdomen without a dorsal pale stripe ---------- 10.
8. Wing scales wholly dark ---------- **mitchellae** Dyar.
   Wing scales dark and light mixed ---------- 9.
9. Abdomen with sides and dorsal stripe concolorous ---------- **nigromaculis** Ludlow.
   Abdomen with white lateral spots, not concolorous with dorsal stripe. **sollicitans** Walker.
10. Last joint of hind tarsi white ---------- **taeniorhynchus** Wiedemann.
    Last joint black, white at base ---------- **portoricensis** Ludlow.
11. Mesonotum with lyre-shaped silvery marking ---------- **aegypti** Linnaeus.
    Without such markings ---------- 12.
12. Tarsal pale rings broad, especially on hind legs ---------- 13.
    Tarsal pale rings narrow; mesonotum uniformly brown ---------- 15.

13. Large yellowish species; abdomen suffused with yellow scales — flavescens Müller. / aloponotum Dyar. / riparius Dyar and Knab.

Somewhat smaller species with little yellow, the abdomen more or less concretely banded — 14.

14. Wing scales narrow, normal — excrucians Walker. / mutatus Dyar. / increpitus Dyar. / mississippii Dyar. / classicus Dyar. / stimulans Walker. / albertae Dyar. / mercurator Dyar. / fitchii Felt and Young. / mimesis Dyar. / palustris Dyar.

Wing scales broad, inflated — grossbecki Dyar and Knab. / squamiger Coquillett.

15. Terminal abdominal segments with normal pale bands — vexans Meigen.

Terminal abdominal segments largely pale scaled — cantator Coquillett.

16. Mesonotum yellow in the integument, with two black spots; scaling inconspicuous — bimaculatus Coquillett.

Mesonotum brown, normal, scaled — 17.

17. Mesonotum marked with silver — 18.

Mesonotum dark with two yellow stripes — trivittatus Coquillett.

Mesonotum otherwise marked — 19.

18. Mesonotum with a broad silvery patch before — infirmatus Dyar and Knab.

Mesonotum with broad silvery area reaching far back — dupreei Coquillett.

Mesonotum with narrow median silvery line — atlanticus Dyar and Knab. / tormentor Dyar and Knab.

Mesonotum silvery at the sides, dark brown centrally — triseriatus Say.

19. Abdomen with continuous, or nearly so, white lateral line — cinereus Meigen.

Abdomen transversely banded or unbanded, the lateral spots never joined — 20.

20. Wing scales markedly bicolored — 21.

Wing scales uniformly dark, or nearly so — 23.

21. Mesonotum brown and gray intermixed; wing veins mostly black, with white scales subcostally and in cell — niphadopsis Dyar and Knab.

Mesonotum longitudinally striped; wing veins black and white alternating — 22.

22. Abdomen with median dorsal abdominal pale stripe — spencerii Theobald.

Abdomen generally without the median stripe — idahoensis Theobald.

23. Mesonotum typically with central broad undivided dark band — 24.

Mesonotum with divided central dark band or none — 26.

24. Mesonotum contrastingly yellow at the sides — 25.

Mesonotum creamy yellow at the sides — aestivalis Dyar. / hirsuteron Theobald.

Mesonotum golden or reddish brown at the sides; median stripe sometimes divided or mesonotum uniformly dark brown — punctor Kirby.

Mesonotum light yellowish at the sides, with illy contrasted median brown band — prolixus Dyar.

25. Yellow lateral lines straight and narrow — aurifer Coquillett.

Yellow lines broad, narrowed posteriorly — thibaulti Dyar and Knab.

26. Mesonotum with paired brown lines---------- 27.
Mesonotum uniformly colored, without lines---------- 28.

27. Mesonotum golden yellowish, the lines very narrow, well apart; a very small species----------**gonimus** Dyar and Knab.
Mesonotum yellowish, lines usually narrow and well separated; a very small species----------**aldrichi** Dyar and Knab.
Mesonotum yellow (or gray), sometimes more or less suffused with brown centrally, the margin remaining yellow; lines narrow, sometimes obsolete; medium sized species----{**dysanor** Dyar. **lazarensis** Felt and Young.
Mesonotum yellow-brown, with two rather narrow dark lines; a small species ----------**altiusculus** Dyar.
Mesonotum gray with dark lines, usually largely overspread with brown centrally; medium sized species----------**masamae** Dyar.
Mesonotum gray with dark lines, usually little overspread with brown centrally; two white spots often on disk----------**tahoënsis** Dyar.
Mesonotum yellow (rarely gray), the dark lines broad heavy, well contrasted and passing back around the antescutellar space; a larger species. **pionips** Dyar.
Mesonotum yellow, lines slender, often conjoined into a median stripe; legs very deep black----------**diantaeus** Howard, Dyar, and Knab.
Mesonotum yellow, the side stripes darker and heavier than the median pair; a small species----------**cyclocerculus** Dyar.
Mesonotum yellow, lines moderate, normal; a medium sized species. **leuconotips** Dyar.
Mesonotum yellow to brown, variable, lines present or absent. **hexodontus** Dyar.
Mesonotum yellow to brown, lines distinct, broad, sometimes joined mesially; a large species----------**aboriginis** Dyar.
Mesonotum gray with central brown shade; lines fine, dark; a small species. **impiger** Walker.
Mesonotum mossy yellow; lines narrow and very approximate. **pullatus** Coquillett.
Mesonotum very light yellow, lines broad, black----------**iridipennis** Dyar.

28. Thorax with long hairs, especially below---------- ----{**alpinus** Linnaeus. **nearcticus** Dyar.
Thorax with normal setae in the female---------- 29.

29. Mesonotum light gray, with traces of dark lines, or a central brown shade, sometimes covering the whole mesonotum; a small species. **cataphylla** Dyar.
Mesonotum dark gray, often with whitish shades at each side; a large species-----{**trichurus** Dyar. **cineroborealis** Felt and Young.
Mesonotum uniformly dark brown; a medium sized species, very fond of entering houses----------**intrudens** Dyar.
Mesonotum with illy contrasted dark lines or uniformly brown; an arctic species from the coast of Alaska----------**punctodes** Dyar.
Mesonotum uniformly dark brown; venter with longitudinal black stripe. **fisheri** Dyar.
Mesonotum uniformly golden brown; abdomen spotted----------**thelcter** Dyar.
Mesonotum olivaceous brown, darker shaded centrally, sometimes with diffused paired brown lines----------**ventrovittis** Dyar.

As indicated above, the variation in color of the mesonotum is considerable, so that the characters overlap on all sides, and specimens occur which cannot be correctly placed with any table. The male genitalia are necessary for determination in such cases, especially in the subgenus *Heteronycha*, where the confusion due to this variability is likely to be greatest.

KEY TO THE UNITED STATES SPECIES OF HETERONYCHA BY THE MALE GENITALIA.

1. Basal lobes modified, obsolete as such, but leaving a large spine on one side and two approximate setae on the other, the latter sometimes obsolete. (Group **Pullatus**) 2.
   Basal lobes more or less developed ..... 4.
2. Basal lobe large with two stout spines ..... 3.
   Basal lobe small, with two stout spines ..... **pullatus** Coquillett.
   Basal lobe absent, no basal spines ..... **aurifer** Coquillett.
3. A slight hairy area distal of apical lobe ..... **intrudens** Dyar.
   A strong hairy area proximal of apical lobe. **diantaeus** Howard, Dyar, and Knab.
4. Basal lobe elongate, semidetached, the setiferous part separate from the spine ..... (Group **Serratus**) 5.
   Basal lobe sessile, the setae not apart from the spine, or spine wanting .. 8.
5. Basal lobe of side piece rounded and bulbous ..... 6.
   This lobe elongated, finger shaped ..... 7.
6. Filament of claspette broadly bladeshaped ..... **bimaculatus** Coquillett.
   Filament of claspette slender ..... **dupreei** Coquillett.
7. Stem of claspette thick, sinuous ..... **atlanticus** Dyar and Knab.
   Stem of claspette slender, less sinuous ..... **tormentor** Dyar and Knab.
8. Basal lobe more or less expanded and tubercular, with or without a spine ..... 9.
   Basal lobe uniformly long-haired, no spine ..... 27.
9. Basal lobe expanded, with many setae, but without a single differentiated long spine; if the marginal spines are thickened, more than one is involved ..... (Group **Dorsalis**) 10.
   Basal lobe with a single differentiated spine, or if absent, the lobe if flat and rugose ..... 11.
10. Basal lobe without spines on the margin ..... **canadensis** Theobald.
    Basal lobe with coarse spinelike setae on the margin. **campestris** Dyar and Knab.
    Basal lobe with two stout spines on the margin ..... **dorsalis** Meigen.
11. Apical lobe with short flat clinging setae ..... (Group **Punctor**) 12.
    Apical lobe with the setae normal or slightly thickened ..... 13.
12. Spine of basal lobe a normal spine 13
    This spine greatly thickened and delicate ..... **spencerii** Theobald. **idahoensis** Theobald. **hirsuteron** Theobald. **aestivalis** Dyar. **aldrichi** Dyar and Knab.
13. Claspette filament long, sickle shaped ..... **dysanor** Dyar. **punctodes** Dyar.
    Claspette filament short, curved ..... 14.

14. Spine of basal lobe stout---- { hexodontus Dyar. / cyclocerculus Dyar. / leuconotips Dyar / punctor Kirby.

Spine of basal lobe slender---- aboriginis Dyar. / fisheri Dyar.

15. Setae on apical lobe more or less well developed; filament of claspette without retrose spine----16.

Setae on apical lobe practically absent; filament of claspette with retrose spine. (Group Scapularis.) { infirmatus Dyar and Knab. / trivittatus Coquillett. / thelcter Dyar.

16. Setae on apical lobe more or less distinctly outwardly directed when the lobe is retracted, not functioning as organs or prehension, tending to obsolescence----(Group Impiger) 17.

Setae on apical lobe inwardly directed, often distinctly functional, though occasionally obsolescent----(Group Stimulans) 19.

17. Apical lobe of sidepiece nearly bare---- { impiger Walker. / cataphylla Dyar. / niphadopsis Dyar and Knab.

Apical lobe of sidepiece distinctly setose----18.

18. Setae on apical lobe stouter than adjoining ones----prolixus Dyar.

These setae not stouter than adjoining ones---- { lazarensis Felt and Young. / altiusculus Dyar. / masamae Dyar. / tahoensis Dyar. / pionips Dyar.

19. Basal lobe of sidepiece without a spine or tuft of setae, flat; apical lobe with short normal setae----20.

Basal lobe with a strong distinct spine, free; accompanied by few setae; lobe flat; apical lobe with normal setae----22.

Spine of basal lobe strong or weak, accompanied by many setae; basal lobe conical; apical lobe with short, slightly thickened, somewhat curved setae----25.

20. Rugose area of basal lobe reaching up to apical lobe----excrucians Walker.

This area not reaching beyond middle of sidepiece----21.

21. Filament of claspette angularly expanded beyond middle; spines of ninth tergites longer----increpitus Dyar.

Filament of claspette angularly expanded toward base, spines of ninth tergites shorter----mutatus Dyar.

22. Basal lobe rugose nearly to apical lobe; filament of claspette angularly expanded at basal third----flavescens Müller.

Basal lobe round, not longer than broad, rugose; filament of claspette expanded at middle----23.

Basal lobe a small setiferous area next to the spine; filament of claspette thick, angularly bent in middle----cantator Coquillett.

23. Setae of apical lobe coarser than the ordinary vestiture--mississippii Dyar.

Setae of apical lobe about the same size as the vestiture----24.

Setae of apical lobe distinctly weaker than the vestiture----albertae Dyar.

Setae of apical lobe very small and short----mercurator Dyar.

24. Claspette filament long, slender and pale with an angle beyond the middle. stimulans Walker.

Claspette filament moderately long, thick and dark, roundedly swollen near the middle----classicus Dyar.

25. Filament of claspette shortly and slenderly sickle shaped, with more or less distinct basal notch----------26.
Filament of claspette with a broad expansion the whole length; basal lobe highly conical with strong spine----------riparius Dyar and Knab.
Filament of claspette short and smoothly widened; basal lobe moderate with very strong spine----------grossbecki Dyar and Knab.
Filament of claspette long, angularly widened at middle; basal lobe moderate, with strong spine----------squamiger Coquillett.

26. Spine of basal lobe fairly strong; spines of ninth tergites long.
fitchii Felt and Young.
Spine of basal lobe weaker; spines of ninth tergites long----mimesis Dyar.
Spine of basal lobe much weaker; spines of ninth tergites very long.
palustris Dyar.

27. Apical lobe with short, curved, clinging setae.
(Group **Thibaulti**) **thibaulti** Dyar and Knab.
Setae on apical lobe normal----------28.

28. Setae on apical lobe long, more or less outwardly directed.
(Group **Trichurus**) **cinereoborealis** Felt and Young.
Setae on apical lobe very short and few, inwardly directed.
(Group **Alpinus**) { **alpinus** Linnaeus. **nearcticus** Dyar.

Subgenus HETERONYCHA Lynch Arribalzaga.[12]

Group SERRATUS.

AËDES (HETERONYCHA) BIMACULATUS Coquillett.

Culex bimaculatus COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 84, 1902.

A rather large yellow mosquito. Mesonotum yellow, yellow scaled, two black spots posteriorly in the integument. Abdomen black, with broad yellow basal segmental bands, the terminal segments wholly yellow; venter yellow. Legs yellow, the femora and tibiae black at their tips; first tarsal joint yellow with black tip, the remaining joints black, the second with a little yellow at base. Wings slightly infuscated, scales dark, the costa and first vein broadly yellow nearly to apex. Proboscis yellow with black tip.

The larvae live in muddy ground puddles following rain. The form is doubtless a race of the tropically distributed *Aëdes fulvus* Wiedemann. The mosquito is of very striking coloration, but extremely rare, so that it can not be considered troublesome.

Distribution—Southern States.

United States Records.

TEXAS: Brownsville, August 30, 1916 (M. M. High).
LOUISIANA: New Orleans, September 10, 1914 (W. V. King).
ARKANSAS: Scott, September 23, 1909 (J. K. Thibault).

[12] This subgeneric name becomes *Ochlerotatus* Lynch Arribalzaga in case *Heteronycha* is referred to the synonymy of *Culex*.

MISSISSIPPI: Natchez, June 9, 1910 (A. Fleming).
NORTH CAROLINA: Charlotte, July, 1916 (H. P. Barret).

AËDES (HETERONYCHA) DUPREEI Coquillett.

Culex dupreei COQUILLETT, Can. Ent., vol. 36, p. 10, 1904.

A very small mosquito, the mesonotum broadly silvery in the middle the whole length in the female, brown at the sides, the whole mesonotum silvered in the male; head silvery scaled. Abdomen black above, with lateral segmental white spots in the female, broad basal segmental bands in the male; venter pale. Legs black, the femora white below toward base, a pale line along the underside of tibiae and tarsi. Wing scales dark.

The larvae live in ground puddles and on account of the very long tracheate anal gills are able to remain down and seldom come to the surface. The larvae are therefore difficult to collect, and as the adults are hardly ever met with, the species is rare in collections.

Distribution.—Atlantic and Gulf States, probably extending to Central America. Some of the records in the monograph[13] are in error. The specimen from Washington, District of Columbia, is *triseriatus;* that from Trinidad is *oligopistus*, thus leaving the only southern record Costa Rica, which depends upon unbred larvae, without adults.

United States Records.

NEW JERSEY: New Brunswick, August 1 (J. B. Smith).
LOUISIANA: Baton Rouge (J. W. Dupree).
ARKANSAS: Scott, July 11, 1909 (J. K. Thibault).

AËDES (HETERONYCHA) ATLANTICUS Dyar and Knab.

Aëdes atlanticus DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 193, 1906.

A medium-sized blackish mosquito, the mesonotum with a rather narrow silver line in the middle the whole length. Abdomen black, with basal segmental lateral white patches; venter pale. Legs black, the femora white below. Wing scales all dark.

The larvae occur in temporary ground pools, usually swampy and with vegetation. The adults are seldom seen. This species is said to differ from *tormentor* by having the hind tibiae dark below while those of the other species are narrowly pale. The character is difficult to observe, elusive and probably not constant. The only certain distinction between the two is the male genitalia.

Distribution.—Southern States.

[13] Howard, Dyar, and Knab, Mosq. No. & Cent. Am. & W. I., vol. 4, p. 781, 1917.

United States Records.

LOUISIANA: New Orleans, September 23, 1914 (W. V. King).
FLORIDA: Sanford, March 17, 1905 (H. G. Dyar).
GEORGIA: Brunswick, May 21, 1915 (R. H. von Ezdorf).
NORTH CAROLINA: Wilmingtom, August 16, 1918 (R. W. Leiby).
White Lake, June, 1915 (F. Sherman)
Charlotte, June 14, 1916 (H. P. Barret).
DISTRICT OF COLUMBIA: Chain Bridge, September 29, 1906 (T. Pergande).
NEW JERSEY: New Brunswick, August 1 (J. B. Smith).

AËDES (HETERONYCHA) TORMENTOR Dyar and Knab.

Aëdes tormentor DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 191, 1906.

A medium-sized blackish mosquito, the mesonotum with a rather narrow silver line in the middle the whole length. Abdomen black, with basal segmental lateral white patches; venter pale. Legs black, the femora white below. Wing scales all dark.

The species is rare, and no notes on the habits are at hand. The colorational difference between this species and *atlanticus* given in the monograph seems to be illusory, and the habitats overlap much more than there indicated. They may even be coëxtensive. The genitalia easily separate the two when males are at hand, otherwise the separation is uncertain.

Distribution.—Southern States.

United States Records.

LOUISIANA: New Orleans, September 15, 1914 (W. V. King).
ARKANSAS: Scott, August 31, 1908 (J. K. Thibault).
MISSISSIPPI: Westpoint, August 14, 1904 (H. S. Barber).
Corinth, August 14, 1904 (H. S. Barber).
FLORIDA: Jacksonville (H. Byrd).

Group SCAPULARIS.

AËDES (HETERONYCHA) INFIRMATUS Dyar and Knab.

Aëdes infirmatus DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 197, 1906.

A medium-sized blackish mosquito, the mesonotum brown, with a large silvery patch from the front to beyond the middle, not reaching the sides. Abdomen black, with basal segmental lateral white patches; venter whitish, the segments black scaled at their apices. Legs black, the femora white below, tibiae with pale reflection below. The black parts often take a metallic luster. Wing scales all dark. Proboscis black.

The larvae live in temporary ground pools. The adults are sometimes abundant after rains, but they inhabit woods and thickets, and are seldom troublesome, although said to be a persistent biter. This

is perhaps to be considered as a northern race of the tropically distributed *Aëdes scapularis* Rondani. There are certain larval differences between the two, which if directly contrasted seem marked; but the Central American form (*euplocamus* Dyar and Knab) is intermediate. The colorational characters given to separate these in the monograph are not constant.

Distribution.—Southern States.

United States Records.

TEXAS: Brownsville, August 31, 1916 (M. M. High).
LOUISIANA: New Orleans, September 15, 1914 (W. V. King).
Mound, October 13, 1913 (D. L. Van Dine).
ARKANSAS: Scott, August 31, 1908 (J. K. Thibault).
FLORIDA: Cutler, November 10, 1921 (G. F. Moznette).
West Tampa, March 18, 1905 (H. G. Dyar).
Bartow, March 20, 1905 (A. N. Caudell).
Homestead, March 12, 1917 (C. A. Mosier).
NORTH CAROLINA: Charlotte, 1920 (H. P. Barret).

AËDES (HETERONYCHA) TRIVITTATUS Coquillett.

Culex trivittatus COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, p. 193, 1902.
Culex inconspicuus GROSSBECK, Ent. News, vol. 15, p. 333, 1904.
Aëdes angustivittatus DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 9, 1907.

A medium-sized to small brown mosquito. Mesonotum brown, with two rather broad yellow lines the whole length. Head largely yellow scaled. Abdomen black with basal segmental lateral white patches; venter white. Legs black, the femora white beneath; tibiae and first tarsal joint also more or less whitish below. Wing scales all dark. Proboscis black.

The larvae live in ground pools, particularly in river valleys where the pools are filled by flood water. They also occur sparingly in irrigation water. The adults frequent the bushes and trees along the river bottoms, and will bite severely persons going to such places. The form with narrow yellow lines on the mesonotum (*angustivittatus*) is probably not separable specifically, though as yet insufficiently known. It occurs commonly in Panama but also with the normal form.

Distribution.—Panama to the upper Mississippi Valley, through the Potomac Gap to Virginia, and north to Maine.

United States Records.

NEW MEXICO: South Fork Deer Creek Canyon, Peloncillo Mountains, July 27, 1917 (C. H. T. Townsend).
TEXAS: Denison, June 14, 1904 (H. S. Barber).
Camp Stanley, May 24, 1918 (D. L. Van Dine).

COLORADO: Oxford, September 1, 1918 (I. M. Way).
MONTANA: Laurel, July 16, 1917 (H. G. Dyar).
MINNESOTA: Ottertail County, August 21, 1917 (C. W. Howard).
MISSOURI: Cypress Swamp, Mississippi County, June 15, 1918 (L. Haseman).
INDIANA: Lafayette, July 21, 1916 (J. J. Davis).
VIRGINIA: Woodstock, August 4, 1904 (F. C. Pratt).
Addison, July 6, 1916 (A. N. Caudell).
DISTRICT OF COLUMBIA: Chain Bridge, August 31, 1904 (T. Pergande).
MARYLAND: Plummer Island, July 7 (R. P. Currie).
NEW JERSEY: Chester, September 14 (J. B. Smith).
MASSACHUSETTS: Granby, September 12, 1903 (F. Knab).
South Amherst, June 10, 1903 (G. Dimmock).
MAINE: Paris, September 3, 1910 (W. C. Perham).

AËDES (HETERONYCHA) THELCTER Dyar.

Aëdes (*Taeniorhynchus?*) *thelcter* DYAR, Ins. Ins. Mens., vol. 6, p. 129, 1918.

A medium-sized mosquito. Mesonotum entirely dull yellowish scaled, the scaling coarse and thick; head similarly clothed. Abdomen black, with triangular basal segmental median and lateral whitish patches; venter pale. Legs black, the femora pale below, the tibiae and first tarsal joint also more or less pale on the under side. Wing scales all dark. Proboscis black.

The larva has not been found; but the adults occur after heavy rains with other species of similar habit, and the breeding is doubtless in temporary ground pools.

Habitat.—Southern Texas.

United States Records.

TEXAS: Brownsville, August 29, 1916 (M. M. High).
Camp McAllen, August 28, 1921 (Army Medical Museum).

Group PULLATUS.

AËDES (HETERONYCHA) AURIFER Coquillett.

Culex aurifer COQUILLETT, Can. Ent., vol. 35, p. 255, 1903.

A medium-sized or rather large brown-black mosquito. Head golden scaled in the middle and sides, dark brown between. Mesonotum with a very broad median deep blackish brown stripe, leaving the sides narrowly golden yellow. Abdomen black dorsally, with elongate triangular white basal segmental lateral spots; venter mostly whitish. Legs deep black, the femora broadly white below except at the tips. Wing scales narrow, black.

The larvae live in early spring pools, particularly cranberry bogs, hatching from overwintering eggs. The attack of the adult is described as bloodthirsty. The mating habits of the males are unknown. The species is local and rare.

Distribution.—Southern Canada to New Jersey; Minnesota.

United States Records.

MINNESOTA: Minneapolis, July 2 (K. Taylor).
NEW HAMPSHIRE: Center Harbor, July 22, 1902 (H. G. Dyar).
Dublin, June, 1909 (A. Busck).
MASSACHUSETTS: Springfield, May 21, 1903 (F. Knab).
Wilmington, July 4, 1910 (H. S. Barber).
CONNECTICUT: Suffield (G. Dimmock).
RHODE ISLAND: Weekapaug, July 5, 1904 (H. G. Dyar).
NEW JERSEY: Lahaway, April 25 (J. T. Brakeley).

AËDES (HETERONYCHA) PULLATUS Coquillett.

Culex pullatus COQUILLETT, Proc. Ent. Soc. Ent. Wash., vol. 6, p. 168, 1904.
Aëdes acrophilus DYAR, Ins. Ins. Mens., vol. 5, p. 127, 1917.
Culex jugorum VILLENEUVE, Bull. Soc. Ent. France, 1919, p. 59, 1919.
Aëdes metalepticus DYAR, Ins. Ins. Mens., vol. 8, p. 51, 1920.
Aëdes gallii MARTINI, Arch. f. Schiffs- u. Tropenkr., vol. 24, Beih. 1 p. 110, 1920.

A medium-sized black mosquito. Mesonotum dull olivaceous yellow when fresh, fading to mossy whitish; lines distinct, narrow, approximate, median lines normally present, the sides stripes more often obsolete. Abdomen black, the basal segmental white bands narrowed centrally or obsolete dorsally, widened at the sides; venter pale, with dark apical segmental bands. Legs black, the femora pale below; knee spots white. Wing scales narrow, all dark.

The winter is passed in the egg stage. The larvae develop in early ground pools, more especially muddy pools along streams and lakes. They are somewhat late in development, being among the last of the forest species to be found as larvae. The species frequents high altitudes. The males swarm after sunset in openings of the forest or over willows. In the far north, in June, when it is light practically all night, the swarms may be seen as early as 4 o'clock in the afternoon when the sun passes behind a temporary cloud.

Distribution.—Alaska and the Yukon, down the Rocky Mountains to Colorado. Alps of Europe.

United States Records.

ALASKA: Camp 327, Alaska Engineering Commission, July 12, 1921 (J. M. Aldrich).
Seward, July 25, 1921 (J. M. Aldrich).
Anchorage, July 21, 1921 (J. M. Aldrich).
Skagway, June 17, 1919 (H. G. Dyar).
IDAHO: Juliaetta, April 21, 1889 (J. M. Aldrich).
MONTANA: Whitefish, June 16, 1921 (H. G. Dyar).
COLORADO: Aspen, July 22 (P. Andrews).
Buena Vista, July 3, 1917 (Henderson and Andrews).
Estes Park Village, June 24 (T. D. A. Cockerell).

AËDES (HETERONYCHA) INTRUDENS Dyar.

Aëdes intrudens DYAR, Ins. Ins. Mens., vol. 7, p. 23, 1919.

A medium-sized black mosquito, very fond of entering houses. Head with brown scales on the vertex, a narrow line of black ones on each side, and a patch of creamy ones below. Mesonotum with dark bronzy brown scales, the posterior lateral stripes often showing faintly blackish, with a slender light line within. Abdomen black, with basal segmental white bands, generally not contracted in the middle; venter whitish scaled. Legs black, the femora pale beneath. Wing scales dark.

Liable to be confused with the *abserratus* form of *punctor* or the heavily suffused form of *cataphylla*, the male genitalia abundantly diagnostic in both cases, also similar to the unlined form of *lazarensis;* but that has always a pale margin to the mesonotum, lacking in *intrudens*.

The winter is passed in the egg state. The larvae develop in early ground pools in spring, this being one of the especially early species. The adults are short lived, disappearing comparatively early in the season. This is the most troublesome of the forest mosquitoes, from its habit of entering houses. When large numbers get in, as often happens, sleep is difficult. No other forest species behaves in this manner.

The mating habits of the males have not been observed.

Distribution.—Northern forests, Atlantic to Pacific; Europe (Germany).

United States Records.

NEW YORK: Karner, March 19, 1904 (E. P. Felt).
Elizabethtown, April 23, 1905 (H. G. Dyar).
MASSACHUSETTS: West Springfield, April 13, 1905 (Dyar and Knab).
Longmeadow, April 16, 1905 (Dyar and Knab).
NEW HAMPSHIRE: Dublin, May 23, 1910 (E. C. Stowell).
MONTANA: Whitefish, June 16, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) DIANTAEUS Howard, Dyar, and Knab.

Aëdes diantaeus HOWARD, DYAR, and KNAB, Mosq. No. & Cent. Am. W. I., vol. 4, p. 758, 1917.

Aëdes serus MARTINI, Arch. f. Schiffs- u. Tropenkr., vol. 24, Beih. 1, p. 96, 1920.

A medium-sized black mosquito. Mesonotum yellow, the two median blackish lines distinct, narrow, sometimes joined into a single median stripe; side stripes generally weak. Abdomen black, the white bands obsolete dorsally, forming triangular spots at the sides at the bases of the segments; venter whitish, the segments black at their apices. Legs deep black, the femora white below, broadly so at base. Wing scales narrow, all dark.

Liable to be confused with the normal form of *lazarensis*, from which there is no marked distinction. The form of *diantaeus* with single dark stripe (*serus*) closely resembles the normal form of *punctor* but is more slender, the legs blacker. Male genitalia always diagnostic.

The winter is passed in the egg state. Larvae in early ground pools, especially cold pools in spruce bogs; but in one river valley breeding in flood pools in summer.

The males do not swarm, but attack the females singly as these are attempting to bite some warm-blooded animal.

Distribution.—Northern forests from Atlantic to Pacific, also in northern Europe.

United States Records.

NEW HAMPSHIRE: Dublin, May and June, 1909 (A. Busck).
MONTANA: Belton, June 23, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) IRIDIPENNIS, new species.

A rather large black mosquito, with light yellow mesonotum. Integument black; mesonotum with light yellow scales, paired median and short posterior stripes black, broad. Abdomen black, with narrow basal whitish bands, widening on the sides into triangular spots; venter pale scaled, with interrupted median black line. Legs black, the femora white beneath for two-thirds. Wings iridescent, the scales black, narrow.

Described from a single female specimen, type Cat. No. 25264, U.S.N.M. The species may be found to fall in *Taeniorhynchus* when the male is known. Larvae and life habits unknown.

Distribution.—Arizona and probably southward, a similar specimen having been taken in Colombia.

United States Records.

ARIZONA: Chiricahua Mountains, August 17, 1917 (C. H. T. Townsend).

Group PUNCTOR.

AËDES (HETERONYCHA) PUNCTODES Dyar.

Aëdes punctodes DYAR, Ins. Ins. Mens., vol. 10, p. 2, 1922.

A medium-sized black mosquito. Mesonotum dark brown, with two median darker lines, generally illy contrasted or obsolete, and indistinguishable in flown specimens. Abdomen black, with basal segmental whitish bands, narrowed in the middle somewhat; venter whitish, with sprinkling of black scales. Legs black, the femora whitish beneath; tibiae and first tarsal joint also more or less pale below; knee spots white. Wing scales black.

The larva is unknown, but will doubtless be found to develop in early snow pools.

Distribution.—Alaska, central coastal region, and lower Yukon.

United States Records.

ALASKA: Teller, July 29, 1913 (F. Johannsen).
Anchorage, June 11, 1921 (J. M. Aldrich).
Valdez, June 8, 1921 (J. M. Aldrich).
Nome, August 21, 1916 (F. Johannsen).
Katmai, July, 1917 (J. S. Hine).
St. Michael (Army Medical Museum).
Iditarod, August 29, 1918 (A. H. Twitchell).
Innoko, July 12, 1917 (A. H. Twitchell).
Flat, June 12, 1917 (A. H. Twitchell).
Fairbanks, July 4, 1921 (J. M. Aldrich).
Camp 327, Alaska Engineering Commission, July 12, 1921 (J. M. Aldrich).
Camp 334, Alaska Engineering Commission, June 21, 1921 (J. M. Aldrich).
Hurricane, July 15, 1921 (J. M. Aldrich).
Healy, June 23, 1921 (J. M. Aldrich).
Virgins Bay, June 26, 1899 (T. Kincaid).
Yakutat, June 21, 1899 (T. Kincaid).
Koyukuk River, Summer, 1901 (W. J. Peters).
Goodnews Bay, July 15, 1919 (G. L. Harrington).

AËDES (HETERONYCHA) DYSANOR Dyar.

Aëdes (*Ochlerotatus*) *dysanor* DYAR, Ins. Ins. Mens., vol. 9, p. 70, 1921.

A medium-sized blackish mosquito. Mesonotum yellowish, with two narrow separate brown lines, or a single broad median one. Abdomen black above, the segmental pale basal bands much narrowed centrally, or reduced to lateral spots; venter entirely dull whitish. Legs black, the femora whitish beneath and a small white spot at tip. Wing-scales wholly dark, narrow.

Indistinguishable in coloration from the *punctor* variety of *punctor*. The species is insufficiently known, having been confused with *punctor* until very recently. The larvae have not been differentiated and may not be separable. The male genitalia, however, furnish a reliable character. The species breeds in the early spring pools.

Distribution.—Southern fringe of the evergreen forests. Possibly more widely distributed.

United States Records.

NEW HAMPSHIRE: Dublin, May (A. Busck).
NEW YORK: Plattsburg, April, 1905 (Dyar and Hudson).
WISCONSIN: Saxeville, May 23, 1909 (B. K. Miller).

AËDES (HETERONYCHA) PUNCTOR Kirby.

Culex punctor KIRBY, Richardson's Fauna Bor. Amer., vol. 4, p. 309, 1837.
Culex implacabilis WALKER, List. Dipt. Brit. Mus., vol. 1, p. 7, 1848.
Culex provocans WALKER, List. Dipt. Brit. Mus., vol. 1, p. 7, 1848.
Culex aberratus FELT and YOUNG, Science, n. s., vol. 20, p. 312, 1904.

Culicelsa auroides FELT, Bull. 79, N. Y. State Mus., p. 448, 1905.
Aëdes centrotus HOWARD, DYAR, and KNAB, Mosq. No. & Cent. Am. & W. I., vol. 4, p. 747, 1917.

A rather large blackish mosquito. Mesonotum with dark yellow or gray scales on the sides, a quadrate broad dark-brown band in the middle. Abdomen black, with basal segmental white bands, usually narrow and narrowed centrally; venter white scaled. Legs black, the femora white below. Wing scales wholly dark.

In the East the mesonotum is commonly suffused with brown, with the dark central band still visible (form *centrotus*), to entirely dark brown (form *abserratus*). The latter is difficult to distinguish from *intrudens*. In the West the typical form (*punctor=auroides*) predominates, suffused examples being rare. Here the sides of the mesonotum are as often gray as yellow; in the East, always yellow. Another variation which occurs throughout the range, although not abundantly, has the median mesonotal stripe divided, forming two lines. This is very difficult to distinguish from *lazarensis*. Both the forms of *diantaeus*, also, closely resemble corresponding forms of *punctor*. This is, however, generally a larger and more robust mosquito than *diantaeus*, the legs less deep black.

The winter is passed in the egg state, the larvae developing in early spring pools, particularly in spruce swamps. None were found in the flood pools referred to as breeding places for *diantaeus* and others. The adults are severe biters, and can be found till frost in the northern woods, although there is but a single annual generation.

Distribution.—Canadian forests from Atlantic to Pacific, except the rainy Pacific belt; mountains of New England and New York, northern Minnesota, but not the Rocky Mountains.

United States Records.

WISCONSIN: Saxeville, May 23, 1909 (B. K. Miller).
MINNESOTA: Minneapolis, July 6 (K. Taylor).
NEW HAMPSHIRE: Dublin, May, 1909 (A. Busck).
MASSACHUSETTS: Mount Tom, May 6, 1903 (F. Knab).
NEW YORK: Plattsburg, April, 1905 (H. G. Dyar).

AËDES (HETERONYCHA) LEUCONOTIPS Dyar.

Aëdes leuconotips DYAR, Ins. Ins. Mens., vol. 8, p. 24, 1921.

A rather large blackish mosquito. Mesonotum brownish yellow, with two median dark-brown lines and short posterior lateral one of the same color. Abdomen black, with basal segmental white bands, narrow and narrowed centrally; venter white scaled, with some black ones at the tips of the segments. Legs black, the femora white below; knee spots narrowly white. Wing scales all dark.

The markings are not distinguishable from *lazarensis*, although, as seen from the male genitalia and larvae, the species is extremely close to *punctor*. The winter is passed in the egg state, the larvae developing in early muskeg pools in the rainy Pacific coast strip. The mating habits of the males have not been observed.

Distribution.—Pacific coast, British Columbia to Alaska.

United States Records.

ALASKA: Ketchikan, June 20, 1919 (H. G. Dyar).
Cape Fanshaw, June 22, 1919 (H. G. Dyar).

AËDES (HETERONYCHA) CYCLOCERCULUS Dyar.

Aëdes cyclocerculus DYAR, Ins. Ins. Mens., vol. 8, p. 23, 1920.

A medium-sized blackish mosquito. Mesonotum brownish yellow, with two median brown lines, and short thick posterior lateral ones, heavier and blacker than the median ones. Abdomen black, with narrow basal segmental white bands, narrowed centrally; venter whitish scaled. Legs black, mixed with gray scales, especially below, the femora white below. Wing scales wholly dark.

By the male genitalia and larvae, this species is closely allied to *punctor*. It is a rather small species, the winter being passed in the egg state, the larvae developing in early muskeg pools in the rainy Pacific coast strip. The mating habits of the males have not been observed.

Distribution.—Pacific coast, British Columbia to Alaska.

United States Records.

ALASKA: Juneau, June 23, 1919 (H. G. Dyar).
Ketchikan, June 20, 1919 (H. G. Dyar).
Cape Fanshaw, June 22, 1919 (H. G. Dyar).

AËDES (HETERONYCHA) ABORIGINIS Dyar.

Aëdes aboriginis DYAR, Ins. Ins. Mens., vol. 5, p. 99, 1917.

A large blackish mosquito. Mesonotum yellow brown, with two broad central stripes, sometimes confluent, and short thick posterior lateral ones. Abdomen black, with basal segmental narrow white bands; venter white scaled, with more or less distinct black bands at the apices of the segments. Legs black, some whitish scales intermixed; femora white below. Wing scales wholly dark.

The markings of the mesonotum are not separable from *lazarensis*. The form with the mesonotal stripes united is practically as in *punctor*, to which this species is closely allied in the male genitalia; the larvae, however, are distinctive. The winter is passed in the egg state, the larvae developing in early spring pools of a foul character, not in typical muskeg pools. The males have been ob-

served swarming as late as 9 a. m. in bright sunlight, although in deep forest and shaded by the trunks of large trees. The females bite by day or night, as with any other forest mosquito.

Distribution.—Pacific coast, from Washington to Alaska.

United States Records.

WASHINGTON: Longmire Springs, June 17, 1917 (H. G. Dyar).
Ashford, August 1, 1906 (Dyar and Caudell).
Hoquiam, May 27, 1904 (W. E. Burke).
Lake Cushman, June 27, 1917 (H. G. Dyar).

AËDES (HETERONYCHA) HEXODONTUS Dyar.

Aëdes hexodontus DYAR, Ins. Ins. Mens., vol. 4, p. 83, 1916.

A rather large blackish mosquito. Mesonotum dark yellow, with two narrow separated brown lines, which may be wanting, leaving the surface entirely yellow, sometimes pale golden yellow; otherwise suffused with dark brown, or wholly dark brown. Abdomen black, the basal segmental white bands more or less constricted centrally, widening to lateral spots; venter whitish, with more or less distinct blackish apical segmental banding. Legs black, the femora white beneath, and with narrow white tips. Wing scales all dark.

The larvae do not appear till the snow is all gone, hatching in shallow pools in meadows or marshes or along streams, seldom very many larvae in any one pool. The adults will bite in the daytime in shaded places; but their favorite time of flight is after sunset when the darkness is almost complete. For half an hour or more they will come in numbers at this time, then diminish again. The males swarm before sunset, low near the ground behind bushes or tree trunks which the sun is still shining weakly through. After sunset they disappear.

This species is closely allied to *punctor* in the structure of the male genitalia and larvae. The adult coloration is generally not the same.

Distribution.—Mountains of California and Oregon.

United States Records.

CALIFORNIA: Fallen Leaf Lake, Eldorado County, June 10, 1916 (H. G. Dyar).
Tahoe City, Placer County, June 17, 1920 (H. G. Dyar).
Gold Lake, Sierra County, June 28, 1920 (H. G. Dyar).
Gold Lake Camp, Plumas County, June 27, 1920 (H. G. Dyar).
Camp Elwell, Plumas County, June 27, 1920 (H. G. Dyar).
Lakes Center Camp, Plumas County, June 25, 1920 (H. G. Dyar).
OREGON: Crater Lake, July 29, 1920 (H. G. Dyar).
Engineers' Camp, above Whiskey Creek, May 24, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) FISHERI Dyar.

Aëdes fisheri DYAR, Ins. Ins. Mens., vol. 5, p. 19, 1917.

A rather small black mosquito. Mesonotum dark bronzy brown. Abdomen black, the basal segmental bands yellowish, narrowly

divided in the middle, the lateral segmental spots triangular; venter with a black median band or largely black. Legs black, the femora more or less whitish beneath and with a few pale scales on the outside; tibiae with a few pale scales. Wing scales black. The male differs notably, having no scales on mesonotum or abdomen, but only long dense black hairs. It is entirely black, without any light markings. The palpi have the last joints thickened and hairy, but only slightly exceeding the proboscis.

The species breeds in early spring pools filled by melting snow banks. At the higher levels these commonly melt slowly enough so that the larvae can mature; but below 7,000 feet altitude this is not always the case. Some pools near the edge of Lake Tahoe which were full of larvae of this species dried rapidly and all perished.

Distribution.—Mountains of Placer County, California.

United States Records.

CALIFORNIA: Lake Tahoe, June 20, 1915 (A. K. Fisher).
Summit, June 22, 1920 (H. G. Dyar).

AËDES (HETERONYCHA) SPENCERII Theobald.

Culex spencerii THEOBALD, Mon. Culic., vol. 2, p. 99, 1901.

A rather small dark-gray mosquito, inhabiting the open grassy prairie. Mesonotum dark brown in the middle, a grayish stripe on each side on the margin and over antescutellar space. Abdomen with diffuse grayish white bands at bases and apices of segments, and a line of the same color down the middle, cutting the black ground into paired squarish spots; venter whitish. Legs black and grayish white, the latter color predominating beneath; femora white below. Wings with the costa, first, third, and fifth veins black scaled, the alternating ones white scaled.

The winter is passed in the egg stage, the larvae developing in early spring pools. The adults inhabit the open prairie, avoiding timber. The males swarm after sunset over prominent objects on the prairie.

Distribution.—Prairies of central Canada and northern edge of the United States.

United States Records.

NORTH DAKOTA: Devils Lake, July 20, 1921 (H. G. Dyar).
Norwich, July 16, 1921 (H. G. Dyar).
Tunbridge, July 16, 1921 (H. G. Dyar).
Rugby, July 16, 1921 (H. G. Dyar).
Knox, July 16, 1921 (H. G. Dyar).
Fargo, July 27, 1921 (H. G. Dyar).
MINNESOTA: East Grand Forks, July 24, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) IDAHOËNSIS Theobald.

Grabhamia spencerii idahoënsis THEOBALD, Mon. Culic., vol. 3, p. 250, 1903.

A rather small dark-gray mosquito, inhabiting open, dry country. Mesonotum dark brown in the middle, a grayish stripe on each side on the margin and over antescutellar space. Abdomen with grayish white bands at the bases of the segments, narrowed centrally, and a few white scales at the apices of the segments also; venter whitish. Legs black and grayish white, the latter color predominating beneath; femora white below. Wings with the costa, first, third, and fifth veins black scaled, the alternating ones white scaled.

In some specimens there is a more or less complete band of pale scales down the middle of the abdomen, and these are indistinguishable from *spencerii*.

The winter is passed in the egg state, the larvae developing in early spring pools. The adults inhabit open country, avoiding timber. The males swarm after sunset over prominent objects. There are larval differences between *idahoënsis* and *spencerii*, and they do not occupy the same territory; but the adults, under exceptional circumstances, may be confused.

Distribution.—Dry valleys from Colorado and Montana to Nevada and Washington.

United States Records.

WASHINGTON: Okanogan (A. K. Millay).
IDAHO: Market Lake (J. M. Aldrich).
Pocatello, June 24, 1904 (E. S. G. Titus).
MONTANA: Bozeman, July 12, 1917 (J. R. Parker).
Drummond, July 10, 1917 (H. G. Dyar).
Missoula, July 6, 1917 (H. G. Dyar).
Whitehall, July 11, 1917 (H. G. Dyar).
Park City, July 14, 1917 (H. G. Dyar).
NEVADA: Elburz, June 25 1903 (H. S. Barber).
Carlin, June 6, 1920 (H. G. Dyar).
UTAH: Ogden, June 20, 1920 (H. G. Dyar).
MONTANA: Big Timber, July 14, 1917 (H. G. Dyar).
Glen, July 10, 1917 (H. G. Dyar).
Laurel, July 16, 1917 (H. G. Dyar).
Lake View, August 2, 1920 (A. N. Caudell).
COLORADO: Whittier Range, Cochetopa National Forest, July 9, 1911 (A. K. Fisher).
Carbondale, July 19, 1917 (P. Andrews).
Florissant, July 4 (T. D. A. Cockerell).

AËDES (HETERONYCHA) HIRSUTERON Theobald.

Culex hirsuteron THEOBALD, Mon. Culic., vol. 2, p. 98, 1901.
Culex pretans GROSSBECK, Ent. News, vol. 15, p. 332, 1904.

A rather small, dark-gray mosquito. Mesonotum dark brown in the middle, gray on the sides and over the antescutellar space. Ab-

domen black, with basal segmental straight white bands; venter whitish. Wing scales all dark but the costa, first and third veins distinctly darker than the others. Legs black, whitish below, the femora largely white; knee spots white.

The winter is passed in the egg state, the larvae developing in the flood pools of rivers. The eggs must lie on the ground for years awaiting suitable water. In New Jersey the larvae were observed to develop in pools which had not been water filled for 12 years. The eggs, of course, may not have been there that long, although it is possible that they were. The adults are found in woods near the rivers where there have been floods. The species is related to, and possibly a race of, the European *A. sticticus* Meigen.

Distribution.—Eastern United States from the Gulf of Mexico to southern Canada, through the Potomac Gap into Virginia and northward.

United States Records.

TEXAS: Paris, April 4, 1904 (A. A. Girault).
INDIAN TERRITORY: Wister, July 3, 1904 (H. S. Barber).
ARKANSAS: Scott (J. K. Thibault).
MISSOURI: East Prairie, June 17, 1918 (E. V. Rosa, jr.).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
Memphis, April 30, 1920 (B. Mayne).
SOUTH DAKOTA: Fort Snelling, June 10, 1906 (E. B. Frick).
VIRGINIA: Woodstock, June 2, 1903 (F. C. Pratt).
MARYLAND: Herzogs Island, April 26, 1903 (W. V. Warner).
NEW JERSEY: Great Piece Meadow, April 27 (J. B. Smith).
CONNECTICUT: Hartford, April 25, 1905 (Dyar and Knab).
MASSACHUSETTS: Westfield, July 14, 1903 (F. Knab).
NEW HAMPSHIRE: Dublin, June, 1905 (A. Busck).

AËDES (HETERONYCHA) AESTIVALIS Dyar.

Culex aestivalis DYAR, Journ. N. Y. Ent. Soc., vol. 12, p. 245, 1904.

A rather small dark-gray mosquito. Mesonotum dark brown in the middle, gray on the sides and over the antescutellar space. Abdomen black, with basal segmental straight white bands; venter whitish. Wing scales all dark, but the costa, first and third veins distinctly darker than the others. Legs black, whitish below, the femora largely white; knee spots white.

The winter is passed in the egg state, the larvae developing in the flood water of lakes. This is probably a synonym of *hirsuteron*, originally separated on supposed larval differences and western distribution, but the characters have lately been shown to be without value.

Distribution.—Vicinity of lakes in the northern Rocky Mountains, Idaho to British Columbia.

United States Records

IDAHO: Sand Point, July 3, 1917 (H. G. Dyar).
MONTANA: Belton, June 23, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) ALDRICHI Dyar and Knab.

Aëdes aldrichi DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 25, p. 57, 1908.
Aëdes winnipegensis DYAR, Ins. Ins. Mens., vol. 8, p. 34, 1919.

A small dark-gray mosquito. Mesonotum yellowish, with two median dark-brown lines and short posterior lateral ones. Abdomen black, with basal segmental white bands, often narrowed in the middle; venter whitish. Legs black, largely whitish below, the femora white below. Wing scales all blackish.

The larvae occur in river flood water in shaded alder bottoms. The adults are often extremely small, so as to pass through window screens. They inhabit the woods in river bottoms, not coming out into the open country. The swarming of the males occurs in the shade even by day. The adults are voracious biters.

Distribution.—River valleys of the Rocky Mountain watershed, both east and west.

United States Records.

MONTANA: Big Timber, July 14, 1917 (H. G. Dyar).
Laurel, July 16, 1917 (H. G. Dyar).
Youngs Point, July 14, 1917 (H. G. Dyar).
Park City, July 14, 1917 (H. G. Dyar).
IDAHO: Lewiston, June 16, 1902 (J. M. Aldrich).
Market Lake, October 28, 1901 (J. M. Aldrich).
OREGON: Hood River, July 7, 1917 (F. R. Cole).
Montavilla, July 26, 1920 (H. G. Dyar).
WASHINGTON: Oysterville, June 21, 1918 (H. K. Plank).
Sumas, July 15, 1920 (H. G. Dyar).

AËDES (HETERONYCHA) GONIMUS Dyar and Knab.

Aëdes gonimus DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 165, 1917.

A small blackish mosquito. Mesonotum gray, with slight golden tint; two narrow, hairlike, dark brown lines. Abdomen black, with broad straight basal segmental white bands, widened a little at the sides; venter whitish, with narrow black bands at the apices of the posterior segments. Legs black, the femora whitish beneath. Wing scales all dark, appearing uniform.

The male and larva are unknown, and the species has not recurred to us since the original types. It is surmised that this is a flood species of the *aldrichi* group, but nothing certain is known of it.

Habitat.—Central Texas.

United States Records.

TEXAS: Kerrville, June 20, 1907 (F. C. Pratt).

AËDES (HETERONYCHA) IMPIGER Walker.

Culex impiger WALKER, List Dipt. Brit. Mus., vol. 1, p. 6, 1848.
Aëdes decticus HOWARD, DYAR, and KNAB, Mos. No. & Cent. Amer. & W. I., vol. 4, p. 737, 1917.

A small blackish mosquito. Head gray, with or without black spots. Mesonotum gray on the margins, more or less overspread with brown centrally, and with two median blackish stripes and short posterior lateral ones. Abdomen black, with rather broad basal segmental white bands, usually not narrowed centrally; venter whitish, with apical black segmental bands. Legs black, somewhat mixed with white scales, especially below, femora white below. Wing scales wholly dark. Palpi of the male with few or no white scales.

A description of the markings shows no difference from *lazarensis;* but the habitus is characteristic, and when once learned, the species can generally be recognized. The markings vary in the extent of median brown shading, which may be absent, also the lines may be narrow or broad, even completely filling the mesonotum. The winter is passed in the egg state, the larvae developing in the earliest spring pools. The males swarm low, near the ground, in front of small bushes under trees.

Distribution.—Northern forests from Atlantic to Pacific.

United States Records.

NEW YORK: Elizabethtown, April 25, 1905 (H. G. Dyar).
Plattsburgh, April 19, 1905 (H. G. Dyar).
MINNESOTA: Aitkin County, May 16, 1916 (C. W. Howard).
CALIFORNIA: Lake Tahoe, May 6, 1921 (H. G. Dyar).
ALASKA: Skagway, June 24, 1919 (H. G. Dyar).

AËDES (HETERONYCHA) CATAPHYLLA Dyar.

Aëdes cataphylla DYAR, Ins. Ins. Mens., vol. 4, p. 86, 1916.
Aëdes prodotes DYAR, Ins. Ins. Mens., vol. 5, p. 118, 1917.

A small blackish mosquito. Mesonotum gray, more or less or not at all overspread with dark brown centrally, sometimes almost completely dark brown, rarely with traces of median paired blackish lines. Abdomen black, with basal segmental white bands, rather broad and usually not narrowed centrally; venter whitish scaled. Legs black, with many white scales intermixed, especially below; femora white below. Wing scales black, often with white ones intermixed, especially along subcostal region. Palpi of the male with many white scales toward the tip of the long joint.

The mesonotal markings run into *impiger* on the one hand and into *intrudens* on the other. It is a small species, like *impiger*. The winter is passed in the egg state, the larvae developing in early spring pools. The females bite both by day and night. The males swarm high over spaces between bushes or small trees in open country.

Distribution.—Northern Rocky Mountains to Alaska, and Sierras of California.

United States Records.

ALASKA: Camp 327, Alaska Engineering Commission, July 13, 1921 (J. M. Aldrich).
Camp 334, Alaska Engineering Commission, July 9, 1921 (J. M. Aldrich).
Seward, July 24, 1921 (J. M. Aldrich).
Healy, July 7, 1921 (J. M. Aldrich).
Hurricane, July 15, 1921 (J. M. Aldrich).
Inspiration Point. July 28, 1919 (H. G. Dyar).
Skagway, June 24, 1919 (H. G. Dyar).
CALIFORNIA: Fallen Leaf Lake, June 20, 1916 (H. G. Dyar).
Tahoe City, June 18, 1920 (H. G. Dyar).
Summit, Placer County, June 20, 1920 (H. G. Dyar).
Little Truckee River, May 6, 1921 (H. G. Dyar).
MONTANA: Bozeman, May 7, 1907 (R. A. Cooley).

AËDES (HETERONYCHA) NIPHADOPSIS Dyar and Knab.

Aëdes niphadopsis DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 166, 1917.

A medium-sized light-gray mosquito. Mesonotum gray, with brown shade centrally, two narrow black lines and paired white spots, often confused into a mixture of brown and light gray, the females especially showing the less typical marking. Abdomen black with wide basal segmental white bands and scattered scales, forming a more or less developed median line; sometimes the abdomen nearly all white; venter white scaled. Legs black, with many white scales, often more white than black, the femora pale beneath. Wing scales black, those on subcostal vein and vein 3 within the cell, white in part.

The larvae occur in early spring ground pools containing more or less salt water from the mineral springs on the eastern shore of the Great Salt Lake. The adults have a coloration befitting the open desert where they fly; but in all structural points the species is close to *impiger* and *cataphylla*. The larvae show differences, but are somewhat variable and inconstant, as if in a degenerated state.

Distribution.—Eastern shore of Great Salt Lake, Utah.

United States Records.

UTAH: Salt Lake County, April 10, 1914 (C. T. Voorhies).
Salt Lake City, April 15, 1920 (H. G. Dyar).
Garfield, April 22, 1920 (H. G. Dyar).

AËDES (HETERONYCHA) LAZARENSIS Felt and Young.

Culex lazarensis FELT and YOUNG, Science, n. s., vol. 20, p. 312, 1904.
Culex borealis LUDLOW, Can. Ent., vol. 43, p. 178, 1911.

A rather large blackish mosquito. Mesonotum dull yellow, often a little mixed with blackish; two median black-brown lines and short

posterior lateral ones, usually both broad and distinct. Abdomen black with basal segmental white bands, often narrowed in the middle; venter whitish scaled, with more or less black at the apices of the segments. Legs black, femora white below; knee spots white narrowly. Wing scales all black.

The coloration of the mesonotum varies from the normal yellow to gray in the Yukon Valley (form *borealis*), and in another variety is more or less overspread with brown. The lines may be narrow, or obsolete, or much extended, in the extreme form rendering the whole mesonotum black.

No colorational characters can be given to separate all forms of *lazarensis* from *punctor*, *diantaeus*, *aboriginis*, *intrudens*, etc.

The winter is passed in the egg state, the larvae developing in early ground pools in forest, and at least in one case in flood pools. The males swarm after sunset at projecting branches of spruce trees and similar locations. The females are good biters, flying in most profusion shortly after dark. This is to be considered a race of the European *Aëdes communis* DeGeer.

Distribution.—Northern forests, from Atlantic to Pacific, except the moist Pacific coast belt.

United States Records.

NEW YORK: Elizabethtown, June 11, 1904 (E. P. Felt).
Plattsburgh, April 20, 1905 (H. G. Dyar).
NEW HAMPSHIRE: Mount Washington (A. T. Slosson).
White Mountains (H. K. Morrison).
Dublin, May (A. Busck).
MONTANA: Belton, June 23, 1921 (H. G. Dyar).
Glacier Park, July 3, 1921 (H. G. Dyar).
ALASKA: Eagle (Army Medical Museum).
Healy, June 27, 1921 (J. M. Aldrich).
Camp 334, Alaska Engineering Commission, June 21, 1921 (J. M. Aldrich).
Camp 327, Alaska Engineering Commission, June 12, 1921 (J. M. Aldrich).
Pitchfork Falls, July 28, 1919 (H. G. Dyar).
Skagway, July 8, 1919 (H. G. Dyar).

AËDES (HETERONYCHA) ALTIUSCULUS Dyar.

Aëdes altiusculus DYAR, Ins. Ins. Mens., vol. 5, p. 100, 1917.

A rather small blackish mosquito. Mesonotum dull yellow, with two narrow brown lines, varying in width, sometimes broad and approximate; disk of mesonotum grayish behind. Abdomen black, with basal segmental white bands, narrowing on the sides; venter white, with black bands at the apices of the posterior segments. Legs black, the femora pale beneath. Wing scales all dark.

The larvae occur in the early snow pools on mountain meadows, hatching long before the snow is melted. Larvae were found in a

meadow entirely snow covered, in soft spots in the snow, and were collected by dipping in the mixture of snow and water. The species is colored like normal *lazarensis* of the East, and is probably to be considered as an isolated local race thereof. The specimens are rather undersized for *lazarensis* and not of the coloration the species assumes in its nearest occurrence. There are also small larval differences.

Distribution.—Mount Rainier, Washington.

United States Records.

WASHINGTON: Mount Rainier, August 4, 1906 (Dyar and Caudell).
Indian Henry's, Longmire Springs, June 25, 1917 (Allen and Flett).

AËDES (HETERONYCHA) MASAMAE Dyar.

Aëdes (Heteronycha) masamae DYAR, Ins. Ins. Mens., vol. 8, p. 166, 1920.

A rather large blackish mosquito. Mesonotum gray, with two black lines, the disk overspread with brown in the middle, generally very broadly so, leaving only the narrow margins gray. Abdomen black, basal segmental white bands narrowed centrally; venter white, with more or less developed apical segmental black bands. Legs black, the femora white beneath; knee spots white. Wing scales all dark.

The larvae occur in small pools along little streams from the melting snow, the pools being under trees and just below the snow line. As the snow retreats up the mountain slope, successive pools appear. The adults, hatching from the lower pools, remain only in small part where hatched, but mostly follow up over the unmelted snow for 12 miles or more above the snow line. They are most numerous about the snow line, where they probably attack bears, attracted to the fresh wet grass. They are known locally as "snow mosquitoes" from this habit. This is to be considered as a local race of *lazarensis*.

Distribution.—Mountains about Crater Lake, Oregon.

United States Records.

OREGON: Crater Lake, July 30, 1920 (H. G. Dyar).
Prospect, May 24, 1921 (H. G. Dyar).
Engineer's Camp, above Whiskey Creek, May 24, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) TAHOENSIS Dyar.

Aëdes tahoensis DYAR, Ins. Ins. Mens., vol. 4, p. 82, 1916.

A rather large blackish mosquito. Mesonotum gray, with two black lines, the disk sometimes overspread with brown in the middle, generally not, and never very broadly. Abdomen black, basal segmental white bands narrowed centrally; venter white, with more or less developed apical segmental black bands. Legs black, the femora white beneath; knee spots white. Wing scales all dark.

The larvae hatch long before the snow is all melted. They occur in what become large open pools in ground hollows along the heads of mountain valleys. When the ground is still several feet deep in snow on the general level, these pools will be seen as wet places, perhaps open at one end and containing numerous well-grown larvae, crowding to the opening. After the snow is gone, the larvae and pupae remain for some days, drifting about in masses in the open pools, blown by the wind. The species occur only in the high mountains where suitable conditions occur, and though locally abundant, is incapable of general distribution, and generally annoys no one. It is to be considered as a local race of *lazarensis*, in male genitalia and larval habits the nearest to the European *communis* of any American form.

Distribution.—Mountains of California.

United States Records.

CALIFORNIA: Yosemite Valley, Mariposa County, May, 1907 (D. J. Fullaway).
Fallen Leaf Lake, El Dorado County, June 24, 1916 (H. G. Dyar).
Lake Tahoe, Placer County, June 22, 1920 (H. G. Dyar).
Summit, Placer County, June 15, 1920 (H. G. Dyar).
Gold Lake, Sierra County, June 26, 1920 (H. G. Dyar).
Bear Lake, Plumas County, June 24, 1920 (H. G. Dyar).

AËDES (HETERONYCHA) PIONIPS Dyar.

Aëdes pionips DYAR, Ins. Ins. Mens., vol. 7, p. 19, 1919.

A large blackish mosquito. Mesonotum yellow, clear and even, rarely gray; two median black brown lines, broad and distinct and running far back; two short posterior lateral ones. Abdomen black, with basal segmental white bands, narrowed in the middle; venter whitish scaled, with more or less black at the apices of the segments. Legs black, femora white below; knee spots white. Wing scales all black.

The coloration is not variable as far as observed; but the species is liable to be confused with large specimens of *lazarensis*. The winter is passed in the egg state, the larvae developing in early pools in spruce forests. The species is found only in the deepest forest or in northern regions. The males swarm after sunset in openings in the forest.

Distribution.—Northern forests, presumably from Atlantic to Pacific, although no far eastern records are available, but not in the moist Pacific coast strip.

United States Records.

MONTANA: Lake McDonald, June 25, 1921 (H. G. Dyar).
Two Medicine Lake, July 7, 8, 10, 1921 (H. G. Dyar).
ALASKA: Skagway, June 29, 1919 (H. G. Dyar).

AËDES (HETERONYCHA) PROLIXUS Dyar.

Aëdes prolixus DYAR, Ins. Ins. Mens., vol. 10, p. 1, 1922.

A rather large blackish mosquito. Mesonotum light yellow, with a broad central single brown band. Abdomen black, the pale bands much narrowed dorsally or reduced to lateral spots; venter yellowish white, with apical segmental black bands, triangularly widened and joined medioventrally into a continuous stripe. Legs black, the femora white beneath, tips narrowly white. Wing scales black.

The markings are somewhat softer and less contrasted than in normal *punctor;* but there is no tangible difference. The male genitalia are, however, diagnostic.

The life history is unknown; but there is no reason to suppose that the habits differ from those of its congeners. The larvae will be found to develop from over-wintering eggs in the early spring pools.

Distribution.—Central coastal region of Alaska.

United States Records.

ALASKA: Popoff Island, July 8, 1899 (T. Kincaid).
Valdez, June 8, 1921 (J. M. Aldrich).
Anchorage, July 21, 1921 (J. M. Aldrich).
Hurricane, July 15, 1921 (J. M. Aldrich).

Group DORSALIS.

AËDES (HETERONYCHA) DORSALIS Meigen.

Culex dorsalis MEIGEN, Syst. Besch. bek. Eur. Zweifl. Ins., vol. 6, p. 242, 1830.
Culex maculiventris MACQUART, Dipt Exot., Suppl., vol. 1, p. 7, 1846.
Culex curriei COQUILLETT, Can. Ent., vol. 33, p. 259, 1901
Culex onondagensis FELT, Bull. 79, N. Y. State Mus., p. 278, 1904.
Aëdes quaylei DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 191, 1906.
Culex lativittatus COQUILLETT, Ent. News, vol. 17, p. 109, 1906.
Grabhamia mediolincata LUDLOW, Can. Ent., vol. 39, p. 129, 1907.
Grabhamia broquettii THEOBALD, Entom., vol. 46, p. 154, 1920.
Aëdes grahami LUDLOW, Ins. Ins. Mens., vol. 7, p. 154, 1920.

A rather small yellowish-gray mosquito, the tarsi banded with white, but sometimes very inconspicuously. Mesonotum creamy yellowish, a diffused brown stripe in the middle of variable width, and a little brown on the lateral margins. Abdomen with grayish white basal segmental bands and a longitudinal mid-dorsal line, cutting the black ground into paired quadrate spots; venter pale, with median row of black spots. The pale scales on the abdomen vary, sometimes covering the whole surface. Legs black, with white scales intermixed, femora white below; tarsi with dull white rings at both ends of the joints. Wing scales dark and whitish, rather evenly intermixed, though the third vein is predominatingly dark.

The winter is passed in the egg state, the larvae developing in early ground puddles. The males swarm after sunset over prominent objects on the prairie. The females are persistent biters, especially abundant after sunset.

Distribution.—Europe, Asia, and North America in dry, open country and prairies; central United States to Canada; also as a salt-marsh breeder on the coasts of the Atlantic, Pacific, and Hudson Bay.

United States Records.

WASHINGTON: West Seattle, August 11, 1906 (Dyar and Caudell).
Oroville, June 6, 1919 (A. C. Burrill).
OREGON: Klamath Falls, July 27, 1906 (Dyar and Caudell).
CALIFORNIA: Thrall, July 25, 1906 (Dyar and Caudell).
Niles, August 31, 1901 (C. S. Jones)
Antelope Valley, June 21, 1916 (H. G. Dyar).
NEVADA: Reno, July 24, 1915 (H. G. Dyar).
UTAH: Grand Junction, September 11, 1905 (W. A. Hooker).
COLORADO: Florissant, July 10, 1907 (S. A. Rohwer).
NEW MEXICO: Pecos, June 24 (T. D. A. Cockerell).
IDAHO: Market Lake, June 18, 1901 (J. M. Aldrich).
MONTANA: Laurel, July 16, 1917 (H. G. Dyar).
NORTH DAKOTA: Devils Lake, July 17, 1921 (H. G. Dyar).
NEBRASKA: Lincoln, May (———).
WISCONSIN: Madison (S. J. Holmes).
MINNESOTA: East Grand Forks, July 22, 1921 (H. G. Dyar).
ILLINOIS: Chicago, May 4, 1900 (O. A. Johannsen).
MASSACHUSETTS: Boston, July 16, 1906 (C. W. Johnson).
NEW YORK: Ithaca, May 16, 1900 (O. A. Johannsen).
PENNSYLVANIA: Philadelphia, June 15, 1918 (H. Hornig).
LOUISIANA: Delta, June 20, 1904 (E. S. G. Titus).

AËDES (HETERONYCHA) CAMPESTRIS Dyar and Knab.

Aëdes campestris DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 213, 1907.
Aëdes callithotrys DYAR, Ins. Ins. Mens., vol. 8, p. 16, 1920.

A rather large yellowish-gray mosquito, the tarsi banded with white, but sometimes very inconspicuously. Mesonotum creamy yellowish, a diffused brown stripe in the middle of variable width, and a little brown on the lateral margins. Abdomen with grayish white basal segmental bands, and a longitudinal mid-dorsal line, cutting the black ground into paired quadrate spots; venter pale, with median row of black spots. The pale scales on the abdomen vary, sometimes covering the whole surface. Legs black, with white scales intermixed, femora white below; tarsi with dull white rings at both ends of the joints. Wing scales dark and whitish, rather evenly intermixed.

The winter is passed in the egg state; the larvae occur early in ground pools, often charged with mineral matter. The males swarm

after sunset close in the tops of small pine trees. The females bite by day or night, whenever one comes into their haunts.

Distribution.—Utah and northward, very local, but usually abundant where it occurs.

United States Records.

ALASKA: Skagway, June, 1919 (H. G. Dyar).
UTAH: Elsinore, August 6, 1907 (E. S. G. Titus).
Garfield, May 6, 1920 (H. G. Dyar).
MONTANA: Glasgow, July 15, 1921 (H. G. Dyar).
NORTH DAKOTA: Niles Siding, July 16, 1921 (H. G. Dyar).
Devils Lake, July 17, 1921 (H. G. Dyar).
MINNESOTA: East Grand Forks, July 24, 1921 (H. G. Dyar).

AËDES (HETERONYCHA) CANADENSIS Theobald.

Culex canadensis THEOBALD, Mon. Culic., vol. 2, p. 3, 1901.
Culex nivitarsis COQUILLETT, Proc. Ent. Soc. Wash., vol. 6, p. 168, 1904.

A medium-sized, dark-brown mosquito, with conspicuously ringed tarsi. Mesonotum dark brown, with more or less distinct paired narrow light-golden lines. Abdomen commonly unbanded dorsally, black, with triangular white lateral spots at the bases of the segments; venter whitish scaled. Legs black, the femora whitish beneath; tarsi with white rings involving both ends of the joints, broader on the hind tarsi, the last hind tarsal all white. Wing scales wholly dark.

The winter is passed in the egg state, the larvae developing in transient ground puddles, open woods pools and roadside ditches. The larvae will appear several times in a season, following successive filling of the pools by rain, but this probably does not indicate more than one annual generation, only that some of the eggs did not hatch at the first filling of the pool. The adults are persistent biters, being fond of attacking low, near the ground. The males swarm after sunset.

Distribution.—Gulf States to southern Canada, westward in the warmer timbered country to British Columbia.

United States Records.

FLORIDA: Orange City Junction, March 20, 1905 (Dyar and Caudell).
Jacksonville, March 2, 1905 (Dyar and Caudell).
SOUTH CAROLINA: Hartsville, June 25, 1901 (W. C. Coker).
NORTH CAROLINA: Wilmington, March 4, 1919 (M. Kisliuk, jr.).
VIRGINIA: Mount Vernon, April 29, 1903 (W. V. Warner).
KENTUCKY: Corbin, August 24, 1903 (H. S. Barber).
MARYLAND: Bladensburg, June 17, 1903 (F. C. Pratt).
PENNSYLVANIA: Shenks Ferry, October 14, 1901 (S. E. Weber).
NEW YORK: Ithaca, May 4, 1903 (O. A. Johannsen).
MASSACHUSETTS: Cummington, May 30, 1903 (F. Knab).

NEW HAMPSHIRE: Center Harbor, May 16, 1902 (H. G. Dyar).
MAINE: Caribou, August 17, 1906 (E. M. Patch).
MONTANA: Drummond, July 10, 1917 (H. G. Dyar).
Bozeman, July 12, 1917 (H. G. Dyar).
ARKANSAS: Scott, April 28, 1909 (J. K. Thibault).

Group STIMULANS.

AËDES (HETERONYCHA) EXCRUCIANS Walker.

Culex excrucians WALKER, Ins. Saund., p. 429, 1856.
Culex abfitchii FELT, Bull. 79, N. Y. State Mus., p. 381, 1904.
Culex siphonalis GROSSBECK, Can. Ent., vol. 36, p. 332, 1904.
Aëdes sansoni DYAR and KNAB, Can. Ent., vol. 41, p. 102, 1909.
Aëdes euedes HOWARD, DYAR, and KNAB, Mosq. No. & Cent. Am. & W. I., vol. 4, p. 714, 1917.

A rather large brown mosquito with ringed legs. Mesonotum yellowish gray on the sides, a broad reddish brown or dark brown band in the middle, joining the short posterior stripes but variable, sometimes all brown. Abdomen blackish, with basal segmental white bands, widening on the sides, and some white scales on the apices of the segments also; venter whitish, with a row of black dashes on middle line. Legs black, with many white scales intermixed on femora and tibiae, the tarsi with white rings at the bases of the joints, broad on the hind pair. Wings with black scales, with more or less white ones intermixed, especially along costal region.

The adult females are not certainly distinguishable from *fitchii* or *stimulans*. This is commonly a larger species than *fitchii*, the sides of the mesonotum more shaded with brown, often completely so. The wing scales commonly have few or no white scales; but all the characters are intergradient, and not of diagnostic value. The larvae and male genitalia differ conspicuously in the three species.

The winter is passed in the egg stage, the larvae developing in early spring water, woods-pools, and marshes. There is but one annual generation, though the adults last most of the summer, flying in the woods. The species does not enter houses.

Distribution.—Northern forests from New Jersey to Canada, westward to British Columbia, Yukon Valley, and Alaska.

United States Records.

NEW JERSEY: New Brunswick (J. A. Grossbeck).
NEW YORK: Watkins, May 13, 1920 (H. G. Dyar).
Plattsburg, April 24, 1905 (H. G. Dyar).
MASSACHUSETTS: Wilmington, July, 1910 (H. S. Barber).
MINNESOTA: St. Paul, June 16, 1916 (C. W. Howard).
WISCONSIN: Saxeville, May 22, 1909 (B. K. Miller).

AËDES (HETERONYCHA) MUTATUS Dyar.

Aëdes mutatus DYAR, Ins. Ins. Mens., vol. 7, p. 24, 1919.

A rather large brown mosquito with ringed legs. Mesonotum gray, with two median brown bands and short side stripes, more or less mixed with the gray and mottled, forming pale spots. Abdomen black, with basal segmental white bands, the posterior ones strongly widened at the sides; venter pale, with more or less distinct black spots at the bases of the segments mesially. Legs black, the femora and tibiae pale below; tarsi black, with broad white rings at the bases of the joints, except the last joint. Wing scales black, some white ones sometimes present subcostally.

The larvae live in pools along rivers, following the high water of spring. They have a short air tube like ordinary *Aëdes* larvae. The adults frequent timbered country till late in the season. The species is to be considered a race of *increpitus* Dyar.

Distribution.—Rocky Mountain region, British Columbia to New Mexico.

United States Records.

WASHINGTON: Spokane, July 12, 1917 (H. G. Dyar).
IDAHO: Juliaetta, April 21, 1899 (J. M. Aldrich).
MONTANA: Missoula, July 6, 1917 (H. G. Dyar).
Drummond, July 10, 1917 (H. G. Dyar).
Bozeman, July 12, 1917 (H. G. Dyar).
Evaro, July 7, 1917 (H. G. Dyar).
Laurel, July 16, 1917 (H. G. Dyar).
UTAH: Salt Lake County, April 12, 1914 (C. T. Voorhies).
WYOMING: Yellowstone Park, July 27, 1907 (W. E. Britton).
COLORADO: Florissant, July 4 (T. D. A. Cockerell).

AËDES (HETERONYCHA) INCREPITUS Dyar.

Aëdes increpitus DYAR, Ins. Ins. Mens., vol. 4, p. 87, 1916.

A large blackish mosquito with ringed legs. Mesonotum gray, a brown central band and short posterior side stripes, more or less confused and mottled. Abdomen black, with basal segmental white bands; on the posterior segments some white scales at the tips of the segments also; venter white, with traces of basal segmental black spots. Legs black, with many white scales intermixed, femora and tibiae pale below; tarsi with white rings at the bases of the joints, broadest on the hind legs, except the fifth joint. Wing scales usually wholly black.

The larvae live in spring pools in river valleys and edges of lakes. The larva has a short air tube. The adults live a long time in timbered country. The males swarm after sunset over bushes and small trees.

Distribution.—Forested regions of California and Nevada.

United States Records.

CALIFORNIA: Yosemite, May 14, 1916 (H. G. Dyar).
Fallen Leaf, June 4, 1916 (H. G. Dyar).
Tahoe City, June 20, 1920 (H. G. Dyar).
Clio, June 9, 1916 (H. G. Dyar).
Eureka, May 26, 1903 (H. S. Barber).
Pacific Grove, July 2, 1903 (I. MacCracken).
NEVADA: Glenbrook, August 25, 1915 (H. G. Dyar).

AËDES (HETERONYCHA) FLAVESCENS Müller.

Culex flavescens MÜLLER, Faun. Ins. Friedrichdalina, p. 87, 1764.
Culex lutescens FABRICIUS, Syst. Ent., p. 800, 1775.
Culex variegatus SCHRANK, Enum. Ins. Austr., p. 482, 1781.
Culex bipunctatus ROBINEAU-DESVOIDY, Mém. Soc. Nat. Hist. Paris, vol. 3, p. 405, 1827.
Culex flavus MOTSCHULSKY, Bull. Soc. Imp. Nat. Mosc., vol. 32, p. 503, 1859.
Culex arcanus BLANCHARD, Les Moust., p. 303, 1905.
Culex fletcheri COQUILLETT, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, p. 20, 1906.
Aëdes cyprius LUDLOW, Ins. Ins. Mens., vol. 7, p. 158, 1920.

A large yellowish mosquito. Mesonotum dark yellow on the sides, a broad brown median band, contiguous to faint short posterior lateral stripes. Abdomen largely or wholly overspread with yellow scales, sometimes restricted to basal bands, but diffused and with scattered scales; venter yellowish, with black scales intermixed. Legs mostly yellow scaled, the tarsi black, with basal white rings on the joints, those on the hind legs large. Wings with the scales yellowish and black, the light ones predominating.

The winter is passed in the egg state, the larvae developing in the larger ground pools on the prairie in early spring. The mating habits of the male have not been observed in America. Wesenberg-Lund describes them interestingly for the European form.[14] The adults are not abundant, but occasionally met with on prairies and open woodlands. Liable to be confused with the little-known *riparius* which belongs to the *fitchii* series, but is exactly like this in coloration.

Distribution.—Canadian prairies, Montana to Wisconsin; sporadically in Arctic regions, Hudson Bay, and Alaska, Europe and Asia.

United States Records.

MONTANA: Dillon, August 4, 1908 (R. A. Cooley).
Big Fork, November 14, 1904 (E. Ricker).
NORTH DAKOTA: Devils Lake, July 19, 1921 (H. G. Dyar).
MINNESOTA: East Grand Forks, July 24, 1921 (H. G. Dyar).
Fort Snelling, June 10, 1908 (E. B. Frick).
ALASKA: Anchorage, July 10, 16, 19, 1921 (J. M. Aldrich).

[14] Mem. Acad. Roy. Sci. Lett. Danemark, Sec. Sci., sec. 8, vol. 7, pp. 154–156, 1921.

AËDES (HETERONYCHA) ALOPONOTUM Dyar.

Aëdes aloponotum DYAR, Ins. Ins. Mens., vol. 5, p. 98, 1917.

A large reddish-brown mosquito, with ringed legs. Mesonotum more or less reddish in the integument, clothed with reddish-brown scales, nearly uniform in color and showing no gray except posteriorly. Abdomen black, with basal segmental yellowish white bands and scattered scales; venter pale yellowish, with median basal segmental black spots. Legs black, the femora and tibiae with many yellowish scales intermixed, pale beneath except tip of tibia; first tarsal joint pale nearly to tip, the rest black with basal white rings, broad on the hind legs. Wing scales black, with more or less pale yellowish ones toward costal region.

The male, larva and habits are unknown. Scattered females only have been taken. It is surmised that this may be a race of *flavescens*, but nothing certain is known.

Distribution.—Western Washington and British Columbia.

United States Records.

WASHINGTON: Ashford, August 1, 1906 (Dyar and Caudell).
Hoodsport, July 7, 1920 (H. G. Dyar).
Lake Cushman, June 28, 1917 (H. G. Dyar).

AËDES (HETERONYCHA) MERCURATOR Dyar.

Aëdes mercurator DYAR, Ins. Ins. Mens., vol. 8, p. 13, 1920.

A large blackish mosquito with ringed legs. Mesonotum clear gray on the sides, a little yellowish; a broad red-brown band in the center and posterior short side stripes. Abdomen black above, with narrow basal segmental white bands, widening to triangular spots on the sides; venter pale gray, with medioventral black band, except on the posterior segments. Legs black with white scales intermixed, the femora and tibiae pale below; tarsi black, with white rings at the bases of the joints, those on the hind legs broad. Wing scales wholly dark.

This form, considered to be a race of *stimulans*, develops in river flood pools, apparently flood filled, not seepage filled. The adults frequent the wooded areas in the river valleys and vicinity. The description is made from the types; but the coloration doubtless varies, so that the species can not be distinguished from its allies except by the male genitalia.

Distribution.—Upper Yukon Valley in Canada, doubtless in Alaska at least as far as the southward bend of the river; but no males are at hand. Females of this type have been taken at many points in Alaska, but it is impossible to make a positive determination without the male.

United States Records.

None.

AËDES (HETERONYCHA) ALBERTAE Dyar.

Aëdes albertae DYAR, Ins. Ins. Mens., vol 8, p. 12, 1920.

A large blackish mosquito with ringed legs. Mesonotum clear gray on the sides, a little yellowish; a broad red-brown band in the center and posterior short side stripes. Abdomen black above, with narrow basal segmental white bands, widening to triangular spots on the sides; venter whitish, with posterior segmental black bands and a narrow median black line. Legs black with white scales intermixed, the femora and tibiae pale below; tarsi black, with white rings at the bases of the joints, those on the hind legs broad. Wing scales wholly dark.

This form, considered to be a race of *stimulans*, develops in early spring ground pools, having been taken in the same pool with *impiger*. The larva differs slightly from that of *stimulans* proper.

Distribution.—Province of Alberta, Canada.

United States Records.

None.

AEDES (HETERONYCHA) STIMULANS Walker.

Culex stimulans WALKER, List Dipt. Brit. Mus., vol. 1, p. 4, 1848.
Culicida subcantans FELT, Bull. 97, N. Y. State Mus., p. 448, 1908.

A rather large brown mosquito with ringed legs. Mesonotum yellowish gray on the sides, a broad reddish brown or dark brown band in the middle, joining the short posterior stripes. Abdomen blackish, with basal segmental white bands, widening in the sides, and some white scales on the apices of the segments also; venter whitish, with a row of black dashes on middle line. Legs black, with many white scales intermixed on femora and tibiae, the tarsi with white rings at the bases of the joints, broad on the hind pair. Wings with black scales, many white ones intermixed, especially along costal region, but also on the other veins. There are no reliable color differences between this and *excrucians* and *fitchii*.

The winter is passed in the egg state, the larvae developing in river pools, which have been overflowed by high water. This species, with the other two mentioned, is common through the northern forests; but it is not possible to determine one from the other by the females alone, which makes exact records scarce.

Distribution.—Northern forests, from New England to Canada.

United States Records.

MASSACHUSETTS: West Springfield, April 13, 1905 (F. Knab).
Mount Holyoke, April 15, 1905 (F. Knab).

NEW YORK: Plattsburg, April 24, 1905 (H. G. Dyar).
MICHIGAN: Detroit, May, 1909 (F. B. Lowe).

AËDES (HETERONYCHA) CLASSICUS Dyar.

Aëdes stimulans classicus DYAR, Ins. Ins. Mus., vol. 7, p. 113, 1920.

A large brown mosquito with large white ringed legs. Mesonotum gray at the sides, mixed with brown and a broad red-brown central band, the marking indistinct and confused. Abdomen black, with white basal segmental bands, also many white scales scattered over the surface, the penultimate segment almost wholly white; venter white, with a narrow broken central black line. Legs black, the femora, tibiae, and first tarsal joint with as many white scales as black ones; tarsi beyond the first joint with few white scales, and basal white rings, broad on the hind legs. Wing scales black, with many white ones, on the costal half of the wing as many white as black.

The larvae occur in ground pools, associated with *canadensis*, evidently without relation to flood water. The late John B. Smith treated this form well under the name *cantans* in his Report on Mosquitoes (New Jersey Agricultural Experiment Station, 1905). It is to be considered a race of *stimulans*.

Distribution.—Southern New York and New Jersey.

United States Records.

NEW YORK: Fort Wadsworth, May 20, 1920 (Army Medical Museum).
NEW JERSEY: Hudson County, May 19, 1920 (W. R. Bryce-Delaney).
Newark, March 28 (J. B. Smith).
Morristown, May 1 (J. B. Smith).
Short Hills, May 17, 1906 (W. W. Renwick).
New Brunswick, May 10 (J. B. Smith).

AËDES (HETERONYCHA) MISSISSIPPII Dyar.

Aëdes stimulans mississippii DYAR, Ins. Ins. Mens., vol. 8, p. 113, 1920.

A large brown mosquito with ringed legs. Mesonotum yellowish gray on the sides, shaded with brown centrally, but diffused and appearing almost unicolorous brownish. Abdomen black, with basal segmental white bands and scattered white scales, venter grayish white with traces of median black line. Legs black, with white scales intermixed on femora and tibiae; tarsi black with moderate basal white rings. Wing scales black, with white ones intermixed in costal region.

This form is considered a race of *stimulans;* but is at present known in only two specimens, bred from water in a tree stump, associated with *Orthopodomyia signifer* Coquillett.

Distribution.—Mississippi.

United States Records.

MISSISSIPPI: Electric Mills (J. A. Le Prince).

AËDES (HETERONYCHA) CANTATOR Coquillett.

Culex cantator COQUILLETT, Can. Ent., vol. 35, p. 255, 1903.

A medium-sized brown mosquito, with very small tarsal rings. Mesonotum reddish brown, a little gray over the antescutellar space, median and posterior lateral bands faintly darker. Abdomen black, with dull-white basal segmental bands, excavated centrally, the scales also somewhat diffused and occupying most of the last segment dorsally; venter whitish, with median black spots. Legs blackish brown, the femora white below; tarsi with very narrow white rings at the bases of the joints. Wing scales wholly blackish.

Very much like *vexans* in coloration, but wholly unrelated thereto. The coloration of the abdomen furnishes the best differentiation.

The winter is passed in the egg state, the larvae developing in salt-marsh pools along the Atlantic littoral, several generations succeeding each other, according as the pools are filled by exceptionally high tides or rains. The females travel some miles inland, and become annoying far from their breeding places. The mating habits of the males have not been described.

Distribution.—Atlantic coast from Maryland to Maine.

United States Records.

MAINE: Lincolnville, August, 1907 (H. G. Dyar).
Portland, September 5, 1920 (Army Medical Museum).
MASSACHUSETTS: Melrose Highlands, May 22, 1908 (F. B. Lowe).
RHODE ISLAND: Weekapaug, July 22, 1903 (H. G. Dyar).
CONNECTICUT: New Haven, May 12, 1904 (H. L. Viereck).
NEW YORK: Sheepshead Bay, July 22, 1900 (H. C. Weeks).
Center Moriches, September, 1903 (P. Fowler).
Bellport (H. G. Dyar).
Babylon, July 1, 1903 (W. W. Hewlett).
Northport, July 7, 1903 (J. P. Heyen).
NEW JERSEY: Summit, May 6 (La Rue Holmes).
Salt Meadows, April 10 (H. H. Brehme).
South Orange, July 20, 1903 (S. Miller).
Fort Hancock (Army Medical Museum).
MARYLAND: Chesapeake Beach, August 31, 1913 (F. Knab).

AËDES (HETERONYCHA) FITCHII Felt and Young.

Culex fitchii FELT and YOUNG, Science, new series, vol. 20, p. 312, 1904.

A rather large brown mosquito with ringed legs. Mesonotum yellowish gray on the sides, a broad reddish brown or dark brown band in the middle, joining the short posterior stripes. Abdomen blackish, with basal segmental white bands, widening on the sides, and some white scales on the apices of the segments also; venter

whitish, with a row of black dashes on middle line. Legs black, with many white scales intermixed on femora and tibiae, the tarsi with white rings at the bases of the joints, broad on the hind pair. Wings with black scales, with more or less white ones intermixed, especially along costal region.

The adult females are not certainly distinguishable from *excrucians* and *stimulans*. This species is commonly smaller than those and often has many white scales on the wings, the mesonotum is often clear gray on the sides, but none of the characters hold. The species is less closely addicted to forests than *excrucians*, being common on the prairies where some cover exists, and in the half-open country of the Yukon region. The males swarm as with *excrucians* and *stimulans*, there being no differences in these habits between the three.

The winter is passed in the egg state, the larvae developing in early spring water, often with *excrucians*. The adults fly till late in the season, not entering houses.

Distribution.—Eastern forests to the Canadian Plains.

United States Records.

NEW HAMPSHIRE: Dublin (A. Busck).
MASSACHUSETTS: Mount Holyoke, April 15, 1905 (Dyar and Knab).
Longmeadow, April 16, 1905 (Dyar and Knab).
Springfield, May 17, 1905 (F. Knab).
NEW YORK: Plattsburgh, April 24, 1905 (H. G. Dyar).
Watkins, May 13, 1920 (H. G. Dyar).
WISCONSIN: Saxeville, May 22, 1909 (B. K. Miller).

AËDES (HETERONYCHA) MIMESIS Dyar.

Aëdes mimesis DYAR, Ins. Ins. Mens., vol. 5, p. 116, 1917.

A large blackish mosquito with ringed legs. Mesonotum light gray at the sides, a broad brown central band and short posterior side lines. Abdomen black above, with triangular segmental basal white spots, separated from the lateral spots in some cases; posterior segments white tipped also; venter white scaled with more or less of median narrow black line. Legs black, the femora and tibiae with many white scales, and pale beneath, tarsi black, with white rings at the bases of the joints, rather broad on the hind legs. Wing scales black, with many white ones intermixed on all the veins.

The larvae occur in marsh pools in the spring. This form is considered a race of *fitchii*, from which there are small larval differences.[15]

Distribution.—Rocky Mountain region, Montana to the Yukon Valley in Canada.

[15] Dyar, Ins. Ins. Mens., vol. 8, p. 15, 1920.

United States Records.

MONTANA: Drummond, July 10, 1917 (H. G. Dyar).
Whitehall, July 11, 1917 (H. G. Dyar).
Bozeman, July 12, 1917 (H. G. Dyar).

AËDES (HETERONYCHA) PALUSTRIS Dyar.

Aëdes palustris DYAR, Ins. Ins. Mens., vol. 4, p. 89, 1916.
Aëdes palustris, var. *pricei* DYAR, Ins. Ins. Mens., vol. 5, p. 16, 1917.

A large blackish mosquito with ringed legs. Mesonotum gray at the sides, often intermixed with brown, a broad brown dorsal stripe and short posterior side stripes, not clearly marked. Abdomen black with basal segmental triangular spots, often separated from the lateral spots and sometimes joined into a longitudinal dorsal line (var. *pricei*); venter white, with broken narrow median black line. Legs black, with many white scales on femora, tibiae and first tarsal joint, the femora pale below; tarsi black, with white rings at the bases of the joints, broad on the hind legs. Wing scales black, with many white ones intermixed on all the veins.

The larvae live in early marsh pools. The form is considered a race of *fitchii*, the differences in larvae and male genitalia not being marked. The adults fly in forest till late summer.

Habitat.—Mountains of California and Oregon, coastal region of Pacific from Washington to Alaska where the land is not too precipitous.

United States Records.

CALIFORNIA: Yosemite, May 20, 1916 (H. G. Dyar).
Fallen Leaf Lake, June 24, 1916 (H. G. Dyar).
Tahoe City, June 17, 1920 (H. G. Dyar).
Truckee, June 21, 1920 (H. G. Dyar).
Summit, June 22, 1920 (H. G. Dyar).
Gold Lake Camp, July 21, 1916 (H. G. Dyar).
Camp Elwell, June 24, 1920 (H. G. Dyar).
OREGON: Crater Lake, July 30, 1920 (H. G. Dyar).
WASHINGTON: Lake Cushman, June 27, 1917 (H. G. Dyar).
ALASKA: Healy, June 24, 1921 (J. M. Aldrich).

AËDES (HETERONYCHA) RIPARIUS Dyar and Knab.

Aëdes riparius DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 213, 1907.

A large yellowish mosquito. Mesonotum dark yellow on the sides, a broad brown band in the middle, contiguous to faint short posterior lateral stripes, the mesonotum more or less overspread with brown. Abdomen blackish, with yellowish diffuse basal segmental bands and scattering pale scales; venter yellowish, with black scales intermixed. Legs mostly yellow scaled, the tarsi black, with basal white rings on the joints, those on the hind legs large. Wings with the scales dark, many yellowish ones intermixed.

The larva is unknown and the habits of the males have not been observed. The adults occur in wooded prairie, but are so much like *flavescens* as to be indistinguishable without males. The species requires further study, although evidently distinct.

Distribution.—Canadian prairies, probably coëxtensive with *fletcheri*, but has not been differentiated. Probably extends into northern Minnesota, but collections are lacking that contain males.

United States Records.

None.

AËDES (HETERONYCHA) GROSSBECKI Dyar and Knab.

Aëdes grossbecki DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 201, 1906.
Culex sylvicola GROSSBECK, Can. Ent., vol. 38, p. 129, 1906.

A large brownish-gray mosquito with ringed legs. Mesonotum whitish on the sides, with a dark brown central band, which widens out squarely posteriorly by junction with the posterior side stripes; a little brown also anteriorly on lateral angles of mesonotum. Abdomen black, with broad straight basal segmental white bands and scattered white scales, the last segment without basal band; some white scales apically on the terminal segments; venter whitish, with scattered black scales and traces of dark bands at the apices of the segments. Legs black with scattered white scales, the femora pale beneath; tarsi with white rings at the bases of the joints, broad on the hind legs. Wing scales broadly ovate, black and white rather evenly intermixed.

The larvae occur in spring in woods pools, often associated with *canadensis*. The species is rare and local, apparently on the verge of extinction.

Distribution.—Eastern United States, New Jersey to Mississippi.

United States Records.

NEW JERSEY: New Brunswick, May 17 (J. A. Grossbeck).
Livingston Park, May 5 (J. A. Grossbeck).
Elizabeth, May 28, 1906 (D. S. Carmody).
MARYLAND: Baltimore (T. H. Coffin).
VIRGINIA: Grassymead, June 19, 1906 (F. Knab).
MISSISSIPPI: Natchez, April, 1903 (A. Fleming).
Scott, April 24, 1915 (M. B. Mitzmain).

AËDES (HETERONYCHA) SQUAMIGER Coquillett.

Culex squamiger COQUILLETT, Proc. U. S. Nat. Mus., vol. 25, p. 85, 1902.
Grabhamia de nicdmannii LUDLOW, Can. Ent., vol. 36, p. 234, 1904.

A rather large brownish-gray mosquito with ringed legs. Mesonotum largely suffused with dull brown, leaving a little gray about the margin and in two narrow posterior lines, confused, generally without definite pattern. Abdomen black, with many scattered white

scales, the basal segmental bands widely triangular, separated from the lateral spots; white scales apically on the terminal segments; venter whitish, legs black, with pale scales intermixed; femora and tibiae pale below; tarsi with white rings at the bases of the joints, rather broad on the hind pair. Wing scales rather broadly ovate, black, with many white ones rather evenly intermixed.

The larvae inhabit salt marshes, in pools and narrow channels that are filled by the higher monthly tides. The adults frequent bushes in ravines near the shore. The species is extremely local and with very limited distribution. The marshes where it can breed are very few, and easily reclaimed, so that the species seems doomed with the advance of civilization. In certain localities the species has been occasionally numerous and troublesome.

Distribution.—Coast of California between San Francisco and San Diego, where marshes are formed at the outlets of rivers.

United States Records.

CALIFORNIA: Oakland, August 26, 1903 (I. McCracken).
Stanford University (V. L. Kellogg).
San Lorenzo, June 28, 1901 (G. Eisen).
Nordhoff, May 31, 1904 (A. D. Hopkins).
Hueneme, Ventura County, May 28, 1918 (F. M. Jones).
Laguna Beach (C. S. Baker).
San Diego, March 9, 1906 (J. M. French).
National City, June 19, 1906 (Dyar and Caudell).

Group THIBAULTI.

AËDES (HETERONYCHA) THIBAULTI Dyar and Knab.

Aëdes thibaulti DYAR and KNAB, Proc. Ent. Soc. Wash., vol. 11, p. 174, 1910.

A rather large blackish mosquito. Mesonotum grayish yellow on the sides, a moderately wide median dark brown band, which widens squarely posteriorly by fusion with the posterior side stripes. The marking is distinct and contrasted. Abdomen black above, with basal segmental triangular lateral white spots; venter whitish, with traces of black apical segmental bands, especially on the sides of the venter. Legs black, the femora white below; knee spots white. Wing scales all black, narrow.

The habits and life history are unknown, the species being so rare that they have not come under observation.

Distribution.—Gulf States.

United States Records.

ARKANSAS: Scott, April 27, 1909 (J. K. Thibault).
Cummins, May 8, 1915 (J. A. Le Prince).
Brinkley, May 3, 1915 (J. A. Le Prince).
Stuttgart, April 28, 1915 (J. A. Le Prince).
LOUISIANA: Mound, May 15, 1915 (D. L. Van Dine).
MISSOURI: Cypress Swamp, Mississippi County, June 15, 1918 (L. Haseman).

Group TRICHURUS.

AËDES (HETERONYCHA) TRICHURUS Dyar.

Culex trichurus DYAR, Journ. N. Y. Ent. Soc., vol. 12, p. 170, 1904.

A large dark-gray mosquito. Mesonotum gray on the sides, a dark brown band centrally joining the brown posterior lateral stripes, but these markings often diffused and not contrasted. Generally a small whitish space in front of the lateral stripes. Abdomen black, with broad basal segmental white bands, even; venter whitish-scaled. Legs black, the femora white towards base nearly to tip below. Wing scales black.

The winter is passed in the egg state, the larvae developing in the early ground-pools, in the forest. The male is unknown. The adults fly in woods, but disappear early in the season.

Distribution.—Western slope of Rocky Mountains in British Columbia and Montana.

United States Records.

MONTANA: Whitefish, June 16, 1921 (H. G. Dyar).
Belton. June 23, 1921 (H. G. Dyar.)

AËDES (HETERONYCHA) CINEREOBOREALIS Felt and Young.

Culex cinereoborealis FELT and YOUNG, Science, n. s., vol. 20, p. 312, 1904.
Aëdes poliochros DYAR, Ins. Ins. Mens., vol. 7, p. 35, 1919.

A large dark-gray mosquito. Mesonotum gray on the sides, with moderate central brown band, widening squarely behind from junction with the posterior lateral stripes. The marking is often faint or diffused. Abdomen black, with even basal segmental white bands, and a few scattered white scales, especially posteriorly; venter whitish. Legs black with some scattered scales, the femora whitish below. Wing scales all black.

The larvae occur in early spring pools in forest and leafy shaded ditches along roads. The mating habits of the males have not been observed. The adults disappear early in the season. The form is to be considered as a race of *trichurus*. There are slight larval differences, but the male genitalia have not been compared.

Distribution.—Southern fringe of the Canadian forest area, southern Canada, New England, New York and Minnesota.

United States Records.

NEW HAMPSHIRE: Dublin, May, 1909 (A. Busck).
Pike, May 25, 1908 (A. D. Hopkins).
MASSACHUSETTS: Chicopee, May 17, 1908 (A. D. Hopkins).
Springfield (G. Dimmock).

NEW YORK: Plattsburgh, April, 1905 (H. G. Dyar).
Karner, May 16, 1904 (E. P. Felt).
Ithaca, May 12, 1901 (O. A. Johannsen).
WISCONSIN: Saxeville, May 31, 1909 (B. K. Miller).

Group ALPINUS.

AËDES (HETERONYCHA) ALPINUS Linnaeus.

Culex alpinus LINNAEUS Flora Lapp., ed. 2, p. 381, 1792.
Culex nigripes ZETTERSTEDT, Ins. Lapp., p. 807, 1838.
Aëdes innuitus DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 166, 1917.
Aëdes n. sp. DYAR, Rept. Can. Arct. Exp., vol. 3, pt. C, p. 33, 1919.

A rather large black mosquito, with long hairy vestiture, especially conspicuous on under side of thorax. Mesonotum dark brown scaled, usually uniformly, a little lighter on the margins; setae long. Abdomen black, with broad basal segmental white bands; venter whitish scaled. Legs black, more or less sprinkled with white scales. The femora pale beneath. Wing scales black.

The larva develops in early summer in ground pools in the Arctic regions. The larva has the anal segment ringed, and detached teeth on the pecten of air tube, and is well figured by Wesenberg-Lund in his classical paper on Danish mosquitoes. The habits of the males are unknown.

Distribution.—Arctic Europe, Greenland, and North America.

United States Records.

ALASKA: Konganevik, Camden Bay, July 4, 1914 (F. Johannsen).
Collinson Point, July 22, 1914 (F. Johannsen).

AËDES (HETERONYCHA) NEARCTICUS Dyar.

Aëdes nearcticus DYAR, Rept. Can. Arct. Exp., vol. 3, pt. C, p. 32, 1919.
Aëdes (*Ochlerotatus*) *parvulus* EDWARDS, Bull. Ent. Res., vol. 3, p. 314, 1921.

A medium-sized black mosquito, much like *alpinus*, rather smaller, the legs less white speckled. The male genitalia differ in being less strongly chitinized, and the filament of the claspette has a broader expansion. The larvae have the pecten teeth of the air tube even, the anal segment not ringed.

The larvae develop in early summer in ground pools in the arctic regions. The habits of the males are unknown. This species flies with *alpinus*, both having a circumpolar distribution.

In both this species and *alpinus*, the basal lobe of the sidepiece of the male hypopygium is normally evenly haired, though sometimes the marginal hair is thickened into a distinct spine.

Distribution.—Arctic Europe and America.

United States Records.

ALASKA: Konganevik, Camden Bay, July 4, 1914 (F. Johannsen).

Subgenus TAENIORHYNCHUS Lynch Arribalzaga.[16]

AËDES (TAENIORHYNCHUS) ATROPALPUS Coquillett.

Culex atropalpus COQUILLETT, Can. Ent., vol. 34, p. 292, 1902.

A small blackish mosquito. Mesonotum silvery gray on the sides; a dark brown median band, joining the short posterior lateral bands. Abdomen black, with even basal segmental white bands; venter white scaled with black bands at the apices of the segments. Legs black, the femora whitish beneath; tips of femora and tibiae and tarsal joints at bases and apices narrowly white, the last hind tarsal all white. Wing scales all blackish.

The larvae live in holes in rocks along streams and the edges of lakes. The winter is passed in the egg state, the eggs fastened on the side of the rock. In summer generations the eggs are scattered loosely. The adults are good biters in the vicinity of their breeding places, which are necessarily very restricted, so that the species is never more than locally common. The mating habits of the males are unknown.

Distribution.—Atlantic coast region from Virginia to New England. Specimens from Saxeville, Wisconsin, reported in the monograph, are not this species but *canadensis.*

United States Records.

NEW HAMPSHIRE: Center Harbor, September 17, 1902 (H. G. Dyar).
White Mountains (H. K. Morrison).
MASSACHUSETTS: Cummington, July 5, 1903 (F. Knab).
Westfield, July 4. 1903 (F. Knab).
CONNECTICUT: Double Beach, July 21, 1904 (P. L. Butrick).
NEW YORK: Tupper Lake, August, 1904 (H. G. Dyar).
PENNSYLVANIA: Shenk's Ferry, October 21, 1901 (S. E. Weber).
MARYLAND: Great Falls, August 9, 1903 (F. C. Pratt).
Plummer Island, June 5, 1903 (W. V. Warner).
DISTRICT OF COLUMBIA: Chain Bridge, August 17, 1914 (H. G. Dyar).
VIRGINIA: Difficult Run, August 8, 1906 (Knab and Barber).
Richmond, October 26, 1901 (E. G. Williams).

AËDES (TAENIORHYNCHUS) EPACTIUS Dyar and Knab.

Aëdes epactius DYAR and KNAB, Proc. U. S. Nat. Mus., vol. 35, p. 53, 1908.

A small blackish mosquito. The markings and coloration are as in *atropalpus*, the lateral scales of the mesonotum somewhat whiter.

The larvae live in rock holes along streams. The form is doubtless to be considered a race of *atropalpus.*

Distribution.—Mexico and Arizona.

United States Records.

ARIZONA: Sabiño Basin, Catalina Mountains, August 23, 1918, larvae only (C. H. T. Townsend).

[16] This subgeneric name becomes *Culiselsa* Felt in case *Taeniorhynchus* is used to replace *Mansonia.*

AËDES (TAENIORHYNCHUS) VARIPALPUS Coquillett.

Culex varipalpus COQUILLETT, Can. Ent., vol. 34, p. 292, 1902.
Taeniorhynchus sierrensis LUDLOW, Can. Ent., vol. 37, p. 231, 1905.

A small blackish mosquito with white-ringed legs. Mesonotum dark brown, ornamented with a patch of light golden scales in front and a narrow line of the same from the lateral groove backward. Abdomen black, with basal segmental even white bands; venter whitish scaled. Legs black, the femora white below; tips of femora and tibiae and the apices of the tarsal joints silvery white, involving the bases of the joints to a less extent; rings narrow, except on the hind legs, where they are broad, involving the whole of the last joint. Wing scales wholly dark, thick and dense.

The larvae live in the water in holes in tree trunks, occasionally in artificial receptacles. The winter is passed in the egg state; it is not known whether there is more than one annual generation. The females occasionally occur in annoying numbers in old forests, but are usually rare. The males form little swarms in the daytime about some stationary warm-blooded animal, and mate with the females as these come to bite.

Distribution.—Pacific coast region from southern California to British Columbia.

United States Records.

ARIZONA: Sabino Basin, Catalina Mountains, August 23, 1918 (C. H. T. Townsend).
Williams, July 29 (H. S. Barber).
CALIFORNIA: Pasadena, May 11, 1906 (H. G. Dyar).
San Raphael, July 14, 1904 (E. H. Ashman).
Stanford University, July 7, 1903 (I. McCracken).
Orr's Hot Springs, Mendocino County, July, 1921 (D. Dyar).
Bair's Ranch, Humboldt County, June, 1903 (H. S. Barber).
Eureka, June 3, 1903 (H. S. Barber).
Fieldbrook, May 26, 1903 (H. S. Barber).
Dunsmuir, July 19, 1906 (A. N. Caudell).
Yosemite, May 16, 1916 (H. G. Dyar).
NEVADA: Glenbrook, August 25, 1915 (H. G. Dyar).
OREGON: Rockaway, Tillamook County, June 27, 1910 (L. P. Rockwood).
Portland (R. P. Currie).
Ashford, August 4, 1906 (Dyar and Caudell).
WASHINGTON: Kent, June 20, 1907 (H. E. Burke).
Seattle, July 31, 1906 (Dyar and Caudell).
Lake Cushman, July 4, 1920 (H. G. Dyar).

AËDES (TAENIORHYNCHUS) FLUVIATILIS Lutz.

Culex fluviatilis LUTZ in Bourroul, Mosq. do Brasil, pp. 42, 72, 1904.
Danielsia mediomaculata THEOBALD, Mon. Culic., vol. 4, p. 245, 1907.
Danielsia tripunctata THEOBALD, Mon. Culic., vol. 4, p. 247, 1907.
Aëdes lithœcctor DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 201, 1907.
Aëdes zoösophus DYAR and KNAB, Ins. Ins. Mens., vol. 5, p. 165, 1918.

A medium-sized blackish mosquito with ringed legs and golden mesonotum. Mesonotum whitish golden on anterior half, this color also along the margins and antescutellar space behind, leaving a double brown patch on each side. Abdomen black above, with whitish basal segmental lateral spots and a more or less distinct dorsal row or broken pale line; venter whitish, the segments more or less, sometimes strongly, bordered with black at their apices. Legs black, the femora white beneath toward base; tarsi with moderate white rings at the bases of the joints, often slightly involving the tips also.

The larvae live in holes in rocks along streams which become water filled. The adults bite readily, but occur only in the vicinity of rocky streams. Our single United States example differs in some details from the tropically distributed form, and perhaps will have to be separated as race *zoösophus*.

Distribution.—Tropical America, from Brazil to Texas.

United States Records.

TEXAS: Kerrville, August 19, 1909 (F. C. Pratt).

AËDES (TAENIORHYNCHUS) TAENIORHYNCHUS Wiedemann.

Culex taeniorhynchus WIEDEMANN, Dipt. Exot., p. 43, 1821.
Culex damnosus SAY, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 11, 1823.

A rather small blackish mosquito. Mesonotum dark brown, uniform. Abdomen black, with narrow basal segmental white bands, lateral spots white, those on the posterior segments about the middle of the segment and often visible in dorsal view; venter sordid yellowish, with dark bands at the apices of the segments. Legs black, the femora white beneath, tibiae somewhat sprinkled with pale scales; tarsi with narrow white rings at the bases of the joints, wider on the hind legs, the fifth hind tarsal all white or nearly so. Proboscis with a narrow white ring. Wing scales wholly blackish.

The larvae inhabit pools near the seacoast that are slightly saline, but not directly filled by tides. They sometimes occur in enormous numbers along the coast. This is the species which in Florida is said to turn a white horse black in an instant when one drives into cover. It is not as abundant as *sollicitans* on the north Atlantic coast.

Distribution.—Atlantic and Pacific coasts of America, from the Tropics to the lower temperate regions.

United States Records.

CONNECTICUT: East River, July 27, 1908 (C. R. Ely).
NEW YORK: Bellport, August, 1902 (H. G. Dyar).
Babylon, July 1, 2903 (W. W. Hewlett).
Sag Harbor, July 7, 1903 (C. E. Wells).

MARYLAND: Piney Point (T. Pergande).
Chesapeake Beach, August 21, 1906 (F. Knab).
VIRGINIA: Virginia Beach, September 20, 1911 (H. G. Dyar).
GEORGIA: Brunswick, May 21, 1915 (R. H. von Ezdorf).
SOUTH CAROLINA: Parr's Island, September, 1921 (J. C. Parham).
LOUISIANA: Ruddock, July 17, 1901 (———).
MISSISSIPPI: Ship Island, July 14, 1914 (R. H. von Ezdorf).
TEXAS: Victoria, May 5, 1904 (E. G. Hines).
Houston, July, 1921 (A. C. Chandler).
Cypress Bayou (J. D. Mitchell).
CALIFORNIA: San Diego, June 2, 1906 (Dyar and Caudell).
Carpinteria, July 2, 1906 (H. G. Dyar).

AËDES (TAENIORHYNCHUS) PORTORICENSIS Ludlow.

Taeniorhynchus niger GILES (not Theobald), Journ. Trop. Med., vol. 7, p. 382, 1904.
Culex portoricensis LUDLOW, Can. Ent., vol. 37, p. 386, 1905.

A rather small blakish mosquito. Differs from *taeniorhynchus* only in having the last hind tarsal joint strongly blackish tipped.

The habits are the same as those of *taeniorhynchus*, of which this is to be considered a local race.

Distribution.—Antilles and southern Florida.

United States Records.

FLORIDA: Osprey, August 31, 1901 (S. G. Webb).
Estero, July, 1907 (J. B. van Duzee).
Adam Key, March 21, 1917 (T. E. Snyder).
Tampa, March 18, 1905 (H. G. Dyar).
New Smyrna, March 21, 1905 (Dyar and Caudell).
Miami, March 12, 1905 (Dyar and Caudell).
Palm Beach (H. G. Dyar).
Biscayne Bay (A. T. Slosson).
Knights Key, December 2, 1908 (W. H. Sligh).
Key West, June 27, 1901 (C. N. Barney).
Loggerhead Key, Dry Tortugas, June 19, 1910 (A. G. Mayer).

AËDES (TAENIORHYNCHUS) NIGROMACULIS Ludlow.

Grabhamia nigromaculis LUDLOW, Geo. Wash. Univ. Bull., vol. 5, p. 85, 1907.
Grabhamia grisea LUDLOW, Can. Ent., vol. 39, p. 139, 1907.

A rather large blackish mosquito with ringed legs. Mesonotum bronzy yellow, a median dark-brown band and dark brown at the sides, the pleura white scaled. Abdomen black with basal segmental and median longitudinal bands of dull yellowish, the lateral spots prolonged and of about the same shade as the dorsal markings; venter sparsely dull yellowish scaled. Legs black; femora, tibiae, and first tarsal with many yellowish scales; femora sparsely black sprinkled below; tarsi black, with white rings at the bases of the joints, rather broad in the hind legs; knee spots white. Proboscis with a white ring. Wing scales black, a few whitish ones intermixed along the costa.

The winter is passed in the egg state, the larvae developing in early ground pools in dry country. In the presence of irrigation several generations, or hatchings, may occur in the season and the species become abundant. The females are severe biters. The males swarm after sunset over prominent objects on the prairie.

Distribution.—Dry valleys and plains from Mexico to Canada.

United States Records.

NEW MEXICO: Springer, August 25, 1909 (C. N. Ainslie).
Cimarron, September, 1909 (C. N. Ainslie).
Las Vegas Hot Springs, August 3 (H. S. Barber).
Koehler, July 20, 1913 (W. R. Walton).
COLORADO: Oxford, September 1, 1918 (I. M. Way).
Grand Junction, July 12, 1911 (G. P. Weldon).
Akron, June 24, 1909 (H. L. Shantz).
Boulder, September 2, 1907 (S. A. Rohwer).
TEXAS: Brownsville, August 28, 1916 (M. M. High).
Plano, November (E. S. Tucker).
MONTANA: Cascade, July 25, 1907 (W. E. Britton).
Laurel, July 16, 1917 (H. G. Dyar).
Whitehall, July 11, 1917 (H. G. Dyar).
Bozeman, July 12, 1917 (H. G. Dyar).
Bigtimber, August 25, 1908 (R. A. Cooley).
WYOMING: Basin, August 3, 1917 (W. V. King).
IDAHO: Boise, August 4, 1901 (C. B. Simpson).
NORTH DAKOTA: Devils Lake, July 20, 1921 (H. G. Dyar).
Grand Forks, July 21, 1921 (H. G. Dyar).
SOUTH DAKOTA: Brookings, summer, 1889 (J. M. Aldrich).

AËDES (TAENIORHYNCHUS) MITCHELLAE Dyar.

Culex mitchellae DYAR, Journ. N. Y. Ent. Soc., vol. 13, p. 74, 1905.

A medium-sized blackish-brown mosquito with ringed legs. Mesonotum rusty brown, darker on the sides and streaked with lighter centrally. Abdomen black, with yellowish-white basal segmental bands and median longitudinal stripe; venter gray, with black and white scales intermixed. Legs black, with many white scales intermixed, especially on femora and tibiae; femora pale below; tarsi with snowy white rings at the bases of the joints, the last joint all white. Wing scales entirely black. Probiscis with a white ring.

The larvae occur in early ground pools. The species is very seldom met with, and then in small numbers. The habits are unknown.

Distribution.—Southern States.

United States Records.

TEXAS: Victoria, April 5, 1919 (J. D. Mitchell).
ALABAMA: Mobile, March, 1905 (G. Dimmock).
FLORIDA: Kissimmee, March 19, 1905 (H. G. Dyar).
Green Cove Springs, March 4, 1905 (A. N. Caudell).
Magnolia Springs, March 3, 1905 (Dyar and Caudell).
Jacksonville, March 2, 1905 (Dyar and Caudell).
SOUTHERN GEORGIA: March 2, 1905 (Dyar and Caudell).

AËDES (TAENIORHYNCHUS) SOLLICITANS Walker.

Culex sollicitans WALKER, Ins. Saund., Dipt., p. 427, 1856.

A medium-sized blackish mosquito with ringed legs. Mesonotum bronzy yellow, dark brown at the sides, the pleura white scaled. Abdomen black, with basal and median longitudinal bands of pale yellow, the lateral spots, medianly on the segments, white; venter yellowish, with some black scales toward the tips of the segments. Proboscis with a white ring. Legs black, the femora yellowish below; knee spots white; tibiae with yellowish scales; tarsi black, the first tarsal with a yellowish central ring, the other joints white at base, broadly so on the hind pair. Wing scales black and white, evenly mixed.

The larvae live in salt tidal pools on the coast. The winter is passed in the egg state, and there are as many generations in the year as conditions permit. The adults are locally abundant, and in such cases travel many miles inland.

Distribution.—Coasts of Mexico, Gulf States, Antilles, Atlantic States to New England.

United States Records.

TEXAS: Sand Point, Matagorda Bay, July 30, 1901 (J. D. Mitchell).
Galveston, April 1, 1905 (J. C. Crawford).
Corpus Christi, March 22, 1905 (W. E. Hinds).
Victoria, June 13, 1904 (E. G. Hines).
Smith Point, November 7, 1918 (H. S. Barber).
LOUISIANA: Johnson's Bayou, July 26, 1906 (J. D. Mitchell).
New Iberia, October 15, 1904 (E. S. G. Titus).
MISSISSIPPI: Natchez, April, 1903 (A. Fleming).
Ocean Springs, November 22, 1902 (G. W. Herrick).
FLORIDA: St. Vincent Island, November 3, 1910 (W. L. McAtee).
Ramrod Key, November 7, 1918 (M. Kisliuk, jr.).
Palm Beach, March 14, 1905 (H. G. Dyar).
GEORGIA: Savannah, October 20, 1920 (S. F. Hildebrand).
SOUTH CAROLINA: McClellansville, October 11, 1906.
NORTH CAROLINA: Wilmington, July 22, 1918 (R. W. Leiby).
VIRGINIA: Paramore's Island, July 15, 1914 (H. G. Dyar).
MARYLAND: Piney Point, June 19, 1904 (T. Pergande).
DELAWARE: Rehoboth Beach, August 21, 1921 (H. G. Dyar).
NEW JERSEY: Cape May County, September 1, 1900 (B. I. Paschall).
PENNSYLVANIA: Philadelphia Neck, July 9 (H. Hornig).
NEW YORK: Bellport, August, 1901 (H. G. Dyar).
CONNECTICUT: East River, July 21, 1908 (C. R. Ely).
RHODE ISLAND: Weekapaug, July 20, 1904 (H. G. Dyar).
MASSACHUSETTS: Beverly, September 15, 1871 (E. Burgess).
NEW HAMPSHIRE: Durham, August 8 (H. G. Dyar).
MAINE: Lincolnville, August, 1908 (H. G. Dyar).

Subgenus FINLAYA Theobald.

AËDES (FINLAYA) TRISERIATUS Say.

Culex triseriatus SAY, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 12, 1823.
Finlaya (?) *nigra* LUDLOW, Can. Ent., vol. 37, p. 387, 1905.
Aëdes triseriatus hendersoni COCKERELL, Journ. Econ. Ent., vol. 11, p. 199, 1918.

A medium sized black mosquito with spotted abdomen. Mesonotum dark brown in the middle, the sides silvery white. Abdomen black dorsally, with silvery white lateral basal segmental spots; venter white scaled, the posterior segments black-banded at apices. Legs deep black, the femora silvery white below. Wing scales black.

The larvae live in the water in the holes in tree trunks, the winter being passed in the egg state. The females are severe biters, and though never abundant, are often troublesome in dry woods. The habits of the male have not been observed.

Distribution.—United States from the Gulf of Mexico to Montana and New England.

United States Records.

NEW HAMPSHIRE: Center Harbor, June 24, 1902 (H. G. Dyar).
MASSACHUSETTS: West Springfield, August 16, 1903 (F. Knab).
East Lee, July 26, 1921 (J. L. Webb).
CONNECTICUT: Fairfield County, August, 1910 (V. Howard).
NEW YORK: Ithaca, July (O. A. Johannsen).
NEW JERSEY: Lahaway, June 6, 1903 (J. T. Brakeley).
DISTRICT OF COLUMBIA: Washington, September 11, 1903 (J. Kotinsky).
MARYLAND: Herzog's Island, June 24, 1906 (F. Knab).
VIRGINIA: Bluemont, June 20, 1904 (F. C. Pratt).
NORTH CAROLINA: Charlotte, May 30, 1916 (H. P. Barret).
SOUTH CAROLINA: Columbia, August 1, 1906 (———).
GEORGIA: Atlanta, May 11, 1900 (W. B. Summerall).
FLORIDA: New Smyrna, March 21, 1905 (Dyar and Caudell).
Miami, March 8, 1905 (Dyar and Caudell).
MISSISSIPPI: Jackson, August 8, 1904 (H. S. Barber).
LOUISIANA: Mound, April 27, 1915 (D. L. Van Dine).
TEXAS: Victoria, October 5, 1904 (E. G. Hines).
MISSOURI: St. Louis, September, 1904 (A. Busck).
KANSAS: Lawrence, May (H. T. Martin).
IOWA: Ames, August 17, 1906 (H. J. Quayle).
KENTUCKY: Corbin, August 24, 1904 (H. S. Barber).
ARKANSAS: Helena, July 30, 1904 (H. S. Barber).
TENNESSEE: Chattanooga, August 20, 1904 (H. S. Barber).
INDIAN TERRITORY: Wister, July 7, 1904 (H. S. Barber).
MONTANA: Missoula, July 6, 1917 (H. G. Dyar).

Subgenus ECCULEX Felt.

AËDES (ECCULEX) VEXANS Meigen.

Culex vexans MEIGEN, Syst. Beschr. Eur. zweifl. Ins., vol. 6, p. 241, 1820.
Culex articulatus RONDANI, Bull. Soc. Ent. Ital., vol. 4, p. 30, 1872.

Culex malariae GRASSI, Rend. della R. Acad. dei Lincei, 1889.
Culex sylvestris THEOBALD, Mon. Culic., vol. 1, p. 406, 1901.
Culex nocturnus THEOBALD, Mon. Culic., vol. 3, p. 159, 1903.
Culex montcalmi BLANCHARD, Les Moust., p. 407, 1905.
Culicada nipponii THEOBALD, Mon. Culic., vol. 4, p. 337, 1907.
Culicada minuta THEOBALD, Mon. Culic., vol. 4, p. 338, 1907.
Culex stenoctrus THEOBALD, Mon. Culic., vol. 4, p. 395, 1907.
Culicada eruthrosops THEOBALD, Mon. Culic., vol. 5, p. 229, 1910.
Culex pseudostenoetrus THEOBALD, Mon. Culic., vol. 5, p. 343, 1910.
Aëdes euochrus HOWARD, DYAR, and KNAB, Mosq. No. & Cent. Am. & W. I., vol. 4, p. 716, 1917.

A medium-sized to small brown mosquito. Mesonotum, a little paler about antescutellar space. Abdomen black, with narrow white basal segmental bands, tending to be notched on dorsal line; lateral spots separated therefrom, quadrate and elongate; venter whitish scaled, with more or less distinct median blackish spots. Legs black, femora pale below; tarsi with very narrow white rings at the bases of the joints. Wing scales wholly dark.

The winter is passed in the egg state, the larvae hatching in early ground pools, but also later in the season whenever the pools are filled by rain or otherwise. However, there may not be more than one annual generation. The females are severe biters in woods and thickets, not frequenting the open. The males swarm after sunset, sometimes in very large groups. This is the commonest woods mosquito throughout the country, but it does not extend to high altitudes or the forests of the Canadian zone.

Distribution.—North America, from the Mexican Plateau to Canada, except on the Pacific coast and far north; Europe, northern Asia.

United States Records.

NEW HAMPSHIRE: Center Harbor, August 22, 1902 (H. G. Dyar).
MASSACHUSETTS: Beverly, June 2, 1876 (E. Burgess).
CONNECTICUT: Suffield (G. Dimmock).
NEW YORK: Tupper Lake, August 6, 1904 (H. G. Dyar).
NEW JERSEY: Summit, May 17, 1901 (La Rue Holmes).
MARYLAND: Plummer Island, August 19, 1902 (H. S. Barber).
DISTRICT OF COLUMBIA: Washington, August 17, 1900 (W. E. Hinds).
VIRGINIA: Del Ray, June 8, 1903 (F. C. Pratt).
NORTH CAROLINA: Charlotte, May 5, 1915 (H. P. Barret).
GEORGIA: Brunswick, March 6, 1911 (G. Coester).
FLORIDA: West Tampa, March 18, 1905 (H. G. Dyar).
New Smyrna, March 21, 1905 (Dyar and Caudell).
MISSISSIPPI: Corinth, August 11, 1904 (H. S. Barber).
LOUISIANA: Baton Rouge, November, 1902 (H. A. Morgan).
TEXAS: Dallas, September 15, 1905 (F. C. Pratt).
ARKANSAS: Scott, August 23, 1909 (J. K. Thibault).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
MISSOURI: St. Louis, September, 1904 (A. Busck).
ILLINOIS: Urbana, September 2, 1904 (F. Knab).

INDIANA: Lafayette, July 27, 1916 (J. J. Davis).
OHIO: Toledo, June 23, 1915 (C. Fox).
KANSAS: Kansas City, August 2, 1909 (A. N. Caudell).
WEST VIRGINIA: White Sulphur Springs, September 24, 1915 (F. Knab).
COLORADO: Denver, July 23, 1906 (E. P. Taylor).
UTAH: Elsinore, August 6, 1907 (E. S. G. Titus).
IDAHO: Sandpoint, July 3, 1917 (H. G. Dyar).
MONTANA: Laurel, July 16, 1917 (H. G. Dyar).
MINNESOTA: Moorhead, July 27, 1921 (H. G. Dyar).
NORTH DAKOTA: Devils Lake, July 20, 1921 (H. G. Dyar).
NEW MEXICO: Pecos, June 26 (Grabham and Cockerell).
ARIZONA: Tacna, April 15 (H. G. Hubbard).
CALIFORNIA: Bakersfield, April 3, 1918 (H. E. Woodworth).
Yosemite, May 14, 1916 (H. G. Dyar).

Subgenus AËDES Meigen.

AËDES (AËDES) CINEREUS Meigen.

Aëdes cinereus MEIGEN, Syst. Beschr. Eur. zweifl. Ins., vol. 1, p. 13, 1818.
Culex nigritulus ZETTERSTEDT, Dipt. Scand., vol. 9, p. 3459, 1850.
Aëdes fuscus OSTEN SACKEN, Bull. U. S. Geog. Surv., vol. 3, p. 191, 1877.
Culex pallidohirta GROSSBECK, Can. Ent., vol. 37, p. 359, 1905.
Culex pallidocephala THEOBALD, Mon. Culic., vol. 5, p. 612, 1910.

A rather small blackish mosquito. Mesonotum dark brown. Abdomen black, with a continuous lateral white line, but also with this line broken into spots and with more or less distinct basal segmental white bands; venter whitish scaled. Legs black, the femora whitish beneath. Wing scales all dark. The male has short palpi as in the female and is easily recognized thereby.

The winter is passed in the egg state, the larvae developing in early spring pools, but also, following rains, during the summer. The later emergencies are less numerous. The females are good biters in woods and thickets, not coming into the open. The males swarm after sunset in openings between willows and similar locations.

Distribution.—Northern North America and northern Europe, along the southern part of the forests.

United States Records.

NEW HAMPSHIRE: Center Harbor, August 5, 1902 (H. G. Dyar).
Dublin, May (A. Busck).
MASSACHUSETTS: Springfield, May 10, 1903 (F. Knab).
CONNECTICUT: Hartford, April 12, 1905 (F. Knab).
NEW YORK: Plattsburgh, April 20, 1905 (H. G. Dyar).
Watkins, May 11, 1920 (H. G. Dyar).
NEW JERSEY: Delair, June 21 (J. B. Smith).
ARKANSAS: Scott, April 14, 1909 (J. K. Thibault).
WISCONSIN: Madison (S. J. Holmes).
MINNESOTA: Clear River, June 15, 1914 (C. W. Howard).

MONTANA: Drummond, July 10, 1917 (H. G. Dyar).
WASHINGTON: Glacier, June, 1917 (H. G. Dyar).
OREGON: Prospect, May 25, 1921 (H. G. Dyar).
CALIFORNIA: Lakes Center Camp, July 1, 1920 (H. G. Dyar).
Tahoe City, May, 1921 (H. G. Dyar).
Fallen Leaf, June 9, 1916 (H. G. Dyar).
Yosemite, May 17, 1916 (H. G. Dyar).

AËDES (AËDES) VENTROVITTIS Dyar.

Aëdes ventrovittis DYAR, Ins. Ins. Mens., vol. 4, p. 84, 1916.

A small black mosquito. Head with the vertex clothed with long narrow white scales and black cleft ones, flat scales only at the sides in the female; the male has conspicuous flat black and white scales, but a broad channel of narrow ones on the vertex. Mesonotum olive gray, with a variously extensive median brown area, or two diffused brown lines. Abdomen black, with narrow white basal segmental bands, cleft on dorsal line and sometimes reduced to lateral spots; venter pale, with black bands at the apices of the segments and a median black line. Legs black, some whitish scales intermixed, especially below; femora narrowly pale below. Wing scales black.

This species is addicted to high mountains, appears early in the season and is soon gone. The adult bites with ferocity by day in mountain meadows and woods. The larva and breeding habits are unknown.

Distribution.—High mountains of California and probably Washington, though the specimens from the latter locality are so much damaged that the identification is not certain.

United States Records.

CALIFORNIA: Fallen Leaf, June 15, 1916 (H. G. Dyar).
Tahoe City, June 13, 1920 (H. G. Dyar).
Gold Lake, July 4, 1916 (W. B. Herms).
Camp Elwell, June 23, 1920 (H. G. Dyar).
WASHINGTON: Mount Rainier, August 3, 1906 (Dyar and Caudell).

Subgenus STEGOMYIA Theobald.

AËDES (STEGOMYIA) AEGYPTI Linnaeus.

Culex aegypti LINNAEUS, Hasselq. Palestina Reise, p. 470, 1762.
Culex argenteus POIRET, Journ. de Phys., vol. 30, p. 245, 1787.
Culex fasciatus FABRICIUS (not Müller, not Meigen), Syst. Antliat., p. 36, 1805.
Culex calopus MEIGEN, Syst. Beschr. Eur. Zweifl. Ins., vol. 1, p. 3, 1818.
Culex mosquito ROBINEAU-DESVOIDY, Mem. Soc. Nat. Hist. Paris, vol. 3, p. 407, 1827.
Culex frater ROBINEAU-DESVOIDY, Mem. Soc. Nat. Hist. Paris, vol. 3, p. 408, 1827.
Culex taeniatus WIEDEMANN, Ausser, Zweifl. Ins., vol. 1, p. 10, 1828.
Culex kounoupi BRULLÉ, Exp. Sci. do Moree, Zool., vol. 3, p. 289, 1836.

Culex annulitarsis MACQUART, WEBB, and BERTH, Hist. Nat. Iles Can., p. 2, Ins. p. 99, 1839.
Culex viridifrons WALKER, List Dipt. Brit. Mus., vol. 1, p. 3, 1848.
Culex excitans WALKER, List Dipt. Brit Mus., vol. 1, p. 4, 1848.
Culex formosus WALKER, List Dipt. Brit. Mus., vol. 1, p. 4, 1848.
Culex inexorabilis WALKER, List Dipt. Brit. Mus., vol. 1, p. 4, 1848.
Culex exagitans WALKER, Ins. Saund., Dipt., p. 430, 1856.
Culex impatibilis WALKER, Proc. Linn. Soc., Zool., vol. 4, p. 91, 1860.
Culex zonatipes WALKER, Proc. Linn. Soc., Zool., vol. 5, p. 229, 1861.
Culex bancrofti SKUSE, Proc. Linn. Soc. N. S. W., ser. 2, vol. 3, p. 1740, 1889.
Culex elegans FICALBI, Bull. Soc. Ent. Ital., vol. 21, p. 95, 1889.
Culex rossii GILES, Journ. Trop. Med., vol. 2, p. 64, 1899.
Stegomyia fasciata luciensis THEOBALD, Mon. Culic., vol. 1, p. 297, 1901.
Stegomyia fasciata queenslandensis THEOBALD, Mon. Culic., vol. 1, p. 297, 1901.
Stegomyia nigeria THEOBALD, Mon. Culic., vol. 1, p. 303, 1901.
Stegomyia fasciata persistans BANKS, Phil. Journ. Sci., vol. 1, p. 996, 1906.
Culex anguste-alatus BECKER, Mitt. Zool. Mus., Berlin, vol. 4, p. 79, 1908.
Culex albopalposus BECKER, Mitt. Zool. Mus. Berlin, vol. 4, p. 80, 1908.
Stegomyia fasciata atritarsis EDWARDS, Bull. Ent. Res., vol. 10, p. 129, 1920.

A small blackish mosquito with ringed legs and a lyre-shaped silvery marking on the mesonotum. Mesonotum dark brown, with two more or less distinct narrow pale yellowish median lines, and an outer silvery line, curving outward about the anterior edge of the disk and broadened, continued behind narrowly and straight. Abdomen black, with narrow basal segmentals white bands, the apical segments silvery also at tip; lateral spots white, on the last segments visible dorsally; venter whitish, with black bands on the segments posteriorly. Legs black, the femora pale beneath and with a silvery line in front; knee spots white; tarsi with white rings at the bases of the joints, the last hind tarsal all white. Proboscis black. Tips of palpi and tori white. Silvery scales on the clypeus. Wing scales black.

The species is domesticated, seeking houses and breeding in artificial containers. The adults bite by day or artificial light and are quiet in darkness. The males will swarm about a person sitting in a shaded place, but can not bite. The females are the vector of yellow fever. The species can not withstand frost and develops best at a rather high temperature.

This is the only species of the subgenus *Stegomyia* occuring in America, and apparently so occurs from having been introduced by commerce. Other species of the subgenus occur in the tropics of the Old World.

Distribution.—Tropical regions throughout the world. In summer is often carried into temperate regions and can persist till frost.

United States Records.

DISTRICT OF COLUMBIA: Washington, July 3, 1901 (J. Carroll).
VIRGINIA: Norfolk (R. Blue).

SOUTH CAROLINA: Columbia, September 12, 1908 (W. H. Sligh).
GEORGIA: Thomasville, October, 1905 (W. W. Jarrell).
FLORIDA: Miami, November 7, 1921 (G. F. Moznette).
LOUISIANA: New Orlenas, September 21, 1900 (H. A. Veazie).
MISSISSIPPI: Belzona, August 5, 1904 (H. S. Barber).
ARKANSAS: Helena, July 30, 1904 (H. S. Barber).
TENNESSEE: Knoxville, August 28, 1901 (S. R. Miller).
TEXAS: Dallas, June 27, 1904 (H. S. Barber).
ALABAMA: Tuscumbia, August 15, 1904 (H. S. Barber).
KENTUCKY: Lexington, October 19, 1901 (A. M. Miller).

Genus ORTHOPODOMYIA Theobald.

Orthopodomyia THEOBALD, Entom., vol. 37, p. 236, 1904.
Bancroftia LUTZ in Bourroul, Mosq. do Brasil, p. 59, 1904.
Pneumaculex DYAR, Proc. Ent. Soc. Wash., vol. 7, p. 46, 1905.

A small genus of wide distribution, all the species addicted to water in tree holes and similar locations, and on account of this restricted breeding habit, all the species are rare. Many of the adults are handsomely ornamented. Only a single species occurs in the United States.

ORTHOPODOMYIA SIGNIFER Coquillett.

Culex signifer COQUILLETT, Can. Ent., vol. 28, p. 43, 1896.

A medium-sized to small blackish mosquito. Mesonotum dark brown, marked with bluish silvery lines as follows: A line on each side about the margin; two central lines, running three-quarters back; two short posterior lines a little outside these; two short divergent lines on antiscutellar space. Abdomen black, with diffused pale basal segmental bands, widening on the sides; ventral segments narrowly pale at their bases, black outwardly. Legs black with pale scales, the femora pale beneath; tarsi with white rings involving both ends of the joints, rather broad on the hind legs. Wing scales black and whitish mixed, forming a white patch at the end of the cell.

The larvae live in tree holes. The eggs are placed on the sides of the cavity and are covered with a membrane. The adults rest on the trunks of trees, and could formerly be caught in the parks of Washington; but of late years the attention given to the trees has destroyed most of the breeding places. This species is close to *Orthopodomyia pulchripalpis* Rondani (=*albionensis* MacGregor) of Europe; but that has the two lines on antescutellar space joined in front to the median lines, forming a closed loop.

Distribution.—Southern States.

United States Records.

NEW JERSEY: New Brunswick (J. B. Smith).
MARYLAND: River View, August, 1905 (T. Pergande).
DISTRICT OF COLUMBIA: Washington, October 12, 1903 (T. Pergande).

VIRGINIA: Bluemont, July 27, 1906 (F. C. Pratt).
NORTH CAROLINA: Charlotte, August 3, 1915 (H. P. Barret).
SOUTH CAROLINA: Columbia, August 1, 1906 (A. C. Moore).
GEORGIA: Savannah, October 15, 1920 (V. H. Bassett).
MISSISSIPPI: Electric Mills (J. A. Le Prince).
ARKANSAS: Scott, August 24, 1909 (J. K. Thibault).
MISSOURI: St. Louis, September, 1904 (A. Busck).
INDIAN TERRITORY: Fort Sill (Army Medical Museum).
TEXAS: Kerrville, June 9, 1906 (F. C. Pratt).

Genus URANOTAENIA Lynch Arribálzaga.

Uranotaenia LYNCH ARRIBÁLZAGA, Rev. Mus. de La Plata, vol. 1, p. 375, 1891.
Anisochelomyia THEOBALD, Entom., vol. 38, p. 52, 1905.
Pseuduranotaenia THEOBALD, Journ. Econ. Biol., vol. 1, p. 33, 1905.
Pseudoficalbia THEOBALD, Trans. Linn. Soc. London, Zool., vol. 15, p. 89, 1912.

A small genus, mainly of tropical distribution. The larvae live in ground pools, and have a superficial resemblance to *Anopheles*, from the elongated black head, and the habit of lying flat in the water, although the larvae are not surface feeders. The adults are ornamented with lines of metallic blue scales.

KEY TO THE UNITED STATES SPECIES OF URANOTAENIA.

1. Legs with the tarsi all black ..... 2.
   Legs with last joint of hind tarsi white ..... **lowii Theobald.**
2. Mesonotum without median blue line ..... **anhydor Dyar.**
   Mesonotum with median blue line ..... 3.
3. Blue line ending at antescutellar area ..... **socialis Theobald.**
   Blue line running black to scutellum ..... **sapphirinus Osten Sacken.**

URANOTAENIA LOWII Theobald.

Uranotaenia lowii THEOBALD, Mon. Culic., vol. 2, p. 339, 1901.
Uranotaenia continentalis DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 187, 1906.
Uranotaenia minuta THEOBALD, Mon. Culic., vol. 5, p. 503, 1910.

A very small blackish mosquito. Mesonotum yellowish on the sides, a straight brown stripe in the middle; a brown spot over the root of the wing; a short line of bluish silvery scales in front of the wing on each side; patches of bluish silvery scales on pleura. Abdomen black, with apical segmental lateral elongate patches of silvery scales. Legs black, the femora pale below; knee spots white, sometimes inconspicuous. Apex of third, fourth, and fifth hind tarsals white. Wing scales black, a line of blue ones at base, running onto base of fifth vein.

The larvae develop in small ground pools. The adult is very small, and is not certainly known to bite. Specimens are seldom seen unless bred.

Distribution.—Tropical America, the Antilles, and Gulf coast of North America.

United States Records.

LOUISIANA: Baton Rouge, October 23, 1904 (J. W. Dupree).
Jackson Barracks, August (M. P. Chamberlain).
FLORIDA: Miami, December 10, 1921 (G. F. Moznette).

URANOTAENIA SAPPHIRINUS Osten Sacken.

Aëdes sapphirinus OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 2, p. 47, 1868.

A small blackish mosquito. Mesonotum brown, thinly scaled, a narrow line of metallic blue scales to the scutellum; a lateral line on each side, running to the wing. Abdomen black above; venter grayish. Legs black, femora pale beneath; tips of femora and tibiae with a pearly-white spot. Wing scales dark, a line of blue ones on basal half of fifth vein.

The winter is probably passed in the adult state. Eggs are laid in boat-shaped masses floating on the water. The females are not troublesome. I have no certain records of the biting. The habits of the males are unknown. A rare species, seldom seen unless bred.

Distribution.—Eastern United States from the Gulf of Mexico to northern New England.

United States Records.

NEW HAMPSHIRE: Center Harbor, July 27, 1902 (H. G. Dyar).
NEW YORK: Ithaca, October 2, 1906 (O. A. Johannsen).
Bellport, September 2, 1901 (H. G. Dyar).
MARYLAND: Plummer Island, September 6, 1906 (F. Knab).
VIRGINIA: Arlington, August 26, 1917 (H. G. Dyar).
SOUTH CAROLINA: Parr Shoals, August 18, 1915 (T. H. D. Griffitts).
FLORIDA: Jacksonville, March 23, 1905 (Dyar and Caudell).
Miami, December 15, 1921 (G. F. Moznette).
OHIO: Toledo, June 24, 1913 (C. Fox).
ARKANSAS: Scott, August 24, 1909 (J. K. Thibault).
MISSISSIPPI: Agricultural College, September 11, 1905 (W. V. Reed).
LOUISIANA: Mound, June 14, 1913 (A. H. Jennings).

URANOTAENIA SOCIALIS Theobald.

Uranotaenia socialis THEOBALD, Mon. Culic., vol. 2, p. 340, 1901.
Uranotaenia coquilletti DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 187, 1906.

A small blackish mosquito. Mesonotum brown, thinly clothed; a narrow blue line running back to antescutellar area; a line of blue scales in front of wing base; a blue patch on pleura. Abdomen black; often with a posterior white patch on fifth segment; venter grayish. Legs black, femora pale below; knee spot white, sometimes indistinct. Wing scales black; a silvery line at base and on base of fourth vein.

The larvae are said to occur in permanent pools, resting horizontally as usual in the genus. The adult differs from *sapphirinus*

only in the short interruption of the blue line across antescutellar space. The Jamaican specimens are so marked; but others from St. Thomas and Cuba have the line continuous. It is probably a local form of *sapphirinus* confined to Jamaica. The reported occurrance in Louisiana needs verification. No material is before me.

Distribution.—Island of Jamaica and Louisiana.

United States Records.

LOUISIANA: Baton Rouge (J. W. Dupree). (No material before me.)

URANOTAENIA ANHYDOR Dyar.

Uranotaenia anhydor DYAR, Proc. U. S. Nat. Mus., vol. 32, p. 128, 1907.

A small brown mosquito. Mesonotum brown, thinly clothed; a broken indistinct blue line along margin before wing insertion. Abdomen black; venter grayish. Legs black, knee spots narrowly white, femora pale below. Wing scales black, without silvery line.

The larvae live in permanent ponds, occurring only in the spring. The adults have never been taken except those bred. The species is rare.

Distribution.—Southern California.

United States Records.

CALIFORNIA: Sweetwater Junction, June 2, 1906 (Dyar and Caudell). San Diego, May 11, 1916 (H. G. Dyar).

Genus MEGARHINUS Robineau-Desvoidy.

Megarhinus ROBINEAU-DESVOIDY. Mem. Soc. d'Hist. Nat., Paris, vol. 3, p. 403, 1827.
Megarhina MACQUART. Dipt. Ecot., vol. 1, pl. 1, p. 32, 1838.
Toxorhynchites HOWARD, Mosq., pp. 155, 235, 240, 1901.
Ankylorhynchus LUTZ in Bourroul. Mosq. do Brasil, p. 53, 1904.
Lynchiella LAHILLE, Act. y Trab. 2 Cong. Med. Lat.-Amer., vol. 2, p. 13, 1904.
Worcesteria BANKS, Phil. Journ. Sci., vol. 1, p. 779, 1906.

A genus of large showy insects of tropical and subtropical distribution. The adults do not bite, the proboscis being curved and adapted to extract honey from flowers. The larvae feed entirely on other mosquito larvae which occur in tree holes and similar locations. The species of this genus should be classed as strictly beneficial to man. On account of the restricted habits the species are rare.

The genus has been divided into three subgenera on the structure of the palpi. The United States species belong to *Megarhinus* proper.

KEY TO THE UNITED STATES SPECIES OF MEGARHINUS.

1. Male with white on front tarsi; female with joints 2, 3, 4 of front and mid tarsi white marked ..... rutila Coquillett.
   Male with no white on front tarsi: female with joints 2, 3 of front and mid tarsi white marked ..... septentrionalis Dyar and Knab.

MEGARHINUS RUTILA Coquillett.

Megarhinus rutila COQUILLETT, Can. Ent., vol. 28, p. 44, 1896.

A very large mosquito with bent proboscis, metallic green and yellow. Mesonotum dark brown, with a border of light green scales and a line through the center. Abdomen metallic green or blue with a broad white stripe along the sides. Palpi of the female three-quarters as long as the proboscis, of the male longer, the last joint long and acuminate. Legs black with blue reflection, brassy yellow below, knee spots white; tarsi of the female on front and middle legs with apex of first joint and all of second, third, and fourth white, hind legs with apex of third, fourth, and all but tip of fifth white; in the male, front and middle legs with second joint and basal two-thirds of third white, hind legs with fourth and basal two-thirds of fifth white. Wings smoky, the scales dark.

The life history and habits are unknown and the larva is undescribed. The species is very rare and females very difficult to distinguish from the following better known species.

Distribution.—Florida and extreme south.

United States Records.

FLORIDA: Georgiana (W. Wittfeld).
ALABAMA: Empire, August, 1913 (W. S. Sowell) (female only).
MISSISSIPPI: Sibley (A. Fleming) (female only).

MEGARHINUS SEPTENTRIONALIS Dyar and Knab.

Megarhinus septentrionalis DYAR and KNAB, Smith. Misc. Colls., Quart. Iss., vol. 48, p. 247, 1906.
Megarhinus herrickii THEOBALD, Entom., vol. 39, p. 241, 1906.

A very large mosquito with bent proboscis, metallic green and yellow. Mesonotum dark brown, with a border of light green scales and a line through the center. Abdomen metallic green or blue with a broad white stripe along the sides. Palpi of the female three-quarters as long as the proboscis, of the male longer, the last joint long and acuminate. Legs black with blue reflection, brassy yellow below; knee spots white; tarsi of the female of front and mid legs with second and third and all but apex of fourth joints white, hind tarsi with extreme apex of third, all of fourth, and all but tip of fifth white; in male mid tarsi with second and basal two-thirds of the third joint white on outer side, hind legs with fourth joint entirely white, and base of fifth. Wings smoky brown, the scales black.

The larvae live in the water in holes in trees and feed exclusively upon other mosquito larvae, namely, *Aëdes triseriatus*, *Orthopodomyia signifer*, and perhaps *Anopheles barberi*. The females fre-

quent flowers and suck honey. The males rest on the leaves of a selected plant, such as a poison ivy vine on a tree, forming a stationary swarm. Both sexes are active in bright daylight.

Distribution.—Southern States.

United States Records.

MARYLAND: Plummer Island, June 24, 196 (A. K. Fisher).
DISTRICT OF COLUMBIA: Washington, September 9, 1901 (J. Kotinsky).
VIRGINIA: Great Falls, September 17, 1906 (T. Pergande).
Skyland (W. Pollock).
WEST VIRGINIA: Morgantown, June 10, 1898 (A. D. Hopkins).
NORTH CAROLINA: Hartsville (J. L. Coker).
GEORGIA: Augusta, September 10, 1909 (W. V. Reed).
TENNESSEE: Knoxville, April 13, 1907 (Morgan and Cotton).
MISSOURI: St. Louis, October 4, 1904 (A. Busck).
ARKANSAS: Scott, July 24, 1908 (J. K. Thibault).
INDIAN TERRITORY: Ringo, (A. N. Caudell).
MISSISSIPPI: Agricultural College, September 26, 1905 (W. V. Reed).
LOUISIANA: Baton Rouge (J. W. Dupree).
TEXAS: Dallas, August 13, 1906 (Crawford and Pratt).

Genus ANOPHELES Meigen.

Anopheles MEIGEN, Syst. Beschr. Eur. Zweifl. Ins., vol. 1, p. 10, 1818.
Cyclolepteron THEOBALD, Mon. Culic., vol. 1, p. 205, 1901.
Cyclolepidopteron BLANCHARD, C. R. Soc. Biol., vol. 53, p. 1046, 1901.
Grassia THEOBALD (not Fisch), Journ. Trop. Med., vol. 5, p. 181, 1902.
Myzomyia BLANCHARD, C. R. Soc. Biol., vol. 54, p. 795, 1902.
Stethomyia THEOBALD, Journ. Trop. Med., vol. 5, p. 182. 1902.
Howardia THEOBALD (not Dalla Torre). Journ. Trop. Med., vol. 5, p. 182. 1902.
Pyretophorus BLANCHARD, C. R. Soc. Biol., vol. 54, p. 795, 1902.
Rossia THEOBALD (not Bonaparte, not Owen), Journ. Trop. Med., vol. 5, p. 183, 1902.
Myzorhynchus BLANCHARD, C. R. Soc. Biol., vol. 54, p. 795, 1902.
Laverania THEOBALD (not Grassi and Feletti), Journ. Trop. Med., vol. 5, p. 183, 1902.
Nyssorhynchus BLANCHARD, C. R. Soc. Biol., vol. 54, p. 795, 1902.
Cellia THEOBALD, Journ. Trop. Med., vol. 5, p. 183, 1902.
Arribalzagia THEOBALD, Mon. Culic., vol. 3, p. 81, 1903.
Aldrichia THEOBALD, Mon. Culic., vol. 3, p. 353, 1903.
Lophosceiomyia, THEOBALD, Entom., vol. 37, p. 12, 1904.
Lophomyia GILES, Journ. Trop. Med., vol. 7, p. 366, 1904.
Kerteszia THEOBALD, Ann. Mus. Nat. Hung., vol. 53, p. 66, 1905.
Nototricha COQUILLETT, U. S. Dept. Agr., Bur. Ent., Tech. Ser., vol. 11, p. 13, 1906.
Coelodiazesis DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 14, p. 177, 1906.
Feltinella THEOBALD, Mon. Culic., vol. 4, p. 56, 1907.
Myzorhynchella THEOBALD, Mon. Culic., vol. 4, p. 78, 1907.
Manguinhosia CRUZ, Um. Nov. Gen. Braz. s.-f. Anoph., 1907.
Neocellia ROTHWELL, Entom., vol. 40, p. 34, 1907.
Neocellia THEOBALD (not Rothwell), Mon. Culic., vol. 4, p. 111, 1907.

Pseudomyzomyia THEOBALD, Mon. Culic., vol. 4, insert slip, 1907.
Calvertia LUDLOW (not Warren), Can. Ent., vol. 41, p. 22, 1909.
Calvertina LUDLOW, Can. Ent., vol. 41, p. 234, 1909.
Neomyzomyia THEOBALD, Mon. Culic., vol. 5, p. 29, 1910.
Aldrichinella THEOBALD, Mon. Culic., vol. 5, p. 77, 1910.
Christophersia JAMES, Paludism, vol. 1, p. 33, 1910.
Nyssomyzomyia JAMES, Paludism, vol. 1, p. 37, 1910.
Neostethopheles JAMES, Rec. Ind. Mus., vol. 4, p. 98, 1910.
Patagiamyia JAMES, Rec. Ind. Mus., vol. 4, p. 98, 1910.
Dactylomyia NEWSTEAD and CARTER, Ann. Trop. Med. & Par., vol. 4, p. 377, 1910.
Proterorhynchus BRÈTHES, Bol. Ins. Et. y Pat. Veg., vol. 1, p. 14, 1912.
Cyclophorus EYSELL, Arch. f. Schiffs.- u. Trop. Hyg., vol. 16, p. 421, 1912.
Dendropaedium DYAR and KNAB, Ins. Ins. Mens., vol. 6, p. 141, 1918.

A genus of world-wide distribution, especially in tropical and warm temperate regions, rare or absent in the North. The larvae are surface feeders, occurring mostly in ground pools of a permanent character, some in running water, and a few species restricted to tree holes or leaves of Bromeliaceae. The larvae are easily told by the short air tube. They lie attached to the surface film. The adults fly principally in the dusk. Some species freely enter houses. The hibernation is as adult. Most of the species of *Anopheles* transmit malaria, and are consequently of great economic importance.

The following subgenera, based on characters of the male genitalia, are suggested for the United States species:

1. Aedoeagus slender, with spines at tip----------Subgenus **Anopheles** Meigen.
   Aedoeagus without spines at tip---------- 2.
2. Aedoeagus broad, irregular, within a very large conical membrane with wrinkled walls----------Subgenus **Nyssorhynchus** Blanchard.
   Aedoeagus small, slender, free---------- 3.
3. Basal lobe conical with three setae------Subgenus **Proterorhynchus** Brèthes.
   Basal lobe elliptical with tuft of long flat hairs.
   Subgenus **Coelodiazesis** Dyar and Knab.

KEY TO THE UNITED STATES SPECIES OF ANOPHELES.

1. Tarsi marked with white----------**albimanus** Wiedemann.
   Tarsi without white markings---------- 2.
2. Wings with white spots---------- 3.
   Wings with black spots or none---------- 5.
3. Wings with a white spot at outer third costa---------- 4.
   Wings without this spot----------**crucians** Wiedemann.
4. Palpi marked with white; third vein extensively white in the middle.
   pseudopunctipennis Theobald.
   Palpi wholly black; third vein wholly black----------**punctipennis** Say.
5. Wings with black spots, usually distinct---------- 6.
   Wings with indistinct black spots or none, usualy absent---------- 7.
6. Wing with a coppery spot at apex on fringe----------**maculipennis** Meigen.
   Wing-fringe black at apex as elsewhere----------**quadrimaculatus** Say.
7. Mesonotum rounded, but little elongate----------**barberi** Coquillett.
   Mesonotum distinctly elongate---------- 8.

8. Palpi of female with whitish rings at bases of joints------walkeri Theobald.
Without distinct white rings on palpi; body blackish; hairs of mesonotum dark brown----------atropos Dyar and Knab.

Subgenus NYSSORHYNCHUS Blanchard.

ANOPHELES (NYSSORHYNCHUS) ALBIMANUS Wiedemann.

Anophcles albimanus WIEDEMANN, Dipt. Exot., p. 10, 1821.
Anopheles cubensis AGRAMONTE, El Prog. Med., Trop., vol. 1, p. 17, 1900.
Anopheles argyrotarsis albipes THEOBALD, Mon. Culic., vol. 1, p. 125, 1901.
Anopheles dubius BLANCHARD, Les Moust., p. 205, 1905.
Anopheles tarsimaculata GOELDI, Os Mosq. no Pará, p. 133, 1905.
Anopheles gorgasi DYAR and KNAB, Journ. N. Y. Ent. Soc., vol. 15, p. 198, 1907.

A medium-sized black *Anopheles*, the tip of hind tarsi white with a black spot on last joint. Mesonotum shining gray, a small black spot on each side and a larger one at posterior end. Abdomen dark gray, the segments with lateral projecting tufts of scales. Legs blackish, the fore tarsi with white rings at apices of the first three joints; hind legs with apex of second, third to fifth joints white, a black mark on the fifth joint. Wings with black and yellowish scales, two large yellowish spots outwardly on costa; other veins with small dark spots alternating with pale scales. Palpi long, dark, last joint and base of penultimate one white. Sometimes the last two joints of palpi wholly white or nearly so (*tarsimaculata*).

The larvae prefer stagnant water, exposed to the sun, with growth of algae. They occur readily in water of artificial production and readily associate with habitations. This is the principal vector of malaria in tropical America.

Distribution.—Tropical America, the Antilles, southern Florida. The forms *albimanus* and *tarsimaculata* have not the same distribution; but they intermix in Panama and elsewhere, and probably represent races of one species.

United States Records.

FLORIDA: Key West (C. H. Gardner).

Subgenus ANOPHELES Meigen.

ANOPHELES (ANOPHELES) PUNCTIPENNIS Say.

Culex punctipennis SAY, Journ. Acad. Nat. Sci. Phila., vol. 3, p. 9, 1823.
Culex hyemalis FITCH, Amer. Journ. Agr. Sci., vol. 5, p. 281, 1847.
Anopheles perplexens LUDLOW, Can. Ent., vol. 39, p. 267, 1907.

Mesonotum elongate, hairy, broadly whitish in the integument in the middle, dark brown on the sides. Abdomen hairy, brown, the apices of the segments darker, in the integument. Legs long and slender, blackish; tips of femora and tibiae with small white spots.

Wings with scales black except in certain spots as follows: A large one at outer third of costa and a smaller one at apex, both involving second vein; one on third vein in the cell, on the stem and middle of both forks; at base and middle of fifth vein.

The larvae are surface feeders in all sorts of water puddles, often in small or temporary rain puddles, but also in permanent water. The males swarm after sunset. A dangerous malaria carrier.

Distribution.—United States from Mexico northward, except the dry central region, reaching Canada at both coasts.

United States Records.

MAINE, Weld, August, 1910 (H. G. Dyar).
NEW HAMPSHIRE: Center Harbor, July 17, 1902 (H. G. Dyar).
NEW YORK: Plattsburg, August 9, 1901 (H. G. Dyar).
MASSACHUSETTS: West Springfield, May 14, 1903 (F. Knab).
PENNSYLVANIA: West Fairview, August 18, 1900 (H. G. Bashore).
NEW JERSEY: Delair, August 20, 1901 (W. P. Seal).
MARYLAND: Jackson's Island, July 29 (H. S. Barber).
WEST VIRGINIA: Huntington, November 11, 1902 (A. D. Hopkins).
VIRGINIA: St. Elmo, May 12 (F. C. Pratt).
GEORGIA: Atlanta, September 5, 1902 (C. A. Smith).
MISSISSIPPI: Corinth, August 14, 1904 (H. S. Barber).
ARKANSAS: Scott, September 24, 1909 (J. K. Thibault, jr.).
ILLINOIS: Urbana, August 8, 1904 (F. Knab).
KENTUCKY: Corbin, August 29, 1904 (H. S. Barber).
KANSAS: Onaga, October 8 (F. F. Crevecoeur).
TEXAS: Paris, April 26, 1904 (C. T. Brues).
CALIFORNIA: Sweetwater Junction, June 2, 1906 (Dyar and Caudell).
Stanford University, (I. McCracken).
OREGON: Portland, July 30, 1906 (Dyar and Caudell).
WASHINGTON: Ashford, August 5, 1906 (Dyar and Caudell).

ANOPHELES (ANOPHELES) QUADRIMACULATUS Say.

Anopheles quadrimaculatus SAY, Keat. Narr. Exp. St. Peter's Riv., vol. 2, p. 356, 1824.
Anopheles guttulatus HARRIS, Hitch. Rep. Geol. Min. Bot. Zool. Mass., p. 595, 1836.
Anopheles annulimanus VAN DER WULP, Tidj. voor Ent., vol. 10, p. 129, 1867.

A medium-sized blackish *Anopheles* with black-spotted wings. Mesonotum elongate, hairy, broadly whitish in the integument in the middle, dark brown on the sides. Abdomen with light hairs, brown, the apices of the segments darker, in the integument. Legs long and slender, blackish; tips of femora and tibiae whitish. Wings with the scales black, forming four dark spots by being thickly placed as follows: Base of second vein in the cell; on the cross veins and forks of second and fourth veins.

The larvae are surface feeders in water puddles, especially permanent water connected with rivers. The habits of the males have

not been observed. A dangerous malaria carrier, permitting the evolution of all three species.

Distribution.—Mexico to New England, east of the Rocky Mountains.

United States Records.

NEW HAMPSHIRE: Berlin Falls, August 9, 1868 (F. G. Sanborn).
MASSACHUSETTS: Westfield, August 23, 1903 (F. Knab).
CONNECTICUT: Pine Orchard, July 19, 1903 (F. H. Hart).
NEW YORK: Bellport, August 27, 1901 (H. G. Dyar).
PENNSYLVANIA: West Fairview, August 18, 1900 (G. B. Bashore).
MARYLAND: Chesapeake Beach, July 4, 1903 (A. Busck).
VIRGINIA: St. Elmo, May (F. C. Pratt).
FLORIDA: Lake Okeechobee, March, 1906 (J. H. Egbert).
MISSISSIPPI: Belzona, August 5, 1904 (H. S. Barber).
TENNESSEE: Rives, July 27, 1904 (H. S. Barber).
LOUISIANA: New Orleans, May, 1904 (H. S. Barber).
TEXAS: Dallas, September 14, 1905 (C. E. Riggs).
COLORADO: Hotchkiss, August 20, 1911 (G. P. Weldon).
UTAH: Logan, October 15, 1913 (C. T. Vorhies).
ARKANSAS: Little Rock, July 11, 1904 (H. S. Barber).
MISSOURI: St. Louis, June, 1904 (A. Busck).
INDIANA: Lake Maxinkuckee (W. B. Evermann).
WISCONSIN: Saxeville, June 17, 1909 (B. K. Miller).

ANOPHELES (ANOPHELES) MACULIPENNIS Meigen.

Anopheles maculipennis MEIGEN, Syst. Beschr. Zweifl. Ins., vol. 1, p. 11, 1818.
Anopheles occidentalis DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 159, 1906.
Anopheles lewisi LUDLOW, Psyche, vol. 27, p. 74, 1920.
Anopheles selengensis LUDLOW, Psyche, vol. 27, p. 77, 1920.

A medium-sized blackish *Anopheles* with black-spotted wings. Mesonotum elongate, hairy, broadly whitish in the integument in the middle, dark brown on the side. Abdomen with light hairs, brown, the apices of the segments darker in the integument. Legs long and slender, blackish; tips of femora and tibiae whitish. Wings with the scales black, forming four dark spots by being thickly placed as follows: base of second vein in the cell; on the cross veins and forks of second and fourth veins. Tip of the wing with a brassy reflection in the fringe.

The larvae are surface feeders in all sorts of water puddles, preferring permanent water. The habits of the males have not been observed in America. The difference between this and *quadrimaculatus* is slight in coloration, but the male genitalia show good characters. This form has lately been shown to be identical with *maculipennis* Meigen, of Europe. It is evidently a good malaria carrier, although there is no record of experiments carried on with this form under the American name *occidentalis*.

Distribution.—Western United States except the moist northern Pacific strip, eastward through Canada to northern Maine; Europe and Asia.

United States Records.

CALIFORNIA: Sweetwater Junction, June 12, 1906 (Dyar and Caudell).
Fresno, April 4 (E. A. Schwarz).
Sisson, July, 1906 (Dyar and Caudell).
OREGON: Klamath Falls, July 27, 1906 (Dyar and Caudell).
NEVADA: Steamboat Springs, August 19, 1915 (H. G. Dyar).
UTAH: Lehi, September 8, 1905 (W. A. Hooker).
ALASKA: Fort Gibbon, June 6, 1907 (Army Medical Museum).
MAINE: Weld, July 25, 1910 (H. G. Dyar).
Norcross, July, 1914 (Z. P. Dyar).

ANOPHELES (ANOPHELES) WALKERI Theobald.

Anopheles walkeri THEOBALD, Mon. Culic., vol. 1, p. 199, 1901.

A medium-sized blackish *Anopheles*, without conspicuous wing spots. Palpi with small white rings at the bases of the joints. Mesonotum dark brown, uniformly colored. Abdomen blackish, with brown hairs. Legs long and slender, black, the femora pale below; small white spots at tips of femora and tibiae. Wing scales black, not forming distinct spots, though sometimes slight ones at the bases and forks of second and fourth veins.

The larvae inhabit water formed by overflows from rivers, which occasionally go dry. The habits of the males are unknown. It has not been demonstrated whether this species carries malaria.

Distribution.—Eastern North America.

United States Records.

MICHIGAN: Camp Custer, Battle Creek (Army Medical Museum).
MASSACHUSETTS: Westfield, August 23, 1903 (F. Knab).
DISTRICT OF COLUMBIA: Washington, June 10, 1911 (F. Knab).
Chain Bridge, October 15, 1906 (T. Pergande).
VIRGINIA: Addison, November 7, 1909 (A. N. Caudell).
Long Bridge, September 12, 1916 (A. H. Jennings).
ARKANSAS: Little Rock (J. K. Thibault).
LOUISIANA: Terrebonne, March 29, 1901 (G. E. Beyer).

ANOPHELES (ANOPHELES) ATROPOS Dyar and Knab.

Anopheles atropos DYAR and KNAB, Proc. Biol. Soc. Wash., vol. 19, p. 160, 1906.

A rather small blackish *Anopheles* with unspotted wings. Mesonotum elongate, deep brown. Abdomen blackish in the integument, with dark hairs. Legs and palpi entirely dark, the latter with traces of paler markings at the articulations. Wing scales entirely dark, not forming spots.

Little is known of this form, and nothing of the male or life history. Specimens were taken by Dr. M. J. White biting between four and five in the morning. Malaria relation unknown.

Distribution.—Coasts of Florida and Louisiana.

United States Records.

FLORIDA KEYS (H. Byrd).
LOUISIANA: Buras, July 17, 1918 (M. J. White).

ANOPHELES (ANOPHELES) CRUCIANS Wiedemann.

Anopheles crucians WIEDEMANN, Ausser. Zweifl. Ins., vol. 1, p. 12, 1828.

A medium-sized blackish *Anopheles* with mottled wings. Mesonotum grayish, with traces of dark spots, one especially on scutellum seen in oblique light. Abdomen blackish, with light brown hairs. Legs black with pale knee spots. Wings with a small yellowish white spot at apex and fringe; other scales mostly black, forming spots at the bases of the forked cells and three on the sixth vein, separated by pale scales. The palpi of the female have the last joint whitish and a ring at base of penumtimate joint.

The larvae live in ground pools, especially near the coast. The adults are very fond of entering dwellings. The species is a dangerous carrier of malaria.

Distribution.—Southeastern United States from New York to Mexico; Cuba and Jamaica.

United States Records.

NEW YORK: Bellport, October 13, 1901 (H. G. Dyar).
MARYLAND: Chesapeake Beach, July 4, 1903 (A. Busck).
DISTRICT OF COLUMBIA: April 27, 1893 (T. Pergande).
VIRGINIA: Lake Drummond, October 29, 1906 (H. S. Barber).
NORTH CAROLINA: Hendersonville, March 24, 1913 (W. B. W. Howe).
SOUTH CAROLINA: Columbia, September 12 (W. H. Sligh).
GEORGIA: Waycross, August 30, 1916 (R. H. von Ezdorf).
FLORIDA: Miami, November 11, 1921 (G. F. Moznette).
MISSISSIPPI: Biloxi, December 6, 1902 (J. Brodie).
LOUISIANA: New Orleans, June 28, 1900 (H. A. Veazie).
TEXAS: Galveston, September 30, 1901 (I. T. Moore).

Subgenus PROTERORHYNCHUS Brèthes.

ANOPHELES (PROTERORHYNCHUS) PSEUDOPUNCTIPENNIS Theobald.

Anopheles pseudopunctipennis THEOBALD, Mon. Culic., vol. 2, p. 305, 1901.
Anopheles franciscanus MCCRACKEN, Ent. News, vol. 15, p. 12, 1904.
Anopheles peruvianus TAMAYO AND GARCIA, Los Ag. de Huac., Mem. Munc. Lima, App., p. 35, 1907.
Proterorhynchus argentinus BRÈTHES, Bol. Inst. Ent. y Pat. Veg., vol. 1, p. 15, 1912.
Anopheles tucumanus LAHILLE, An. Mus. Nat. B. A., vol. 23, p. 253, 1912.

A medium-sized blackish *Anopheles* with white-spotted wings. Mesonotum broadly whitish in the middle, dark brown on the sides. Abdomen gray, with pale hairs. Legs black, knee spots yellowish white. Wings spotted black and white; costa black with three white patches; third vein broadly white in the middle. Palpi of female with white rings at the bases of the joints.

The larvae occur in ground pools and edges of streams. The adult is a dangerous malaria carrier. It greatly resembles *punctipennis*, but is not really closely allied thereto.

Distribution.—Tropical and subtropical America, southwestern United States to northern Argentina.

United States Records.

CALIFORNIA: Stanford University (I. McCracken).
Stockton (H. J. Quayle).
Laguna Beach, July 25, 1918 (W. E. Hilton).
San Diego, May 19, 1916 (H. G. Dyar).
NEW MEXICO: Las Vegas Hot Springs, 1902 (T. D. A. Cockerell).
TEXAS: Devils River, May 5, 1907 (F. C. Pratt).
Brownsville, May 31, 1904 (H. S. Barber).

Subgenus COELODIAZESIS Dyar and Knab.

ANOPHELES (COELODIAZESIS BARBERI Coquillett.

Anopheles barberi COQUILLETT, Can. Ent., vol. 35, p. 310, 1903.

A rather small blackish *Anopheles* with unspotted wings. Mesonotum brown with dark hairs. Abdomen black, the hairs dark. Legs black, knee spots pale, but not contrasted. Wings uniformly black scaled without trace of spotting. Palpi of the female entirely dark.

The larvae live in the water in tree holes, which occur in otherwise dry forests, so that this species often bites where ground-breeding mosquitoes are absent. This species has not been tested in the malaria-carrying relation; but its close European relative, *plumbeus* Haliday and Stephens, is said to be capable of transmission, but from its habitat seldom has the opportunity.

Distribution.—Southeastern United States.

United States Records.

MARYLAND: Plummer Island, August 17, 1905 (H. S. Barber).
VIRGINIA: Bluemont, July 29, 1904 (F. C. Pratt).
NORTH CAROLINA: Tryon (H. G. Dyar).
SOUTH CAROLINA: Columbia, August 1, 1906 (A. C. Moore).
MISSOURI: St. Louis, August, 1904 (A. Busck).
MISSISSIPPI: Agricultural College, October 15, 1905 (G. W. Herrick).
ARKANSAS: Scott, October 2, 1908 (J. K. Thibault).

INDEX.

[This index has been prepared in the editorial office of the Federal Bureau of Entomology and includes all generic, subgeneric, specific, and subspecific names included in the text. Valid generic names are in **boldface** type; valid specific names in roman; synonyms in *italics;* species group names in SMALL CAPITALS.]