

iii, p. 195). Without going into the homology of the parts in the Culicines and Deinoceratines at the moment, as I will deal with them later, it is obvious that the parts called harpagones in *Mansonia* really correspond with the basal lobes of *Culiseta* and others. Therefore the table, beginning with dichotomy 5, can be amended as follows, bringing in the relationship of the New World and Old World divisions of *Aedes* as here defined:

5. Harpagones present	6
Harpagones absent	8
6. Apical appendages of harpagones multiple.....	<i>Psorophora</i>
These appendages single.....	7
7. A fringe of broad scales on inner edge of side piece....	<i>Haemagogus</i>
No such fringe present.....	<i>Aedes</i> (New World stock)
8. Side pieces without a conical basal lobe, open within,	
<i>Aedes</i> (Old World stock)	
Side pieces with such a lobe.....	9
9. Basal lobe with a single terminal rod, often situated at the end of a process	<i>Mansonia</i>
Basal lobe conical, with several terminal setæ.....	<i>Megarhinus</i> , <i>Orthopodomyia</i> , <i>Culiseta</i> , <i>Culicella</i> , <i>Climacura</i>

A REVISION OF THE AMERICAN SPECIES OF CULEX ON THE MALE GENITALIA

(*Diptera*, *Culicidæ*)

By HARRISON G. DYAR

On a previous page I gave some notes on the relationship of the species of *Aedes* as shown by the male genitalia. In a review of the other genera with the object of ascertaining the origin of *Culex*, it appears that the *Anopheles* are very distinct. In these the ædœagus is present, simple or with a crown of spines or flattened appendages, and there are no basal chitinous organs whatever. The side pieces are slightly modified, bearing certain stout spines or with small basal lobes; but we find no homology with *Culex* and must leave the *Anopheles* aside. In *Aedeomyia*, the ædœagus has disappeared, and there is a basal chitinous structure, composed of paired

rods, topped by a single piece. This has been called the uncus, which name we will retain. In the middle of the side piece is a slight lobe, bearing about five stout spines crowded together, situated at the apex of a basal hollow in which the uncus rests. In *Uranotenia* the next step is seen. A second basal organ is present, paired and opposed to the unci, which have now lost the single terminal piece and appear as paired organs. The new organs have been called the harpes; but they are not homologous with those of *Culex* and others; *Uranotenia* is clearly a side line. We mention the harpes here to show the early stage of a second basal organ. *Culiseta* is more directly in the line we are following. Here the unci form a basal cylinder or cone, composed of paired parts, but wrapped into a single organ by the revolute margins. True harpes are present in *Culiseta*, but they are more or less modified. A simpler condition is found in *Megarhinus*. Here the organs are elliptical, concave, more heavily chitinized on one side, the tip dentate. The side pieces have the basal area pouch-like, hollowed to receive the basal organs, the tip of the pouch forming a slight lobe with a group of three stout hairs. From this point *Orthopodomyia* and *Mansonia* originated; but they do not lie in the direct line of *Culex*, one being a generalized form parallel to *Culiseta*, the other an offshoot. *Climacura* falls here, the genitalia having the unci undivided. It is interesting, however, as the larva has become practically a true *Culex*. In *Culicella*, the unci have begun to divide, the harpes remaining as in *Culiseta*. The larvæ of *Culicella* have not attained the *Culex* type, but are still much as in *Culiseta*. The next link in the chain is shown in *Jamesia*, an Old World group in which the larvæ are predacious and, therefore, specially modified. The harpes have assumed the *Culex* type, with a crown of spines, and with this the genus *Culex* may be said properly to begin. *Lutzia* goes a step farther, the second plate of the unci being toothed, whereas it is perfectly simple in *Jamesia*. The side pieces have a process at the apex of the basal hollow, carrying three stout spines; the harpes have a crown of spines and a curved basal arm and the unci are divided into two plates.

The following tables separate first the genera of the tribe Culicini, then the subgenera of *Culex* and lastly the species of *Culex* as far as the American species are known to me in the male genitalia.

In the monograph¹ the parts called the "harpagones" (vol. iii, p. 224, dichotomy, 3 *et seq.*) are here identified as unci. I reserve the name harpagones for the structures so denominated in *Aedes*. I have omitted *dyari* and *melanurus*, commonly classed in *Culex*, as I have separated them generically under the headings *Culicella* and *Climacura* respectively.

It may be remarked that the tribe Sabethini are not distinguishable from the Culicini on genitalic characters (compare the monograph, vol. iii, p. 21, 1915). The lowest members, *Joblotia* and *Lesticocampa*, have genitalia essentially as in *Megarhinus* and *Orthopodomyia*, the unci only being somewhat modified. In the higher genera, the primitive condition of the basal parts remains; but the side pieces and clasp-filaments are greatly modified, the hollow basal lobes of the former having entirely disappeared. The two series are quite distinctly separated by their mode of evolution.

TABLE OF GENERA OF THE TRIBE CULICINI

1. <i>Ædæagus</i> present; basal membrane long, conical, divided; no basal chitinated appendages.....	<i>Anopheles</i> ²
<i>Ædæagus</i> absent; basal membrane slight; basal chitinated organs present	2
2. Unci only present, undivided, capitate.....	<i>Aedeomyia</i>
Unci and harpes present, in two pairs.....	3
3. Unci separated, hooked; harpes slender, columnar, opposed to the unci	<i>Uranotania</i>
Unci columnar or divided; harpes broad, concave, the tips toothed or spinose, parallel to the unci.....	4
4. Side piece with a hollow basal lobe tipped by stout setæ, modified in the higher forms, but the tip persisting as an appendage of the side piece, bearing spines, etc.....	6
Side piece without a hollow basal lobe, devoid of lobes, except in the higher forms, where lobes appear secondarily, but not hollow	5

¹Howard, Dyar and Knab, The Mosquitoes of North and Central America and the West Indies, iii, 1915.

²*Coelodiazesis* is not distinguishable.

5. Adjacent basal lobe, if present, small and setose, never produced with a single terminal spine.....*Aedes* (Old World stock)
Adjacent basal lobe developed into an harpago,
Aedes (New World stock)
6. Unci undivided 7
Unci divided into two or more outwardly directed plates..... 11
7. Basal lobe conical with several terminal setæ..... 8
Basal lobe with a single stout rod, often produced.....*Mansonia*²
8. Harpes very long, prominent; unci long, pointed.....*Megarhinus*
Harpes and unci moderate..... 9
9. Unci membranous, paired, with an outwardly directed basal chitinization*Climacura*
Unci cylindrical, chitinized, revolute..... 10
10. Harpes normal, concave, with thickened margins and dentate tip,
Orthopodomyia
Harpes modified, narrow, recurved, prominent.....*Culiseta*³
11. Harpes few-toothed*Culicella*
Harpes with a crown of spines.....*Culex*

The genus *Culex* divides into two main sections on the genitalic characters. In the first, *Culex* proper, the harpes are tufted at tip with numerous spines, and have a longer or shorter basal arm. The unci form three parts, later four by subdivision of the original second plate. The first plate is generally triangular and heavily chitinized, having a socket near the middle into which a ligament locks that serves to open the plates. This structure is first noticeable in *Culicella dyari* (Pl. III, fig. 2) where it is rather imperfectly developed. The development in *Culex (Jamesia) concolor* (Pl. III, fig. 3) is not much better. In *Lutzia bigoti* (Pl. IV, fig. 6), the structure has improved and it can be seen fully developed in any of the true *Culex*, as in the case of *Culex (Culex) declarator* (Pl. III, fig. 4). In *Transculicia*, the plate is thickened and laminate (Pl. IV, fig. 12). The second plate is seen in membranous form in *Culicella dyari* (Pl. III, fig. 2); in *Jamesia* it has become chitinized (Pl. III, fig. 3); in *Lutzia*, toothed (Pl. IV, fig. 6). This condition is intensified in the true *Culex*

¹ Including *Haemagogus* and *Psorophora*.

² = *Taeniorrhynchus* Arribáizaga according to intention and description, but not according to designation of type.

³ = *Theobaldia* Neveu-Lemaire, preoccupied by *Theobaldius* Nevill.

and then again disappears (Pl. III, fig. 5; Pl. IV, figs. 7-11). The third plate arises as a tooth on the second, as in *Culex stenolepis* (Pl. IV, fig. 7). This tooth enlarges, as in *Culex coronator* (Pl. IV, fig. 8), becomes basal, as in *Culex factor* (Pl. IV, fig. 9), separates as in *Culex declarator* (Pl. III, fig. 5), and finally becomes quite detached as in *Culex quinquefasciatus* (Pl. IV, fig. 11). The fourth plate is small and often hard to find, possibly absent. It occurs in the form of a pair of rods protecting the anus (Pl. III, fig. 1; Pl. IV, fig. 12).

The lobe of the side piece bears primitively three setæ. To these certain others are added and finally the lobe becomes subdivided, but only slightly modified. In one form, *Phalangomyia*, there is a modification of the side pieces, which, though striking, is not fundamental, as the three primitive setæ can be easily traced (Pl. III, fig. 1).

The second general group, *Melanoconion*, is much more modified. The harpes have the tip comb-shaped, the spines in a single row, the basal arm represented by a rounded process or absent. The divisions of the unci are complex, and I am not sure of their homology. The difficulty of the study is increased by the fact that clear mounts are not always to be had of critical species of which the material may be scanty. Apparently there are primitively four plates as in *Culex (Tinolestes) latisquama* (Pl. IV, fig. 14) and *Culex (Micrædes) chalcocorystes* (Pl. IV, fig. 15). The first is a large outer sheathing plate, shown disjointed from its socket in the figure; the second a spatulate structure; the third large and furcate; the fourth rod-like with modified tip. In *Deinocerites*, the outer plate seems to be gone, the second elongated (Pl. IV, fig. 13). In the higher forms, the fourth plate seems to have disappeared, while the second assumes the form of a long hook, recurved around the other parts, as for example in *Culex (Micrædes) bisulcatus* (Pl. IV, fig. 16) and *Culex (Charoporpa) educator* (Pl. IV, fig. 17).

The lobe of the side piece in *Melanoconion* begins simply, but becomes complex and subdivided in the higher groups, notably in *Charoporpa* and *Carrollia*.

The four main groups of *Culex* separate as follows:

1. Harpes tufted, the basal process, when present, arm-like; first uncal plate with an opening ligament..... 2
- Harpes comb-shaped, the basal process not arm-like; first uncal plate jointed in a socket or absent..... 3
2. Side piece essentially unmodified.....*Culex*
- Side piece excavated, with false jointed arms.....*Phalangomyia*
3. First uncal plate absent, the second produced and spatulate,
Deinocerites
- First uncal plate present, forming an outer sheath....*Melanoconion*

In more detail, with the characters shifted a little in order to be more easily followed, the subgenera separate as below.

In the following separation of species, it has been my aim to recognize only such species as differ appreciably in the genitalia and I have accordingly united all those with similar genitalia unless they showed appreciable differences in adult coloration or larval structure. In some instances I may have united really distinct species, owing to the fact that differences in larvæ or habits were unknown to me. But even allowing for this, there remains a very considerable change from the account given in the monograph in the direction of the reduction in the number of species to be recognized. In the monograph, we relied on the coloration of the adults and larval differences, and we carried out this scheme consistently, at the same time overdoing it a little. The study of the genitalia has led me to make comparisons where we had not suspected that comparisons should be made, and has resulted in the correction of certain errors of observation. When these corrections have been made and a little more latitude is allowed for variation in adult coloration, the account in the monograph will not differ greatly from that here set forth. The errors in that work all lie in the direction of too great subdivision of species and are therefore most easily to be corrected. It is perhaps unfortunate that a more intensive study of the male genitalia of *Culex* could not have been undertaken before that volume of the monograph went to press; but multiplicity of duties at the time rendered it impossible.

TABLE OF SUBGENERA OF THE GENUS CULEX

1. Lobe of side piece with three stout setæ or appendages, neither more nor less (not counting a few unmodified setæ from the general vestiture) 2
 Lobe of side piece with more or less than three appendages, or otherwise modified 6
2. Appendages of side piece setiform or rod-like..... 3
 These appendages shortened and modified..... 4
3. Unci of two unmodified plates.....*Jamesia*
 Second plate of unci toothed.....*Lutzia*
4. Central rod mushroom-shaped; marginal ones very stout,
Tinolestes
 Appendages in a triangle, the upper two blade-like, the lower spine-like 5
5. Harpes spinose with basal arm.....*Transculicia*
 Harpes comb-shaped, without basal arm.....*Deinocerites*
6. Harpes tufted 7
 Harpes comb-shaped 10
7. Lobe of side piece divided into a triangular setose portion with a separate articulation, two setæ on a lobe and a club-shaped appendage beyond*Phalangomyia*
 This lobe not so formed..... 8
8. Lobe of side piece with more than three appendages..... 9
 Lobe of side piece with less than three appendages.....*Cacoculex*
9. Plates 2 and 3 of unci absent, 1 and 4 present.....*Neoculex*
 Plate 2 of unci present.....*Culex*
10. Fourth plate of the unci quadrately angled, ending in a retrose tooth*Microculex*
 Fourth plate of unci without a retrose tooth..... 11
11. Basal division of lobe of side piece a long arm bearing terminal setæ or leaves.....*Carrollia*
 This part divided or, if single, not a long arm..... 12
12. Clasp filament simple, the spine appendiculate..... 13
 Clasp filament modified..... 14
13. Outer division of lobe of side piece with six or more stout setæ*Micraedes*
 This part not so formed.....*Melanoconion*
14. Clasp filament not swollen at tip*Isostomyia*
 Clasp filament swollen at tip..... 15
15. Clasp filament elongated, with snout-like termination...*Chæroporpa*
 This part bluntly rounded with subspherical tip.....*Mochlostyrax*

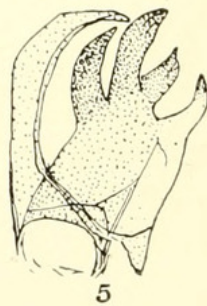
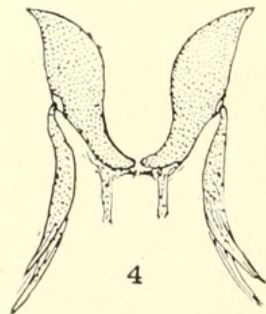
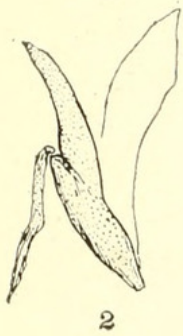
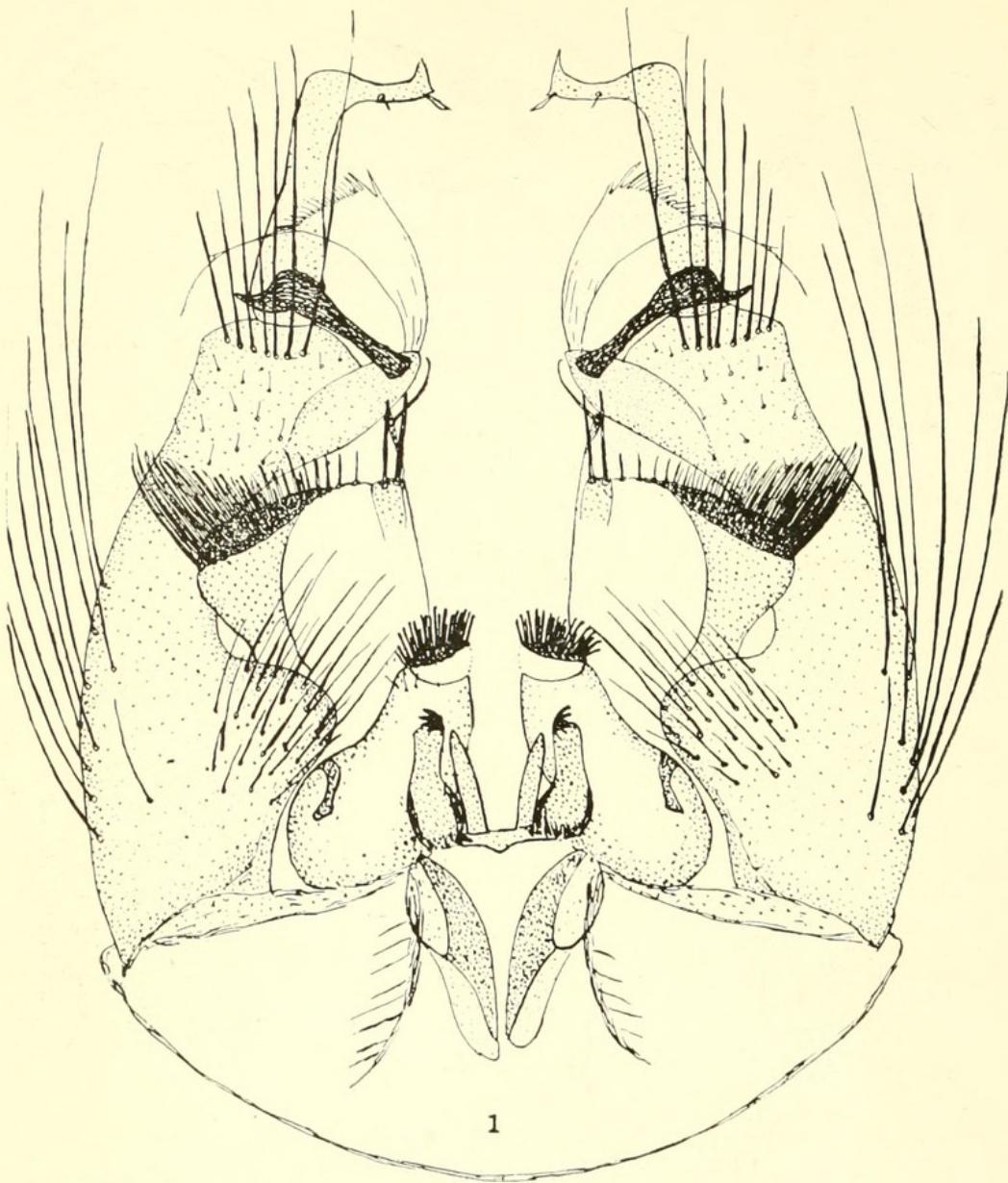
EXPLANATION OF PLATES

PLATE III

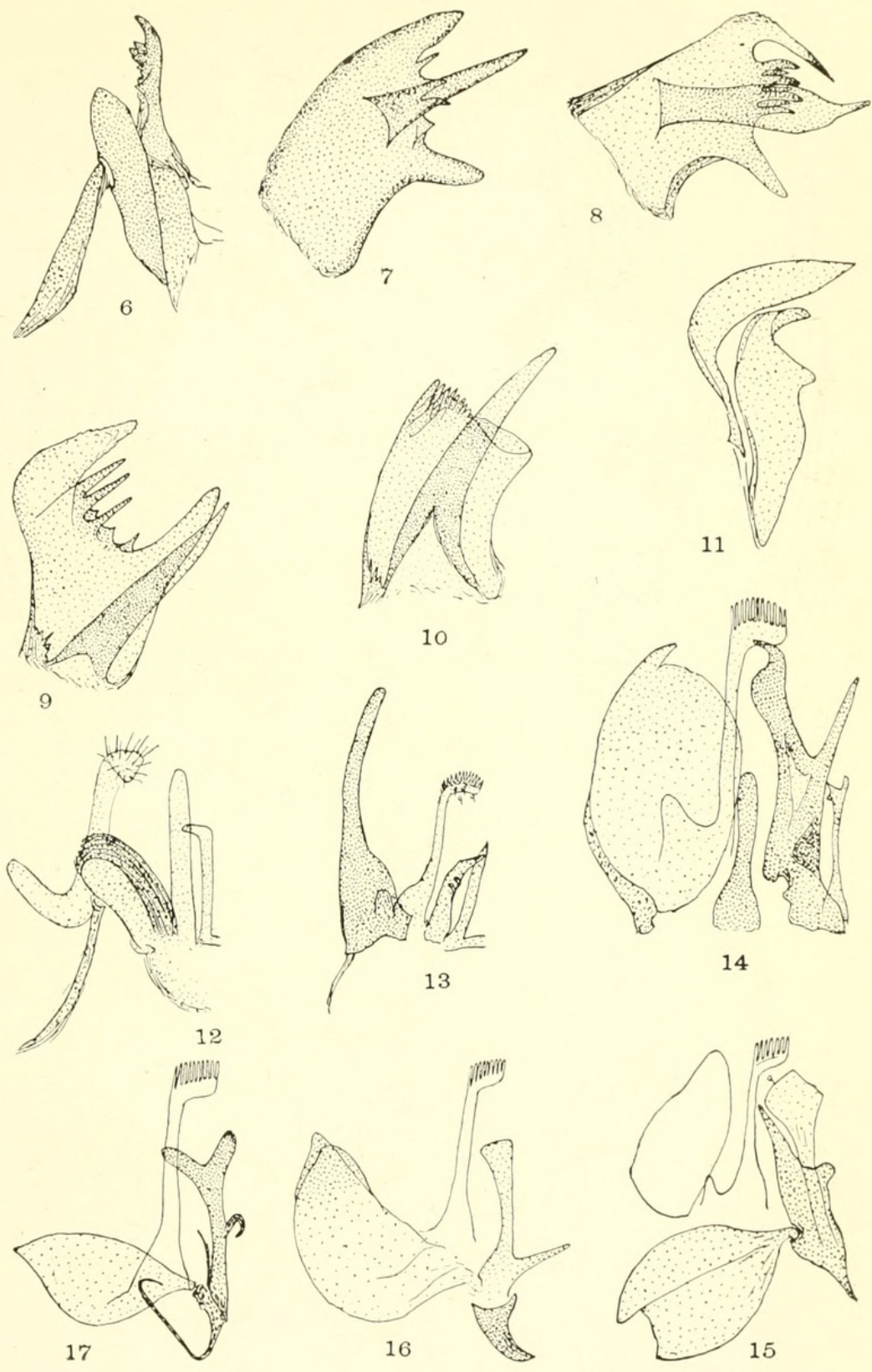
- Fig. 1. Genitalia of *Culex (Phalangomyia) debilis* Dyar and Knab.
Fig. 2. *Culicella dyari* Coq., uncal plates 1 and 2.
Fig. 3. *Culex (Jamesia) concolor* Desv., uncal plates 1 and 2.
Fig. 4. *Culex (Culex) declarator* Dyar and Knab, uncal plate 1.
Fig. 5. The same, uncal plates 2 and 3.

PLATE IV

- Fig. 6. *Culex (Lutzia) bigoti* Bell., uncal plates 1 and 2.
Fig. 7. *Culex (Culex) stenolepis* Dyar and Knab, uncal plates 2 and 3.
Fig. 8. *Culex (Culex) coronator* Dyar and Knab, uncal plates 2 and 3.
Fig. 9. *Culex (Culex) factor* Dyar and Knab, uncal plates 2 and 3.
Fig. 10. *Culex (Culex) interrogator* Dyar and Knab, uncal plates 2 and 3.
Fig. 11. *Culex (Culex) quinquefasciatus* Say, uncal plates 2 and 3.
Fig. 12. *Culex (Transculicia) cleuthera* Dyar, harpes and unci.
Fig. 13. *Culex (Deinocerites) spanius* Dyar and Knab, harpes and unci.
Fig. 14. *Culex (Tinolestes) latisquama* Coq., harpes and unci.
Fig. 15. *Culex (Micraëdes) chalcocorystes* Mart., harpes and unci.
Fig. 16. *Culex (Micraëdes) bisulcatus* Coq., harpes and unci.
Fig. 17. *Culex (Choeroporpa) educator* Dyar and Knab, harpes and unci.



GENITALIA OF CULEX



GENITALIA OF CULEX

Genus CULEX Linnaeus

Subgenus JAMESIA Christophers

Jamesia Christ., Sci. Mem. Med. Ind., n.s., No. 25, 12, 1906.

There are no American species in this subgenus, which was proposed for *Culex tigripes* Grandpré and *C. concolor* Robineau-Desvoidy of India.

Subgenus LUTZIA Theobald

Lutzia Theobald, Mon. Culic., iii, 155, 1903.

TABLE OF SPECIES

1. Tooth on basal section of second plate of unci short and blunt,
bigoti
 This tooth long and sharp.....*allostigma*

1. **Culex (Lutzia) bigoti** Bellardi.

Lutzia bigoti Howard, Dyar and Knab, Monogr., iii, 468, 1915.

2. **Culex (Lutzia) allostigma** Howard, Dyar and Knab.

Lutzia allostigma Howard, Dyar and Knab, Monog., iii, 471, 1915.

Subgenus PHALANGOMYIA Dyar and Knab

Phalangomyia Dyar and Knab, Ins. Ins. Mens., ii, 58, 1914.

3. **Culex (Phalangomyia) debilis** Dyar and Knab.

Phalangomyia debilis Dyar and Knab, Ins. Ins. Mens., ii, 58, 1914.

The side pieces are peculiarly and highly evolved (Pl. III, fig. 1), but the basal parts are of a simple *Culex* type, much as in *Lutzia*. In the figure, the first uncal plates are shown thrown back, exposing the second and fourth plates; no trace of the third plate has developed.

Subgenus CULEX Linnaeus

Culex Linnaeus, Syst. Nat., 10th ed., 602, 1758.

TABLE OF SPECIES

- | | |
|---|----|
| 1. Lobe of side piece entire..... | 2 |
| Lobe of side piece divided..... | 12 |
| 2. Lobe of side piece with three rods, a leaf and a seta..... | 3 |
| Lobe of side piece with additional appendages..... | 4 |

3. Second plate of unci with the tooth arising from the base; a radiating pecten in the angle.....*inflictus, factor*
This plate with the tooth arising in the middle; no pecten at the angle *stenolepis*
4. Lobe of side piece with three rods, a seta or filament, a leaf and a seta 5
This part with additional appendages..... 9
5. Second plate of unci with two broad arms and a central mass of close denticles*corniger*
This plate not so formed..... 6
6. Second plate of unci with two long arms with a number of teeth between; a long tooth from basal part..... 7
This plate not so formed..... 8
7. Upper limb of second plate of unci denticulate,
tarsalis, stigmatosoma, eumimetes
This limb entire.....*erythrothorax, salinarius, janitor, secutor*
This limb with a double clasp on a pedicle.....*mollis, equivocator*
8. Second plate of unci of three large teeth.....*declarator*
This plate quadrate, denticulate on upper half.....*interrogator*
This plate of two blunt teeth.....*restuans*
9. Lobe of side piece with five rods, a leaf and a seta.....*reflector*
This lobe with three rods, two setæ, a filament, a leaf and a seta 10
10. Second plate of unci toothed as in *stenolepis*.....*pinarocampa*
This plate not toothed..... 11
11. Fourth plate of unci upright, pointed.....*quinquefasciatus*
This plate oblique and tubular.....*pipiens*
12. Lobe of side piece without a leaf-like appendage..... 13
A leaf present on a separate piece..... 15
13. Harpes weak with basal recurved branch..... 14
Basal branch obsolete.....*duplicator*
14. Lower part of lobe of side piece with three rods.....*coronator*
This part with 8 to 13 setæ.....*ousqua*
15. Second plate of unci with two arms and group of small teeth between; third plate a stout tooth.....*sphinx*
This plate without arms; third plate distinct and broad..*extricator*

4. *Culex* (*Culex*) *inflictus* Theobald.

Culex inflictus Theobald, Mon. Culic., ii, 115, 1901.

Culex scholasticus Theobald, Mon. Culic., ii, 120, 1901.

Culex microsquamatus Grabham, Can. Ent., xxxvii, 407, 1905.

Culex prasinopleurus Martini, Ins. Ins. Mens., ii, 68, 1914.

var. *carmodyae* Dyar and Knab.

Culex carmodyæ Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906.

var. **palus** Theobald.

Culex palus Theobald, Mon. Culic., iii, 194, 1903.

Culex similis Theobald, Mon. Culic., iii, 207, 1903.

Culex regulator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 213, 1906.

C. inflictus has the abdomen without bands; in *palus* narrow basal segmental bands are present; in *carmodyæ* there are very faint brown rings at both ends of the tarsal joints. This variety seems confined to Santo Domingo, although not all the specimens from there are so affected. The larva of *microsquamosus* is really spiculate and not glabrous, as given in the monograph by error; the proboscis also is not swollen at the tip. In the larva of *carmodyæ* there were probably four hair-tufts on the tube, one having been detached and not three as given in the monograph. They agree entirely otherwise.

5. **Culex (Culex) factor** Dyar and Knab.

Culex factor Dyar and Knab, Jour. N. Y. Ent. Soc., xiv, 212, 1906.

Culex aikenii Dyar and Knab (larvæ only), Proc. U. S. Nat. Mus., xxxv, 61, 1908 (not *Gnophodeomyia aikenii* Aiken).

Culex proximus Dyar and Knab, Proc. Ent. Soc. Wash., xi, 38, 1909.

Culex lachrimans Dyar and Knab (in part), Smiths. Misc. Colls., quart. iss., lii, 259, 1909.

The genitalia are not distinguishable from *inflictus*; but the adult female has basal abdominal bands not widened at the sides, although they may be absent. The larva has the air tube a little shorter than in *inflictus*; the third pair of head hairs are more approximate. In *proximus* the skin of the larva is really spicular, not glabrous as erroneously stated in the monograph.

6. **Culex (Culex) stenolepis** Dyar and Knab.

Culex stenolepis Howard, Dyar and Knab, Monog., iii, 249, 1915.

7. **Culex (Culex) pinarocampa** Dyar and Knab.

Culex pinarocampa Howard, Dyar and Knab, Monog., iii, 251, 1915.

8. *Culex (Culex) corniger* Theobald.

Culex corniger Howard, Dyar and Knab, Monog., iii, 240, 1915.

The genus *Trichopronomyia* Theobald is available for this species, but, although it is unique, I do not think the distinctions are strong enough for a subgeneric separation.

9. *Culex (Culex) tarsalis* Coquillett.

Culex tarsalis Howard, Dyar and Knab, Monog., iii, 230, 1915.

10. *Culex (Culex) stigmatosoma* Dyar.

Culex stigmatosoma Howard, Dyar and Knab, Monog., iii, 236, 1915.

11. *Culex (Culex) eumimetes* Dyar and Knab.

Culex eumimetes Howard, Dyar and Knab, Monog., iii, 238, 1915.

The genitalia agree with *tarsalis* while the adult is colored like *stigmatosoma*, though there is nothing very decisive about this as the difference between *tarsalis* and *stigmatosoma* is slight, consisting only in the difference in the number of teeth on the second uncal plate, which varies. Probably *eumimetes* is the same as *stigmatosoma*; the larval differences on which the species was founded and which we repeat in the monograph with distinctly less emphasis do not exist.

It will be noted that *duplicator*, which falls here on coloration, is entirely unrelated on genitalic characters, thus confirming the value of the different wing-scaling.

12. *Culex (Culex) erythrothorax* Dyar.

Culex erythrothorax Howard, Dyar and Knab, Monog., iii, 315, 1915.

13. *Culex (Culex) salinarius* Coquillett.

Culex salinarius Howard, Dyar and Knab, Monog., iii, 373, 1915.

14. *Culex (Culex) janitor* Theobald.

Culex janitor Howard, Dyar and Knab, Monog., iii, 258, 1915.

The larvæ differ from allied species in having the antennæ without the "notch," agreeing in this with *restuans*.

15. *Culex (Culex) secutor* Theobald.

Culex secutor Theobald, Mon. Culic., ii, 321, 1901.

Culex lamentator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 219, 1906.

Culex toweri Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 13, 1907.

The three names were given to specimens from Jamaica, Santo Domingo, and Porto Rico, respectively, but I think only one species is represented, doubtless occurring in Cuba also. The larva has the tufts of the air tube crowded back along the ventral line as in *tarsalis*, the normal symmetry being thereby destroyed.

16. *Culex (Culex) mollis* Dyar and Knab.

Culex mollis Howard, Dyar and Knab, Monog., iii, 267, 1915.

Hardly distinguishable from *equivocator*; but the adult female has basal abdominal white bands, which are absent in the other species. The specimens are from Trinidad.

17. *Culex (Culex) equivocator* Dyar and Knab.

Culex equivocator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 203, 1907.

Culex elocutilis Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

Described from Panama. Specimens are before me extending the range to British Guiana (H. W. B. Moore).

18. *Culex (Culex) declarator* Dyar and Knab.

Culex declarator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex jubillator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 201, 1907.

Culex vindicator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

Culex dictator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 255, 1909.

var. *proclamator* Dyar and Knab.

Culex proclamator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex inquisitor Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex revelator Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 202, 1907.

The adult female has the abdomen with basal segmental white spots, sometimes extended as dull whitish bands; but the central spot whiter or produced. In the male there are even white bands. The genitalia have a peculiar second uncal plate, consisting of three stout claws from a circular base. The larva has the head hairs in threes or four-three, the skin spicular, the air-tube with three tufts, the middle one moved out of line; pecten commonly long, but not uniformly so.

In our original descriptions of *declarator*, *proclamator* and *inquisitor*, from larvæ, three lengths of the air-tube pecten are shown; but these characters become less distinct the more specimens are examined. Nevertheless, two races seem indicated. In *declarator* proper, the pecten is short, the teeth about 4 x 1 and about 14 in number. It occurs from Trinidad to Panama, including the Lesser Antilles, specifically Dominica and St. Thomas. In *proclamator* the pecten is longer, the teeth 5 x 1 or over and 18 to 20 in number. It occurs from Mexico to Panama, and the two forms may coalesce in the latter region.

The exact position of the hair tufts on the air tube seems to be unreliable. The character found in the adult of the white tip of the last tarsal joint being present or absent seems to be variable. The banding of the abdomen as given in the monograph, I do not verify on reëxamination.

19. **Culex (Culex) interrogator** Dyar and Knab.

Culex interrogator Howard, Dyar and Knab, Monog., iii, 417, 1915.

Quite erroneously placed in the monograph in the *Melanoconion* group. The proboscis should not have been taken as "swollen at the tip," or, if so, then the character is worthless, for this is a true *Culex*.

20. **Culex (Culex) restuans** Theobald.

Culex restuans Howard, Dyar and Knab, Monog., iii, 333, 1915.

21. **Culex (Culex) reflector** Dyar and Knab.

Culex reflector Howard, Dyar and Knab, Monog., iii, 419, 1915.

The same remark applies as for *interrogator*.

22. **Culex (Culex) quinquefasciatus** Say

Culex quinquefasciatus Howard, Dyar and Knab, Monog., iii, 345, 1915.

Culex revocator Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 256, 1909.

Culex aseychæ Dyar and Knab, Ins. Insc. Mens., iii, 112, 1915.

The genitalia furnish no characters for considering *revocator* as a distinct species peculiar to Jamaica.

23. **Culex (Culex) pipiens** Linnaeus.

Culex pipiens Howard, Dyar and Knab, Monog., iii, 360, 1915.

Culex flavipes Macquart, Dipt. Exot., i, part 1, 35, 1838.

Culex flavipes Brèthes, Anal. Mus. Nac. Hist. Nat. B. A., xxviii, 210, 1916.

There seems now no doubt that *pipiens* is more widely distributed than given by us in the monograph. Not only does it occur in California, as shown by Mr. Knab and myself (Ins. Insc. Mens., v, 178, 1917), but the excellent figures recently published by Juan Brèthes show that it is widespread in Chile and Argentina, under the name *Culex flavipes*. The name *flavipes* must therefore be hereafter cited in the synonymy of *pipiens* instead of *quinquefasciatus*, as in the monograph (vol. iii, p. 345, 1915).

24. **Culex (Culex) coronator** Dyar and Knab.

Culex coronator Howard, Dyar and Knab, Monog., iii, 286, 1915.

25. **Culex (Culex) ousqua**, new species.

Male genitalia. Lobe of side piece divided, the inner portion large and conical, bearing 10 to 13 hairs, no spines being distinguishable; outer portion small, distinct, bearing about five hairs. Otherwise as in *coronator*, the second plate of unci commonly with fewer teeth, four to seven.

The male adult has faint white rings at both ends of the tarsal joints, the last hind tarsal white; abdomen with white basal segmental bands, mesially produced, as in *coronator*.

Type, male, No. 21602, U. S. Nat. Mus.; Panama (Busck 181.1). Also Canal Zone, Panama (Jennings 52) and Culebra, Canal Zone, Panama (L. H. Dunn, C-77).

The larva has several spines on one side of the air tube subapically.

26. **Culex (Culex) duplicator** Dyar and Knab.

Culex duplicator Howard, Dyar and Knab, Monog., iii, 235, 1915.

27. **Culex (Culex) extricator** Dyar and Knab.

Culex extricator Howard, Dyar and Knab, Monog., iii, 325, 1915.

28. **Culex (Culex) sphinx** Howard, Dyar and Knab.

Culex sphinx Howard, Dyar and Knab, Monog., iii, 301, 1915.

Culex sphinx Dyar and Knab, Ins. Ins. Mens., iii, 114, 1915.

Subgenus NEOCULEX Dyar

Neoculex Dyar, Proc. Ent. Soc. Wash., vii, 45, 48, 1905.

TABLE OF SPECIES

1. Bridge of the fourth uncal plate broad.....*saxatilis*
This bridge narrow.....*derivator*

29. **Culex (Neoculex) saxatilis** Grossbeck.

Culex territans Howard, Dyar and Knab, Monog., iii, 293, 1915.

30. **Culex (Neoculex) derivator** Dyar and Knab.

Culex derivator Howard, Dyar and Knab, Monog., iii, 290, 1915.

Subgenus CACOCULEX, new

With the characters of the table. Type, *Culex habilitator* Dyar and Knab.

31. **Culex (Cacoculex) habilitator** Dyar and Knab.

Culex habilitator Howard, Dyar and Knab, Monog., iii, 262, 1915.

Culex eremita Howard, Dyar and Knab, Monog., iii, 261, 1915.

Subgenus TRANSCULICIA Dyar

Transculicia Dyar, Ins. Ins. Mens., v, 184, 1917.

32. **Culex (Transculicia) eleuthera** Dyar

Culex (Transculicia) eleuthera Dyar, Ins. Ins. Mens., v, 184, 1917.

Subgenus DEINOCERITES Theobald

Deinocerites Theobald, Mon. Culic., ii, 215, 1901.

Brachomyia Theobald, Mon. Culic., ii, 343, 1901.

Dinomimetes Knab, Journ. N. Y. Ent. Soc., xv, 120, 1907.

Dinanamesus Dyar and Knab, Smiths. Misc. Colls., quart. iss., lii, 259, 1909.

Some of the *Culex* addicted to crab-holes have developed elongated antennal joints, on which genera and even higher groups have been founded. From the point of view of the genitalia, this appears to be an over-valuation. However, there are some good larval characters, and *Deinocerites* may be conveniently considered a genus. But I do not think that *Dinomimctes* and *Dinanamesus* will hold.

TABLE OF SPECIES

- | | |
|--|---------------------|
| 1. Claws of the clasp filament equal..... | 2 |
| These claws unequal..... | 4 |
| 2. Teeth of harpe about 15..... | 3 |
| Teeth of harpe over 20..... | <i>melanophylum</i> |
| 3. Harpal plate longer, exceeding the lobes of side piece..... | <i>cancer</i> |
| This plate shorter, not exceeding lobe of side piece..... | <i>troglydytus</i> |
| 4. Third uncal plate simple; second with two revolute spines... <i>spanius</i> | |
| Second plate with a horn and many lateral spines; third plate spatulate | 5 |
| 5. Harpal plate long and slender beyond base..... <i>epitedeus</i> | |
| This plate shorter, not exceeding the lobe of side piece..... | <i>pseudes</i> |

33. *Culex* (*Deinocerites*) *spanius* Dyar and Knab.

Dinanamesus spanius Howard, Dyar and Knab, Monog., iii, 213, 1915.

34. *Culex* (*Deinocerites*) *epitedeus* Knab.

Dinomimetes epitedeus Howard, Dyar and Knab, Monog., iii, 197, 1915.

35. *Culex* (*Deinocerites*) *pseudes* Dyar and Knab.

Deinocerites pseudes Howard, Dyar and Knab, Monog., iii, 210, 1915.

36. *Culex* (*Deinocerites*) *troglydytus* Dyar and Knab.

Deinocerites troglydytus Howard, Dyar and Knab, Monog., iii, 206, 1915.

37. **Culex (Deinocerites) cancer** Theobald.

Deinocerites cancer Howard, Dyar and Knab, Monog., iii, 201, 1915.

38. **Culex (Deinocerites) melanophylum** Dyar and Knab.

Deinocerites melanophylum Howard, Dyar and Knab, Monog., iii, 207, 1915.

Subgenus TINOLESTES Coquillett

Tinolestes Coquillett, Proc. Ent. Soc. Wash., vii, 185, 1905.

39. **Culex (Tinolestes) latisquama** Coquillett.

Culex latisquama Howard, Dyar and Knab, Monog., iii, 303, 1915.

Subgenus MICRAËDES Coquillett

Micraëdes Coquillett, Proc. Ent. Soc. Wash., vii, 185, 1905.

TABLE OF SPECIES

1. First plate of unci very broad, notched, and jointed to second plate,
chalcocorystes
 This plate triangulate, scarcely modified.....*bisulcatus*
 This plate attenuate on the outer half and curled.....*restrictor*

40. **Culex (Micraëdes) chalcocorystes** Martini.

Culex chalcocorystes Martini, Ins. Ins. Mens., ii, 70, 1914.

The unci are almost exactly as in *latisquama*, and on that basis this species might with propriety be placed in *Tinolestes*. The present location is based on the structure of the lobe of the side piece.

41. **Culex (Micraëdes) bisulcatus** Coquillett.

Culex bisulcatus Howard, Dyar and Knab, Monog., iii, 306, 1915.

42. **Culex (Micraëdes) restrictor** Dyar and Knab.

Culex restrictor Howard, Dyar and Knab, Monog., iii, 331, 1915.

This species has affinities with *Melanoconion* and might with almost equal propriety be placed there.

Subgenus ISOSTOMYIA Coquillett

Isostomyia Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. ser. 11, 16, 24, 1906.

This name is here employed in the sense intended by Coquillett, and not in that which his citation of type would imply.

43. **Culex (Isostomyia) conservator** Dyar and Knab.

Culex conservator Howard, Dyar and Knab, Monog., iii, 308, 1915.

This species is congeneric with *restrictor* as far as uncus development goes or lobes of side piece. It is separated on account of the modification of the clasp filament.

Subgenus MELANOCONION Theobald

Melanoconion Theobald, Mon. Culic., iii, 238, 1903.

TABLE OF SPECIES

1. Upper division of lobe of side piece with a leaf and three setæ,
atratus
 This part with a seta, a leaf, and two setæ.....*falsificator*

44. **Culex (Melanoconion) atratus** Theobald.

Culex atratus Howard, Dyar and Knab, Monog., iii, 388, 1915.

45. **Culex (Melanoconion) falsificator** Dyar and Knab.

Culex falsificator Howard, Dyar and Knab, Monog., iii, 425, 1915.

Culex agitator Howard, Dyar and Knab (in part, adult only),
 Monog., iii, 384, 1915.

This Cuban species comes very close to *atratus* from Jamaica and may not be distinct. The apparent genitalic difference may be due to the position of the parts on the slide. The colorational differences given in the monograph appear unreliable. The adults associated with the larvæ of *agitator* do not appertain to that species.

Subgenus CHÆROPORPA, new¹

With the characters of the table. Type, *Culex anips* Dyar.

TABLE OF SPECIES

1. Clasp filament with a horn-like tuft before tip; terminal spine
 uniform 2

¹ *Gnophodeomyia* Theobald, type *inornata* Theobald (= *aikenii* Aiken), may be an older name for the subgenus *Choeroporpa* or a synonym of *Melanoconion*.

- Clasp filament narrowed at tip, the terminal spine widened and appendiculate 4
2. Anterior crest of clasp filament of appressed or consolidated spines. 3
This crest composed of fine hairs.....*anips*
3. Terminal spine of clasp stout; anterior crest solid.....*erraticus*
This spine delicate; anterior crest of compressed spines....*peccator*
4. Outer division of lobe of side piece with a leaf-like appendage.... 5
Without this structure..... 9
5. The leaf large and expanded, exceeding the accompanying setæ. 6
The leaf small and oval, not exceeding the accompanying setæ. 8
6. Harpes with delicate hair-like pecten, the marginal tooth stout,
mutator
Harpes with a distinct comb..... 7
7. Harpal comb of about 8-10 teeth; leaf of outer division of lobe
of side piece adjacent to setæ.....*leprincei*
Harpal comb of about 6 teeth; the leaf free from setæ...*invocator*
8. Outer division of lobe of side piece with the leaf adjacent to the
two filaments on basal margin; second plate of unci bifid,
conspirator
This leaf adjacent to the three filaments on the distal margin;
second plate of unci trifid.....*bastagarius, carcinophilus*
9. Second plate of unci without an adjacent pair of hooks or
spines 10
This plate with hooks or spines..... 11
10. Limbs of second plate of unci subequal.....*chrysonotum*
Outer limb of this plate long, the inner short and often bent at
right angles*elevator*
11. Second plate of unci with a hook on inner margin.....*educator*
This plate with a spine on each margin..... 12
12. Apical portion of second plate quadrate and denticulate..*iolambdis*
This portion smooth and arcuate.....*inhibitor*

46. **Culex (Chæroporpa) anips** Dyar.

Culex anips Dyar, Ins. Ins. Mens., iv, 48, 1916.

Culex (Melanoconion) anips Dyar and Knab, Ins. Ins. Mens.,
v, 180, 1917.

47. **Culex (Chæroporpa) erraticus** Dyar and Knab.

Culex (Melanoconion) erraticus Dyar and Knab, Ins. Ins. Mens.,
v, 179, 1917.

48. **Culex (Chæroporpa) peccator** Dyar and Knab.

Culex (Melanoconion) peccator Dyar and Knab, Ins. Ins. Mens.,
v, 179, 1917.

49. **Culex (Chæroporpa) mutator** Dyar and Knab.

Culex mutator Howard, Dyar and Knab, Monog., iii, 422, 1915.

50. **Culex (Chæroporpa) leprincei** Dyar and Knab.

Culex leprincei Howard, Dyar and Knab, Monog., iii, 397, 1915.

Culex trachycampa Howard, Dyar and Knab, Monog., iii, 329, 1915.

The genitalia and larvæ of *trachycampa* and *leprincei* are alike. The separation of the adults in the monograph was due to an error of observation of the female proboscis, being called swollen in one case and not in the other—an error very easy to make.

51. **Culex (Chæroporpa) invocator** Pazos.

Culex invocator Howard, Dyar and Knab, Monog., iii, 323, 1915.

52. **Culex (Chæroporpa) conspirator** Dyar and Knab.

Culex conspirator Howard, Dyar and Knab, Monog., iii, 410, 1915.

53. **Culex (Chæroporpa) carcinophilus** Dyar and Knab.

Culex carcinophilus Howard, Dyar and Knab, Monog., iii, 412, 1915.

I have only one male mounted in poor condition and indistinguishable from *bastagarius*; but the larvæ differ obviously.

54. **Culex (Chæroporpa) bastagarius** Dyar and Knab.

Culex bastagarius Howard, Dyar and Knab, Monog., iii, 424, 1915.

55. **Culex (Chæroporpa) chrysonotum** Dyar and Knab.

Culex chrysonotum Howard, Dyar and Knab, Monog., iii, 310, 1915.

56. **Culex (Chæroporpa) inhibitor** Dyar and Knab.

Culex inhibitor Howard, Dyar and Knab, Monog., iii, 391, 1915.

57. **Culex (Chæroporpa) educator** Dyar and Knab.

Culex educator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 217, 1906.

Culex elevator Howard, Dyar and Knab (in part), Monog., iii, 414, 1915.

Culex apateticus Howard, Dyar and Knab (in part), Monog., iii, 321, 1915.

58. **Culex (Chæroporpa) elevator** Dyar and Knab.

Culex elevator Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 217, 1906.

Culex elevator Howard, Dyar and Knab (in part), Monog., iii, 414, 1915.

Culex apateticus Howard, Dyar and Knab (in part), Monog., iii, 321, 1915.

In the monograph we united *elevator* and *educator*; but the genitalia are obviously different. On the other hand, we created the new species *apateticus*, based on a mixture of *elevator* and *educator*. The types of *apateticus* are three of Jennings' No. 498, the mounted male being *elevator*, plus two of Jennings' No. 454 and one of Jennings' No. 522, the two mounted males being *educator*. We placed these in the monograph with *hesitator*, a *Mochlostyrax*, but this also was placed wrongly. Both species should have the female proboscis swollen at the tip, but we have put them in the "straight proboscis" section.

59. **Culex (Chæroporpa) iolambdis**, new species.

Male genitalia.—Comb of harpe with about eight teeth; second plate of unci with a horn on either side, the tip quadrately terminated and denticulate; outer division of lobe of side piece obsoletely subdivided, the proximal portion bearing a hooked filament; at the base is inserted a broad filament but not leaf-shaped, and on a scarcely distinguishable prominence below are three crooked filaments. Clasp filament not strongly swollen, the tip attenuated, truncate, with snout-like termination; a groove at end and straight oblique groove across; setæ very obscure; cresting pile very small, reaching to near end of snout.

Only one slide is before me; near *educator*, of which I hope it is not a distorted specimen.

The adult has the tarsi wholly black; palpi exceeding the proboscis, black, the last two joints sparsely and evenly haired. Abdomen entirely black dorsally with bronzy luster; the venter appears wholly black.

Type, male, No. 21603, U. S. Nat. Mus.; Panama, bred by Mr. A. Busck but at present without label.

It is possible that this is the adult of *Culex investigator* Dyar and Knab, described from Mexico, the adult being unknown. The larva of *investigator* falls in the table with *inhibitor*, with the adult of which *iolambdis* is allied.

Subgenus MOCHLOSTYRAX Dyar and Knab

Mochlostyrax Dyar and Knab, Journ. N. Y. Ent. Soc., xiv, 223, 1906.

TABLE OF SPECIES

1. Second plate of unci with a distinct radial pecten in one angle of the plate 2
Without this character..... 5
2. Basal lobes of penultimate segment minute, pointed, hairless, *reductor*
These lobes larger with a few or many hairs..... 3
3. Basal lobe small, few haired; harpes with 6 teeth..... 4
Basal lobe large, many haired; harpes with 8 teeth..... *hesitator*
4. Tip of clasp filament foot-shaped..... *floridanus*
Tip of clasp filament roughly elliptical..... *pilosus*
5. Outer division of lobe of side piece forked, bearing many flat filaments but no leaf..... *caudelli*
This part entire, bearing two leaves and two filaments, *peribleptus, moorei*

60. *Culex (Mochlostyrax) reductor* Dyar and Knab.

Culex reductor Howard, Dyar and Knab, Monog., iii, 399, 1915.

61. *Culex (Mochlostyrax) hesitator* Dyar and Knab.

Culex hesitator Howard, Dyar and Knab, Monog., iii, 319, 1915.

Placed in the wrong section in the monograph. The female proboscis should be swollen.

62. *Culex (Mochlostyrax) floridanus* Dyar and Knab.

Culex (Mochlostyrax) floridanus Dyar and Knab, Ins. Ins. Mens., v, 180, 1917.¹

63. *Culex (Mochlostyrax) pilosus* Dyar and Knab.

Culex pilosus Howard, Dyar and Knab, Monog., iii, 393, 1915.

¹ Fresh material shows that the Cuban species (*agitator* = *cubensis* = *mastigia*) must be again separated from the Floridian species (*floridanus* = *deceptor*) on adult colorational characters.



1918. "A revision of the American species of *Culex* on the male genitalia."
Insecutor inscitiae menstruus 6, 86–111. <https://doi.org/10.5962/bhl.part.14936>.

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