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With Compliments

R. W. Lee

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By
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18th Medical Command, U. S. Army, KOREA
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P R E F A C E

"Illustrated Taxonomic Keys to Genera and Species of Mosquito Larvae of Korea," which was written preliminarily in 1991 by entomologists of the 5th Medical Detachment, 8th U.S. Army, has been utilized for years as the most comprehensive and convenient taxonomic manual for identification of the mosquitoes of Korea. Since 1991, some new distribution records have been recorded in Korea and much new taxonomic information has been published in a wide variety of scientific publications. This work attempts to combine information from all of these sources into a single document, as well as to summarize revised taxonomic synonyms of species occurring in Korea. Based on the available publications, the total number of mosquitoes recorded from Korea is now considered to be 55 species in 10 genera.

At present, the 5th Medical Detachment is continuing its mosquito surveillance program on the taxonomy, biology and distribution of the mosquito fauna. The preparation of these revised pictorial keys is part of this continuing taxonomic study. An attempt has been made to produce a key as simple and accurate as possible. The illustrations, to include key characteristics, were selected from a composite of several specimens representing all species listed. The author made every effort to provide the most detailed illustrations for identification.

As collections of specimens continue, there is a possibility that additional species will be found in Korea. I hope this publication will provide useful information not only for military and civilian entomologists of the 8th U.S. Army, but also for the other entomologists who are interested in mosquito taxonomy in Korea.

The author wishes to express his sincere thanks to Major William B. Miller and Captain Robert S. Richards, Commander, 5th Medical Detachment (Entomology) for their support and editorial review of the manuscript, and also to Lieutenant Colonel Jeffrey B. Clark, Commander, Headquarters, 168th Medical Battalion, 18th Medical Command, U. S. Army, for his support and encouragement.

Finally the author desires to express his appreciation to Dr. Heung Chul Kim, Medical Entomologist, the 5th Medical Detachment, who assisted the senior author in checking the illustrations and the proofreading the manuscript.


LEE, Kwan Woo
April 1999

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LIST OF SPECIES INCLUDED

1. <i>Toxorhynchites (Toxorhynchites) christophi</i> (Portschinsky), 1884 ...	6
2. <i>Tripteroides (Tripteroides) bambusa bambusa</i> (Yamada), 1917	7
3. <i>Coquillettidia (Coquillettidia) ochracea</i> (Theobald), 1903	8
4. <i>Mansonia (Mansonioides) uniformis</i> (Theobald), 1901	8
5. <i>Armigeres (Armigeres) subalbatus</i> (Coquillett), 1898	9
6. <i>Culiseta (Culiseta) bergrothi</i> (Edwards), 1921	10
7. <i>Culiseta (Culisella) nipponica</i> La Casse and Yamaguti, 1950	10
8. <i>Anopheles (Anopheles) lindesayi japonicus</i> Yamada, 1918	11
9. <i>Anopheles (Anopheles) koreicus</i> Yamada and watanabe, 1918	12
10. <i>Anopheles (Anopheles) sineroides</i> Yamada, 1924	12
11. <i>Anopheles (Anopheles) sinensis</i> Wiedemann, 1828	12
12. <i>Anopheles (Anopheles) yatsushiroensis</i> Miyazaki, 1951	12
13. <i>Anopheles (Anopheles) pullus</i> M. Yamada, 1937	12
14. <i>Anopheles (Anopheles) lesteri</i> Baisas and Hu, 1936	12
15. <i>Culex (Lutzia) halifaxii</i> Theobald, 1903	13
16. <i>Culex (Lutzia) fuscans</i> Wiedemann, 1820	13
17. <i>Culex (Eumelanomyia) hayashii hayashii</i> Yamada, 1917	14
18. <i>Culex (Neoculex) rubensis</i> Sasa and Takahasi, 1948	15
19. <i>Culex (Lephoceraomyia) infantulus</i> Edwards, 1922	15
20. <i>Culex (Culiciomyia) sasai kano</i> , Nitahara and Awaya, 1945	15
21. <i>Culex (Culiciomyia) kyotoensis</i> Yamaguti and La Casse, 1952	16
22. <i>Culex (Barraudius) inatomii</i> Kamimura and Wada, 1974	17
23. <i>Culex (Culex) vagans</i> Wiedemann, 1828	17
24. <i>Culex (Culex) pipiens pallens</i> Coquillett, 1898	18
25. <i>Culex (Culex) pipiens molestus</i> Forskal, 1775	18
26. <i>Culex (Culex) pipiens quinquefasciatus</i>	18

27. <i>Culex (Culex) bitaeniorhynchus</i> Giles, 1901	19
28. <i>Culex (Culex) sinensis</i> Theobald, 1903	19
29. <i>Culex (Culex) whitmorei</i> (Giles), 1904	20
30. <i>Culex (Culex) pseudovishnui</i> Colless, 1957	20
31. <i>Culex (Culex) sitiens</i> Wiedemann, 1828	21
32. <i>Culex (Culex) tritaeniorhynchus</i> Giles, 1901	21
33. <i>Culex (Culex) jacksoni</i> Edwards, 1934	22
34. <i>Culex (Culex) mimeticus</i> Noe, 1899	23
35. <i>Culex (Culex) orientalis</i> Edwards, 1921	23
36. <i>Aedes (Stegomyia) chemulpoensis</i> Yamada, 1921	25
37. <i>Aedes (Stegomyia) albopictus</i> (Skuse), 1894	25
38. <i>Aedes (Stegomyia) flavopictus flavopictus</i> Yamada, 1921	26
39. <i>Aedes (Stegomyia) galloisi</i> Yamada, 1921	26
40. <i>Aedes (Aedes) esoensis</i> Yamada, 1921	27
41. <i>Aedes (Aedimorphus) vexans vexans</i> (Meigen), 1830	28
42. <i>Aedes (Aedimorphus) vexans nipponii</i> (Theobald), 1907	28
43. <i>Aedes (Aedimorphus) alboscuteclatus</i> (Theobald), 1905	28
44. <i>Aedes (Neomelaniconion) lineatopennis</i> (Ludlow), 1905	29
45. <i>Aedes (Edwardsaedes) bekkui</i> Mogi, 1977	29
46. <i>Aedes (Finlaya) nipponicus</i> La Gasse and Yamaguti, 1950	26
47. <i>Aedes (Finlaya) hatorii</i> Yamada, 1921	29
48. <i>Aedes (Finlaya) alektorovi</i> Stackelberg, 1943	30
49. <i>Aedes (Finlaya) seoulensis</i> Yamada, 1921	30
50. <i>Aedes (Finlaya) oreophilus</i> (Edwards), 1916	31
51. <i>Aedes (Finlaya) togoi</i> (Theobald), 1907	32
52. <i>Aedes (Finlaya) japonicus japonicus</i> (Theobald), 1901	33
53. <i>Aedes (Finlaya) koreicus</i> (Edwards), 1917	33
54. <i>Aedes (Ochlerotatus) dorsalis</i> (Meigen), 1830	31
55. <i>Heizmannia lii</i> Wu, 1936	32

**Morphological Characteristics
of Anopheline and Culicine
Mosquito Larvae
(Fourth Instar)**

**FIGURES 1-4. MORPHOLOGY OF FOURTH INSTAR
LARVA OF ANOPHELINE MOSQUITOES**

1. **HEAD:** dorsal-left, ventral-right
2. **THORAX:** dorsal-left, ventral-right
3. **ABDOMINAL SEGMENTS (I-VI):** dorsal-left, ventral-right
4. **TERMINAL SEGMENT (VII-X) OF ABDOMEN**

ABBREVIATION:

A = Antenna	P = Prothorax
C = Head	PH = Palmate hair
FC = Frontoclypeus	PT = Pecten tooth
CE = Compound eye	S = Siphon
CS = Comb scales	AC = Acus
PC = Pecten	SL = Saddle
G = Anal gills	SM = Stemma
M = Mesothorax	T = Metathorax
MP = Mentum plate	TP = Tergal plate
	1-MX = Cardinal seta

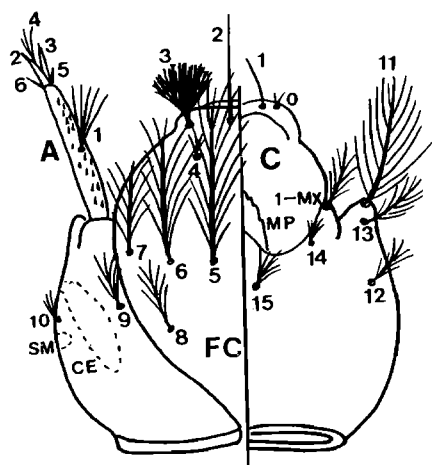


Fig. 1

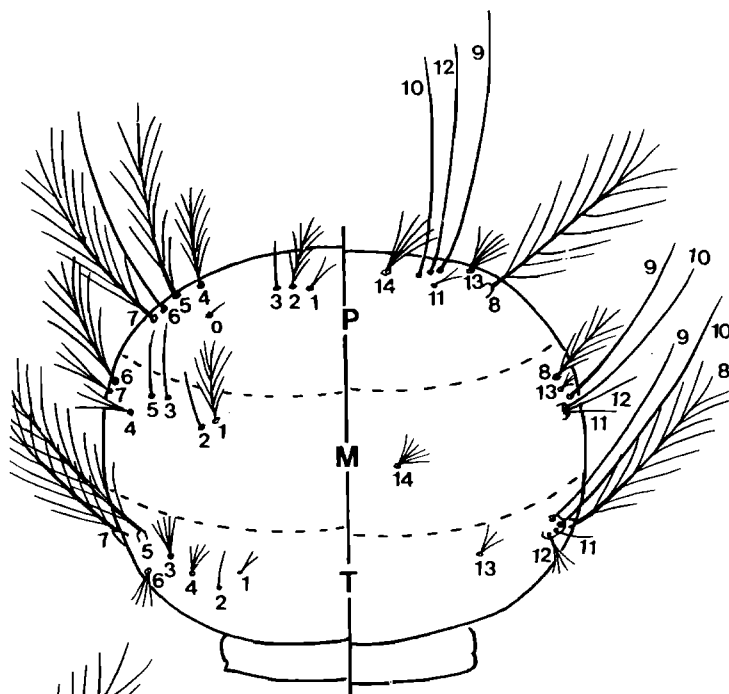


Fig. 2

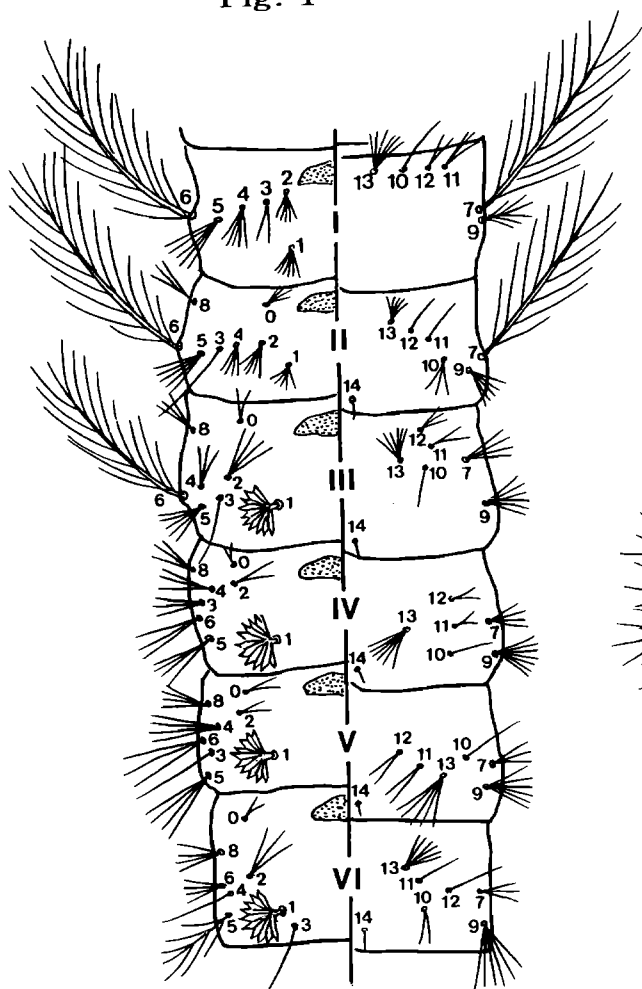


Fig. 3

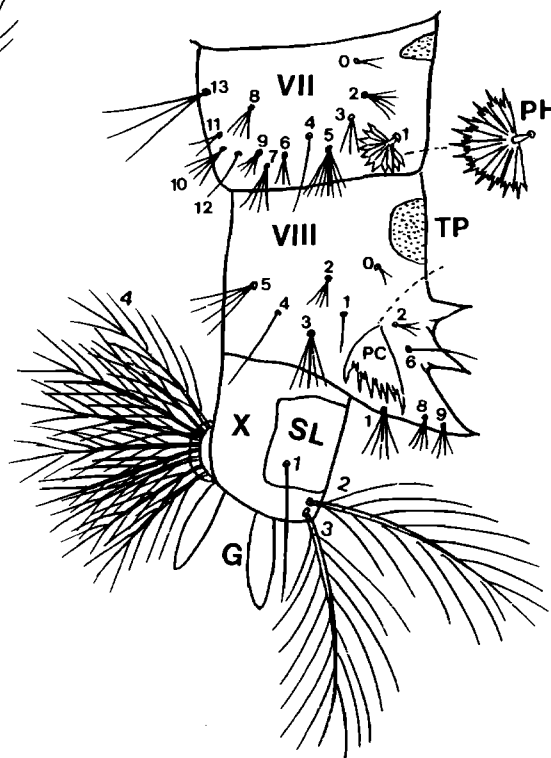


Fig. 4

**FIGURES 5-8. FOURTH INSTAR LARVA OF
CULICINE MOSQUITOES**

- 5. **HEAD:** dorsal-left, ventral-right
- 6. **THORAX:** dorsal-left, ventral-right
- 7. **ABDOMINAL SEGMENT (I-VI):** dorsal-left, ventral-right
- 8. **TERMINAL SEGMENT (VII-X) OF ABDOMEN**

ABBREVIATION:

A = Antenna	P = Prothorax
C = Head	PH = Palmate hair
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M = Mesothorax	T = Metathorax
MP = Mentum plate	TP = Tergal plate
	1-MX = Cardinal seta

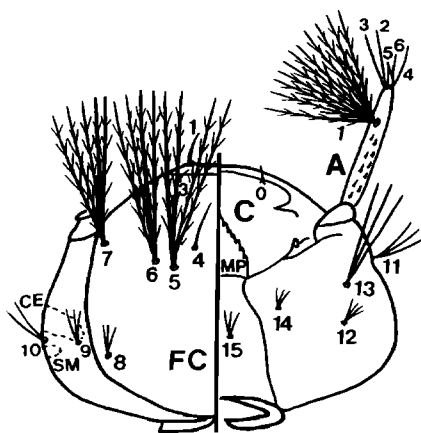


Fig. 5

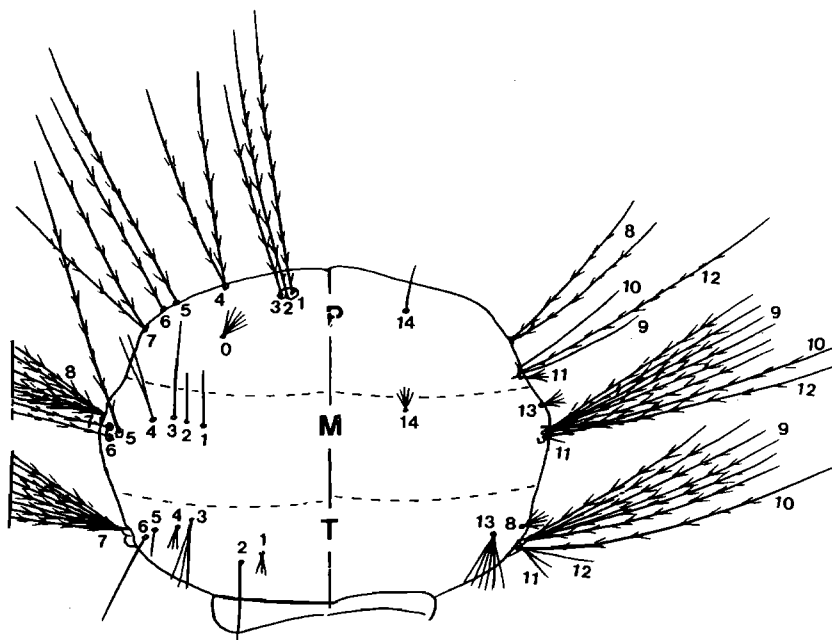


Fig. 6

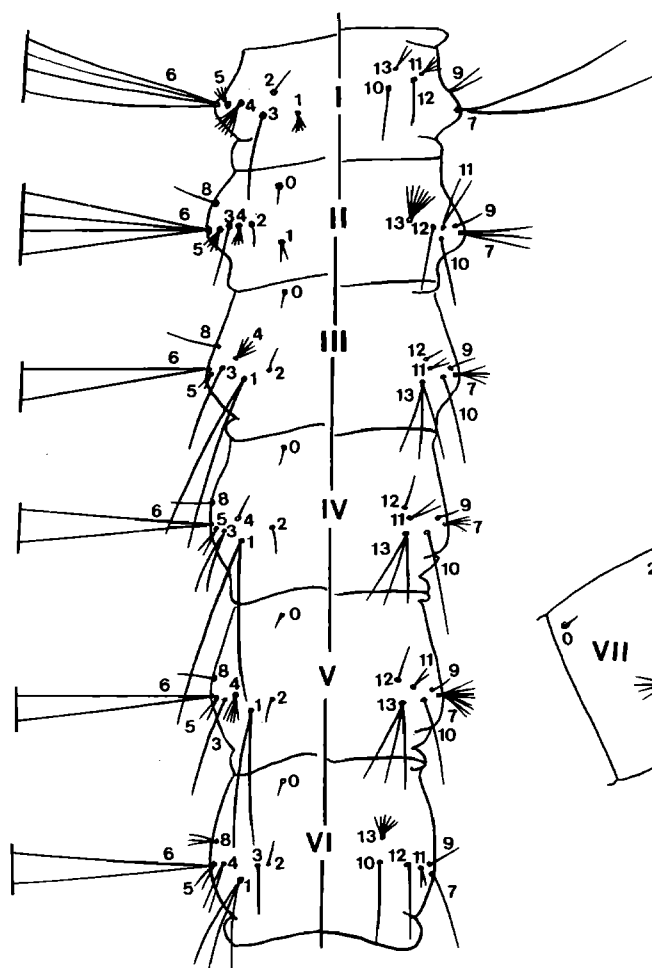


Fig. 7

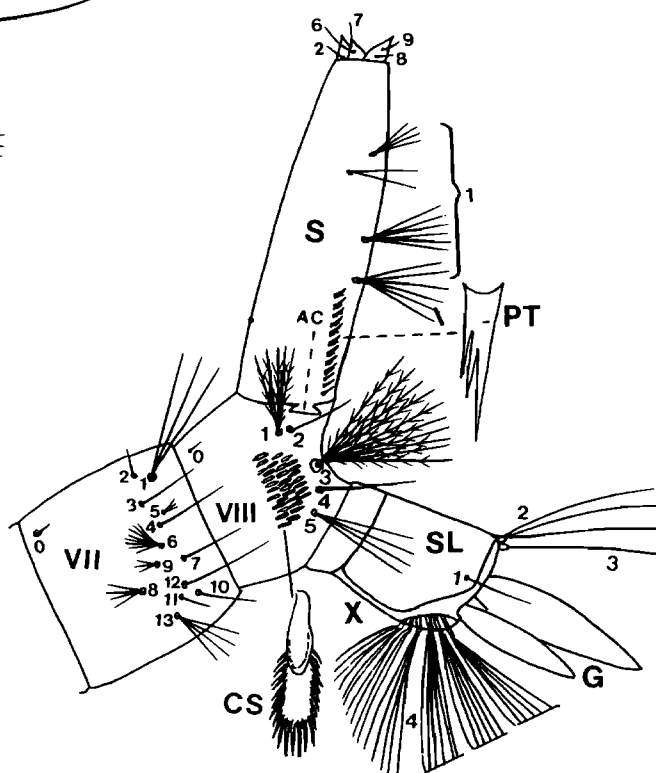


Fig. 8

KEY TO THE GENERA OF CULICIDAE

1. Palmate hairs present on some abdominal segments; air tube absent (Fig. 9)..... *Anopheles*

Palmate hairs absent on abdominal segments;
air tube present (Fig. 10) 2

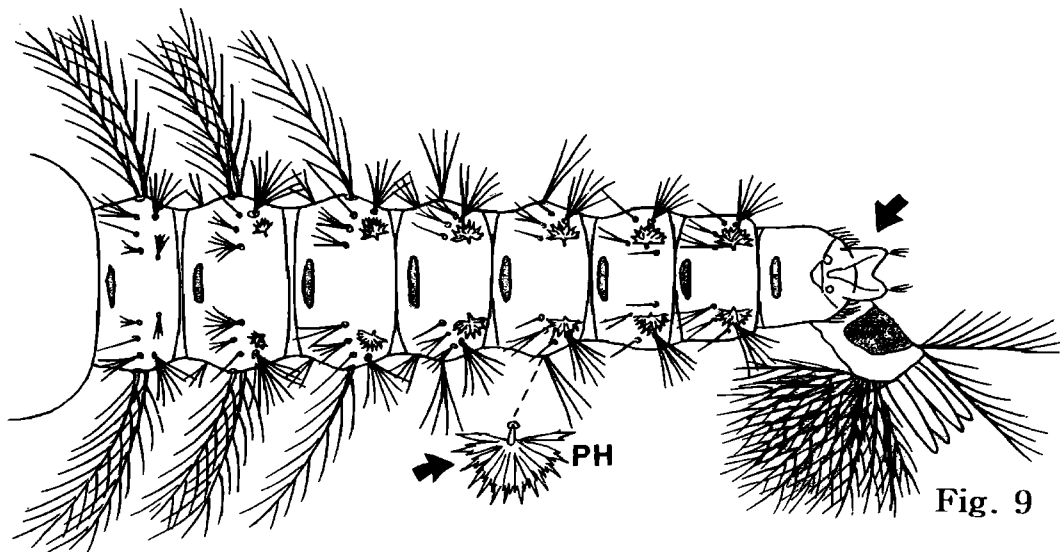


Fig. 9

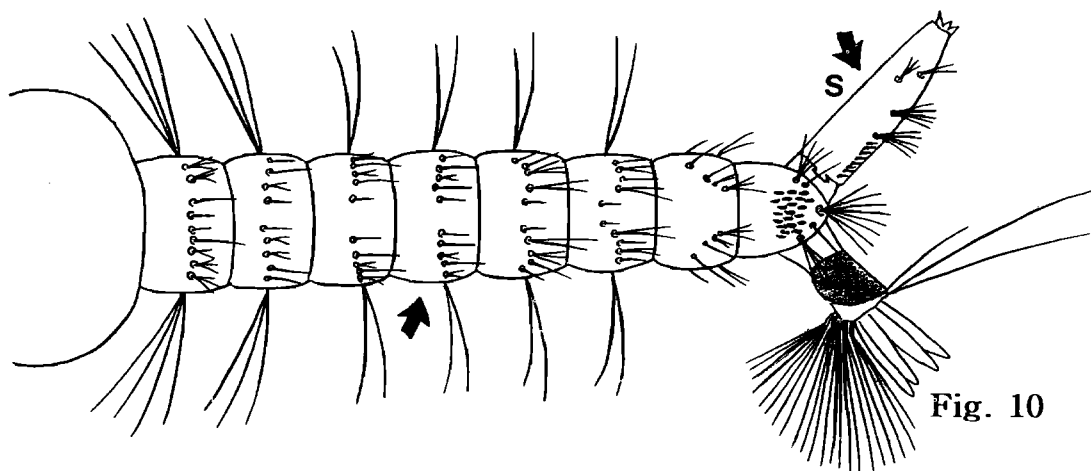


Fig. 10

2. Eighth abdominal segment without comb, but with lateral chitinized plate on each side carrying two strong bristles and some small hairs (Fig. 11) *Toxorhynchites*
(*Tx. christophi*)

Eighth abdominal segment with comb, and
without lateral chitinized plates (Fig. 12)..... 3

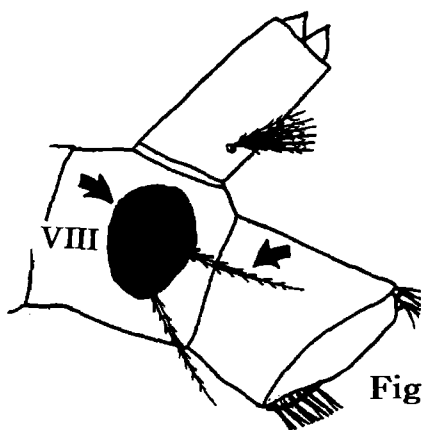


Fig. 11

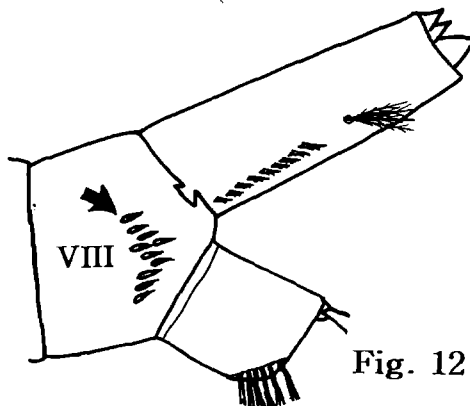


Fig. 12

3. Ventral brush of anal segment represented by
a single pair of hairs (Fig. 13); thoracic
hair 7-T modified into a long spine (Fig. 14) *Tripteroides*
(*Tp. bambusa bambusa*)

Ventral brush of anal segment of more than 8
separate hairs (Fig. 15); thoracic hair 7-T
not modified into a long spine (Fig. 16) 4

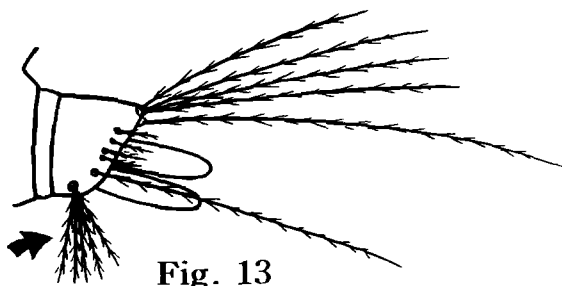


Fig. 13

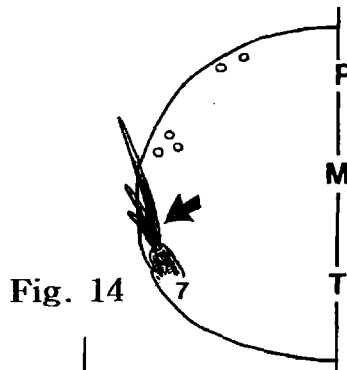


Fig. 14

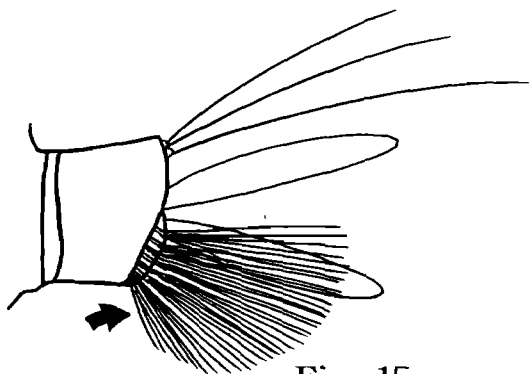


Fig. 15

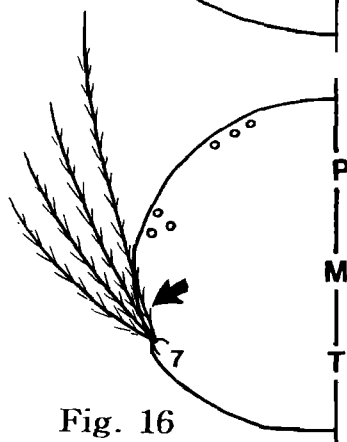


Fig. 16

4. Siphon valves with chitinous hooks (Fig. 17) 5

Siphon valves without hooks (Fig. 18) 6

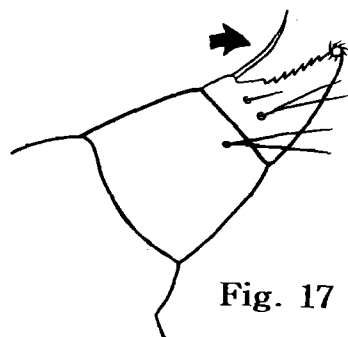


Fig. 17

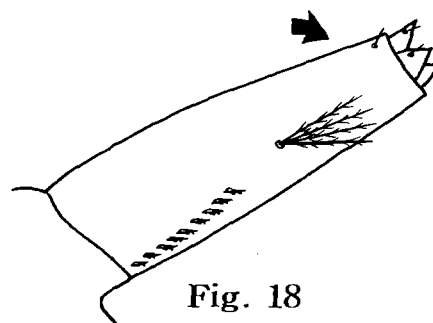


Fig. 18

5. Flagellar segment of antenna very long and flexible (Fig. 19); comb scales 5-10, with apex pectinated (Fig. 20) *Coquillettidia* (Coq.) *ochracea*

Flagellar segment of antenna short and rigid (Fig. 21); comb scales 1-3, with apex rounded (Fig. 22) *Mansonia* (Mnd.) *uniformis*

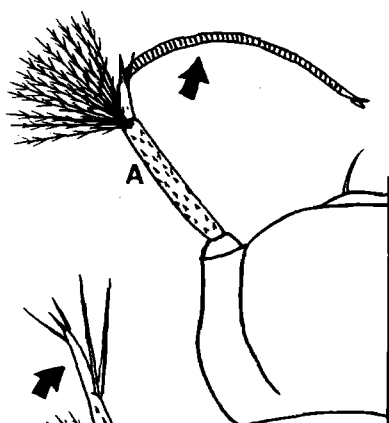


Fig. 19

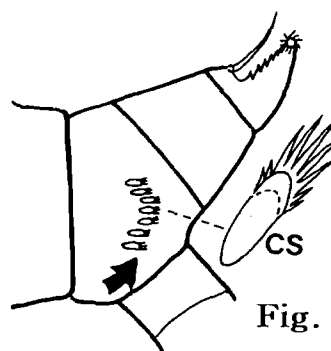


Fig. 20

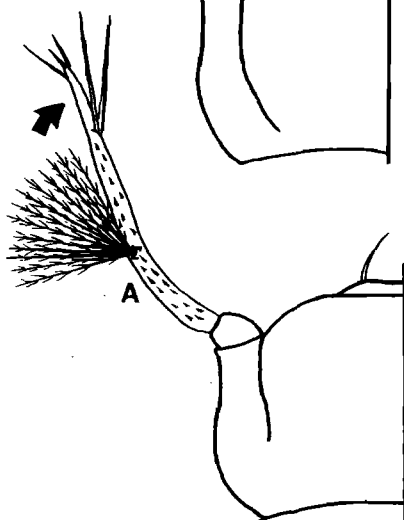


Fig. 21

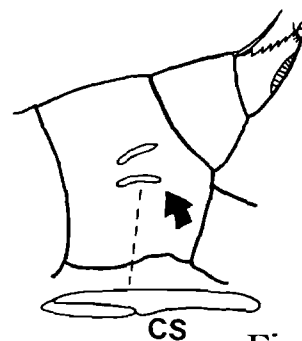
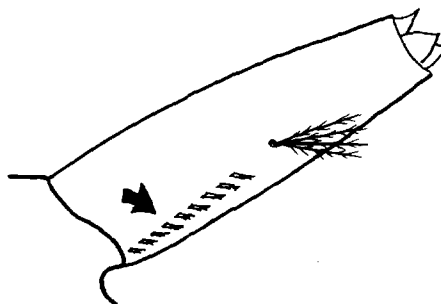
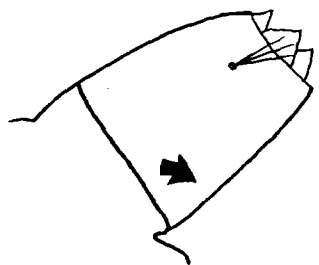


Fig. 22

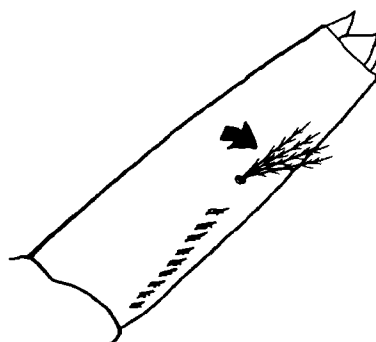
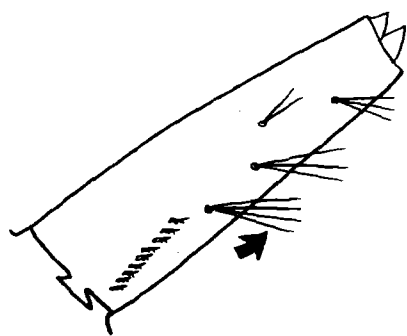
6. Siphon without pecten (Fig.23) *Armigeres*
(*Ar. subalbatus*)

Siphon with pecten (Fig. 24) 7



7. Siphon with more than three pairs
of subventral hair tufts (Fig. 25) *Culex*

Siphon with only one pair of subventral
hair tufts Fig. 26) 8



8. Hair tufts on siphon arising very near
base of siphon (Fig. 27) *Culiseta* (see 9)

Hair tufts on siphon arising in middle
part of siphon (Fig. 28) *Aedes & Heizmannia*

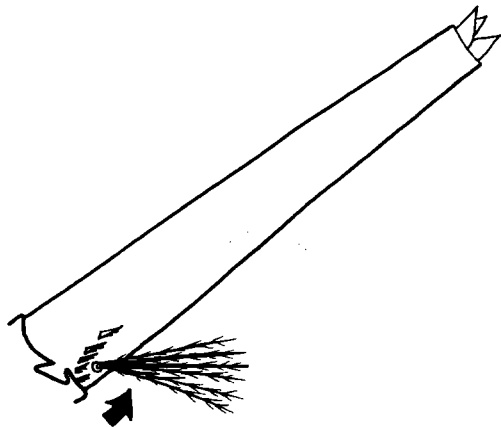


Fig. 27

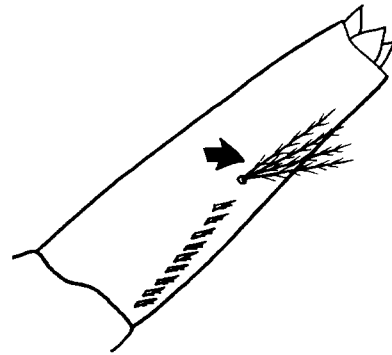


Fig. 28

9. Pecten followed by a row of
numerous simple hairs (Fig. 29) *Cs. (Cus.) bergrothi*

Pecten not followed by such
hairs (Fig. 30) *Cs. (Cuc.) nipponica*

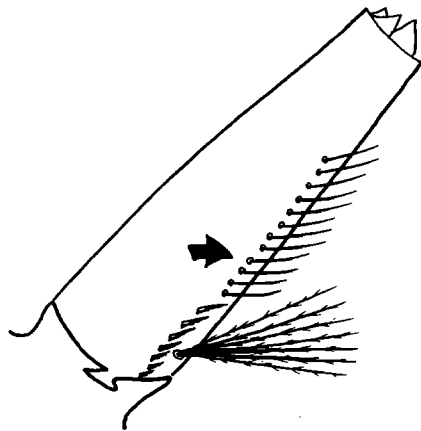


Fig. 29

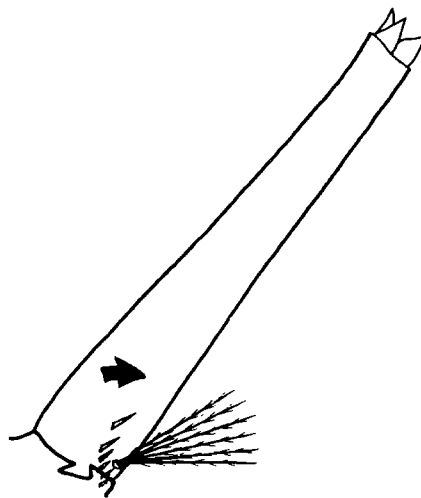


Fig. 30

KEY TO THE SPECIES OF *ANOPHELES*

1. Head hair 3-C single (Fig. 31); thoracic hair 1-P plumose (Fig. 32) *An. lindesayi japonicus*

Head hair 3-C multiple branches (Fig. 33);
thoracic hair 1-P single or 2-4 branches (Fig. 34) 2

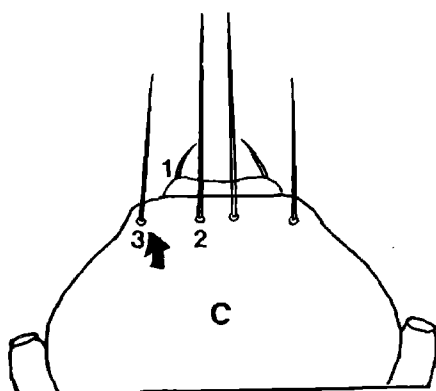


Fig. 31

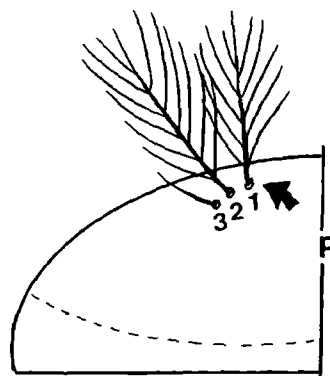


Fig. 32

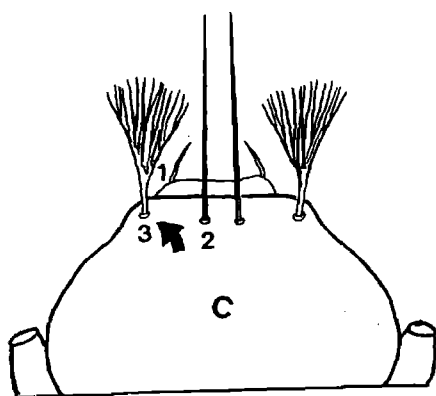


Fig. 33

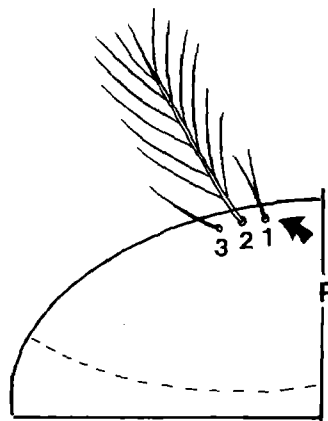


Fig. 34

2. Head hair 3-C with 3-8 branches (Fig. 35) *An. koreicus*

Head hair 3-C with over 10 branches (Fig. 36) 3

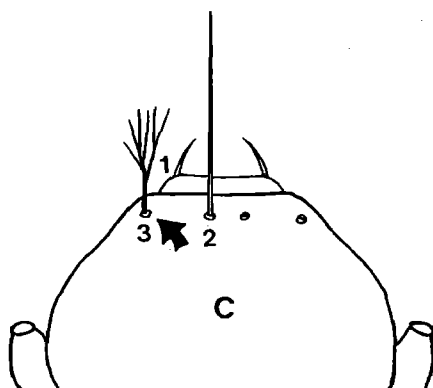


Fig. 35

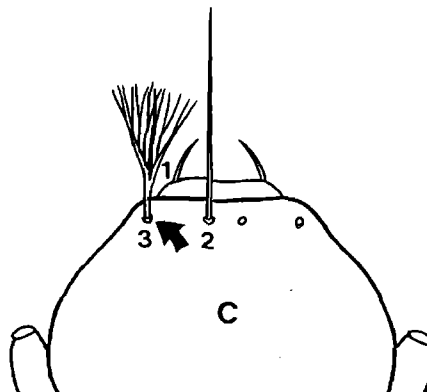


Fig. 36

3. Head hair 3-C with 10-30 branches;
antennal hair 1-A about as long as
 $1/4 - 1/3$ of the antennal shaft,
positioned near base of antenna (Fig. 37) *An. sineroides*

Head hair 3-C with 30-60 branches;
antennal hair 1-A about as long as
 $1/2$ of the antennal shaft, positioned
at middle of antenna (Fig. 38) *An. sinensis*
..... *An. yatsushiroensis*
..... *An. pullus*
..... *An. lesteri*

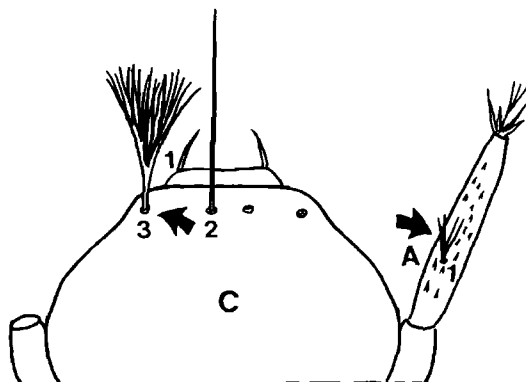


Fig. 37

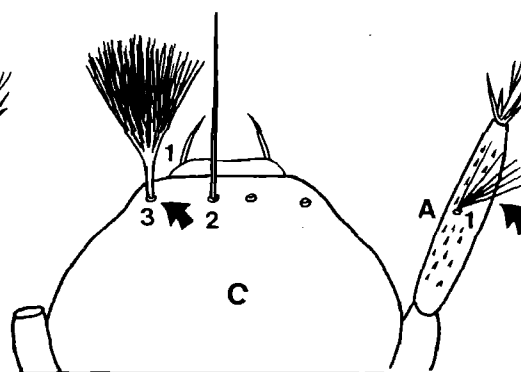


Fig. 38

KEY TO THE SPECIES OF *CULEX*

1. Siphon as long as saddle; pecten and ventral hairs extending to nearly apex of siphon (Fig. 39) *Cx. halifaxii* &
Cx. fuscus
- Siphon at least twice as long as saddle; pecten confined to basal half of siphon (Fig. 40) 2

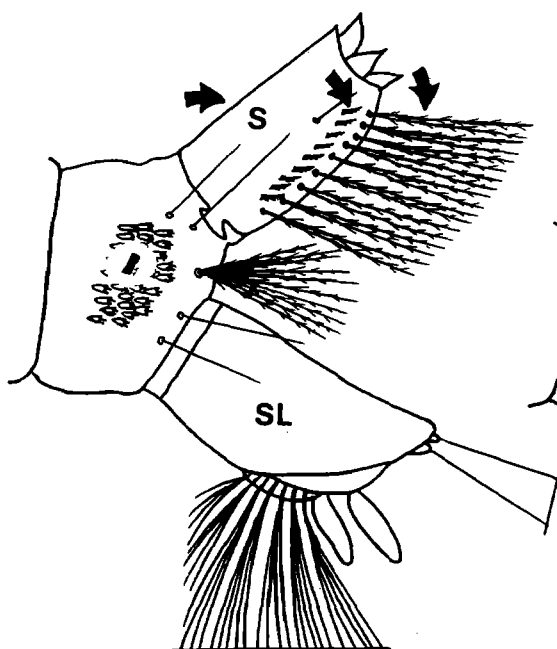


Fig. 39

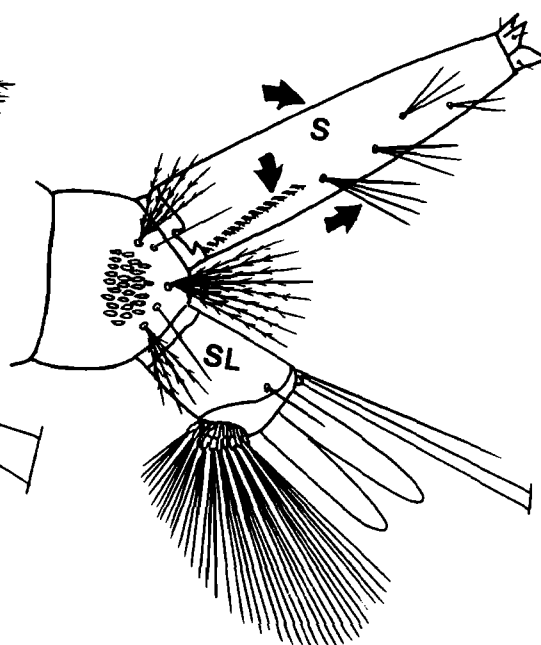


Fig. 40

2. Thoracic hair 3-P definitely shorter than 1, 2-P and single or branched (Fig. 41) 3
- Thoracic hair 3-P as long as 1, 2-P and single or bibranched (Fig. 42) 6

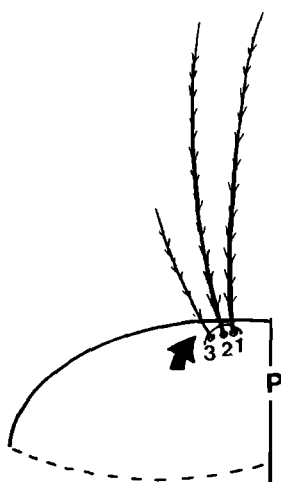


Fig. 41

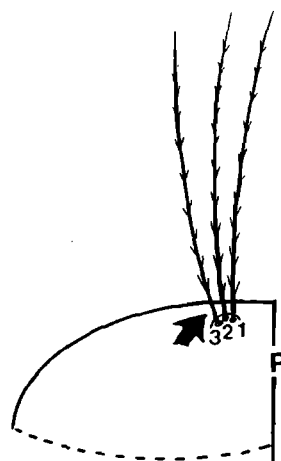


Fig. 42

3. Thoracic hair 4-P slender, branched and shorter than 3-P (Fig. 43) *Cx. hayashii hayashii*

Thoracic hair 4-P stout, bibranched and longer than 3-P (Fig. 44) 4

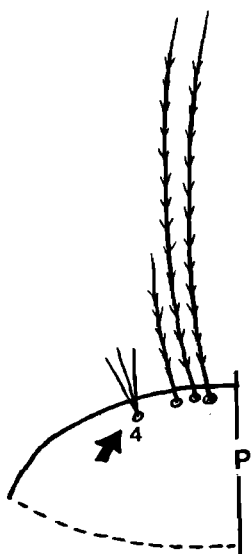


Fig. 43

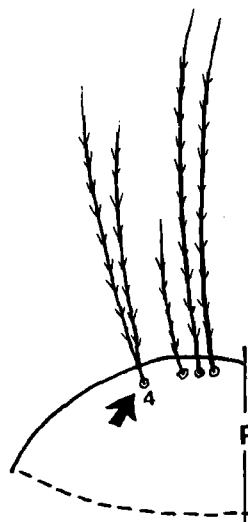


Fig. 44

4. Thoracic hair 3-P slender, branched and very short (Fig. 45) *Cx. rubensis*

Thoracic hair 3-P moderately stout, single or bibranched and distinctly shorter than 1, 2-P (Fig. 46) 5

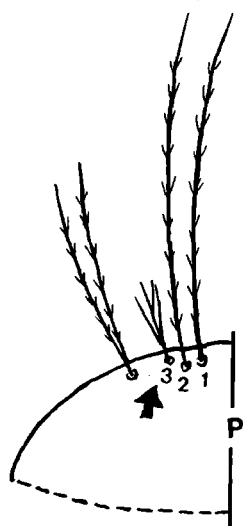


Fig. 45

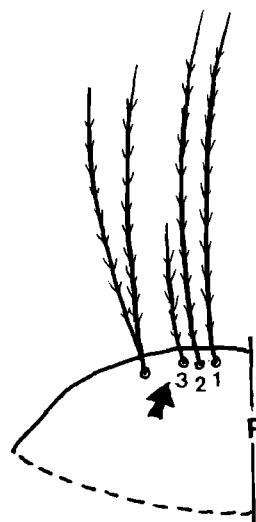


Fig. 46

5. Thoracic hairs 1, 3-P usually bibranched, (Fig. 47) .. *Cx. sasai*

Thoracic hairs 1, 3-P usually single, (Fig. 48) .. *Cx. infantulus*

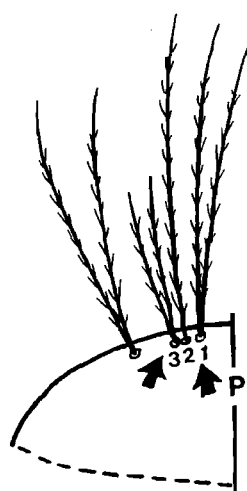


Fig. 47

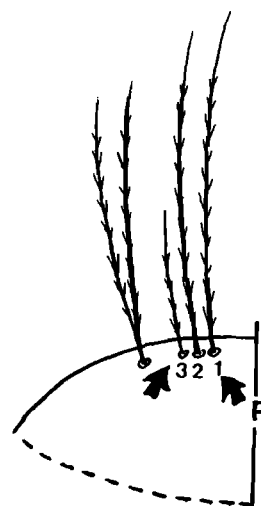


Fig. 48

6. Thoracic hairs 1, 3-P bibranchied (Fig. 49) *Cx. kyotoensis*

Thoracic hairs 1,3-P single (Fig. 50)..... 7

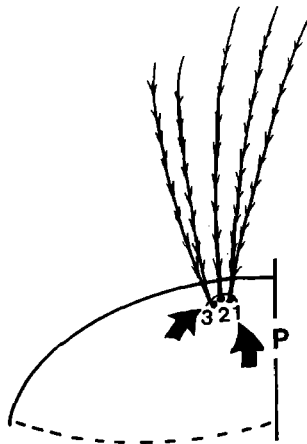


Fig. 49

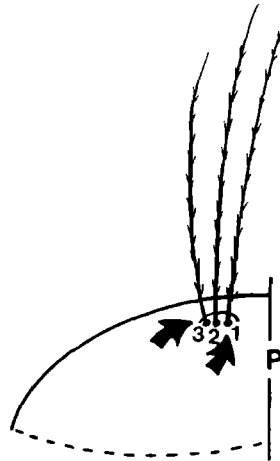


Fig. 50

7. Head hair 1-C slender and brown (Fig. 51) 8

Head hair 1-C stout and darker (Fig. 52) 11

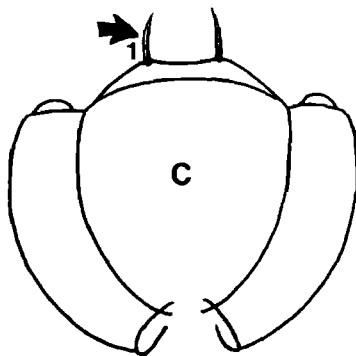


Fig. 51

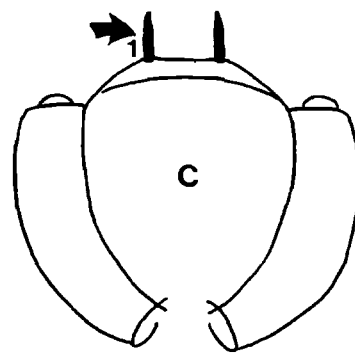


Fig. 52

8. Siphon hair tufts strong, arranged in a zigzag, almost ventral row and evenly spaced, siphon without lateral hair tuft (Fig. 53) *Cx. inatomii*

Siphon hair tufts weak, arranged usually in a regular subventral row, siphon with lateral hair tuft (Fig. 54) 9

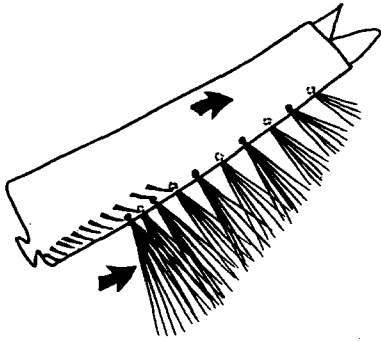


Fig. 53

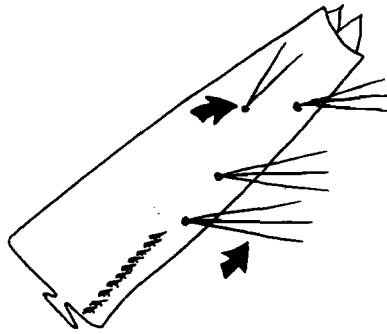


Fig. 54

9. Siphon with 4 pairs of subventral hairs; siphon long, usually 4 to 5 times longer than its basal width (Fig. 55) *Cx. vagans*

Siphon with 3 pairs of subventral hairs; siphon short, approximately 3 times longer than its basal width (Fig. 56) 10

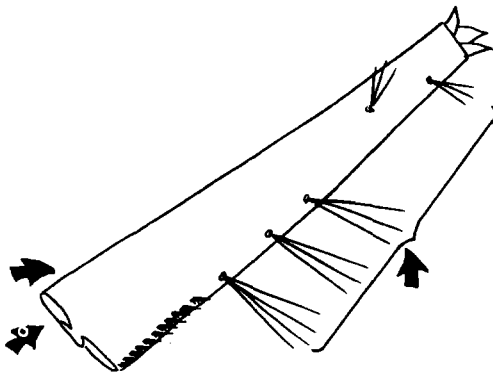


Fig. 55

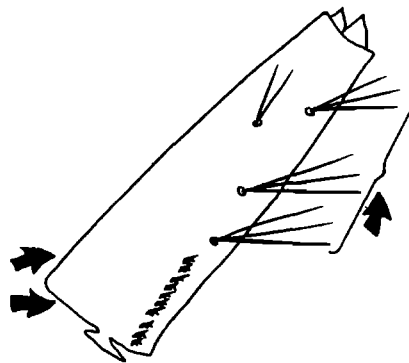


Fig. 56

12. Pecten with 1-8 teeth; siphon without lateral hair tuft (Fig. 61) 13

Pecten with 6-14 teeth; siphon with lateral hair tuft (Fig. 62) 14

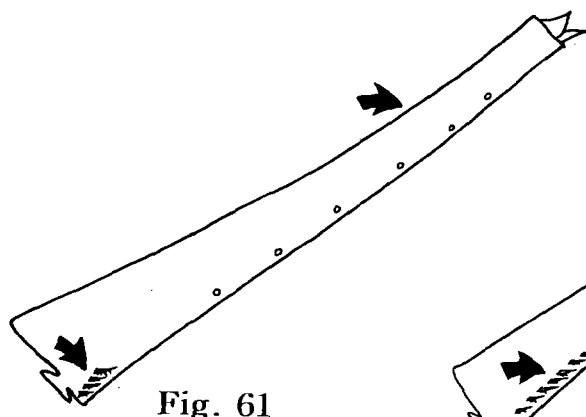


Fig. 61

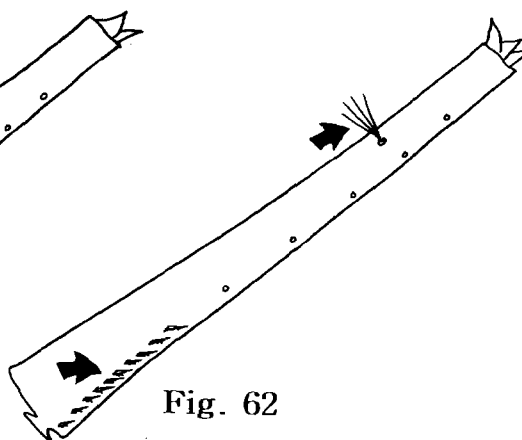


Fig. 62

13. Mentum plate with extremely small and numerous teeth (Fig. 63); thoracic hair 4-P long, barbed (Fig. 64); siphon with 4 pairs of subventral hair tufts (Fig. 65) *Cx. bitaeniorhynchus*

Mentum plate with coarse apical teeth, diminishing gradually toward base (Fig. 66); thoracic hair 4-P short, smooth (Fig. 67); siphon with 6 pairs of subventral hair tufts (Fig. 68) *Cx. sinensis*

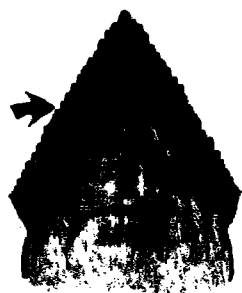


Fig. 63

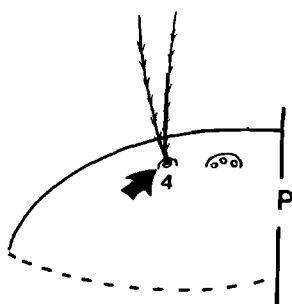


Fig. 64

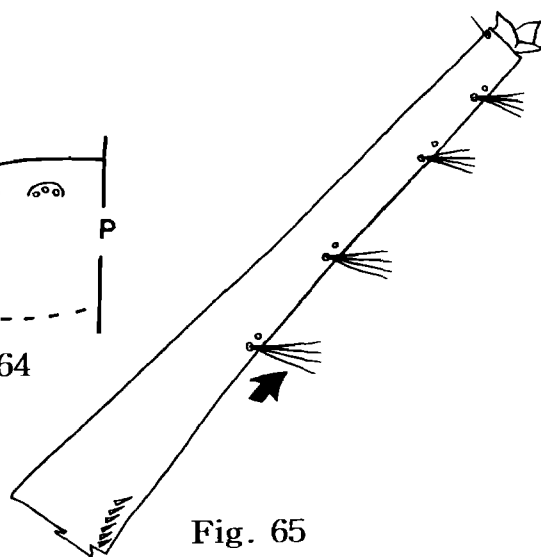


Fig. 65



Fig. 66

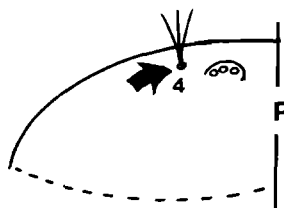


Fig. 67

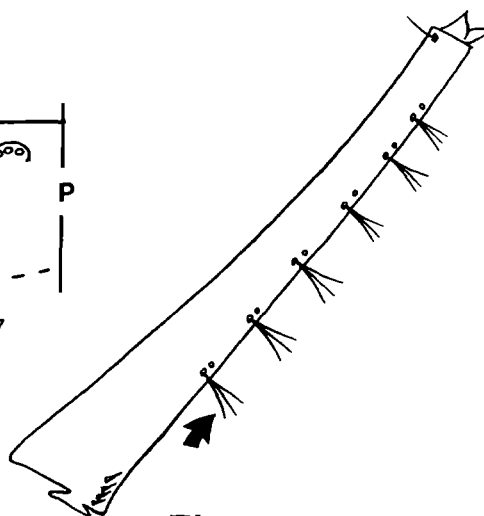


Fig. 68

14. Subventral hairs of siphon about half as long as siphon (Fig. 69) *Cx. whitmorei*

Subventral hairs of siphon less than half as long as siphon (Fig. 70) *Cx. pseudovishnui*

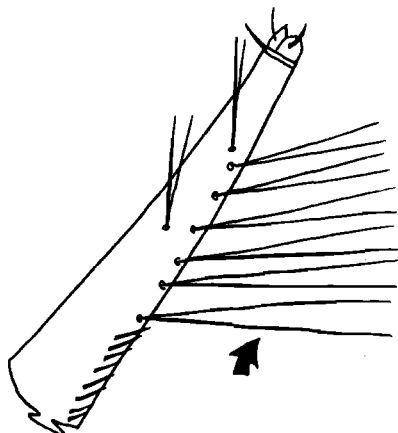


Fig. 69

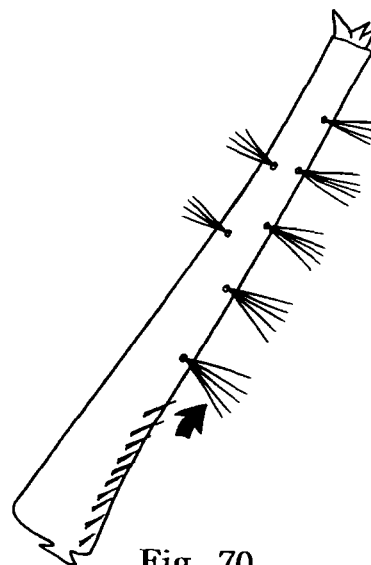


Fig. 70

15. Head hair 1-C very thick, rather blunt (Fig. 71);
anal gills very short and rounded, slightly longer
than wide (Fig. 72) *Cx. sitiens*

Head hair 1-C not thick, sharply pointed (Fig. 73);
anal gills at least 3 times as wide, usually longer
than anal segment (Fig. 74) 16

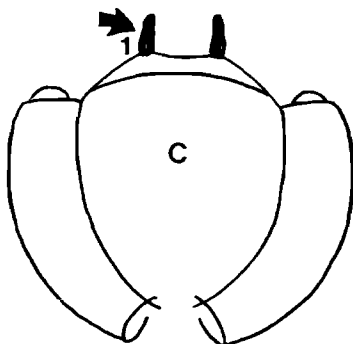


Fig. 71

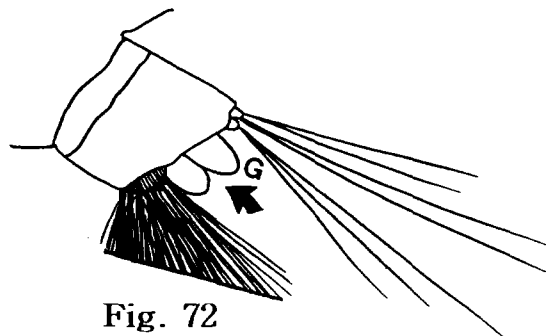


Fig. 72

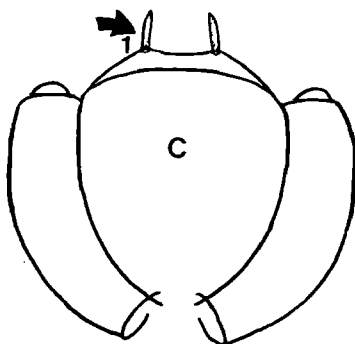


Fig. 73

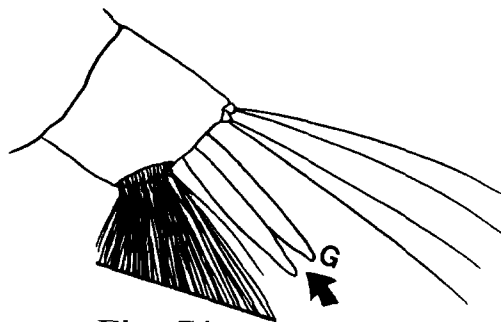
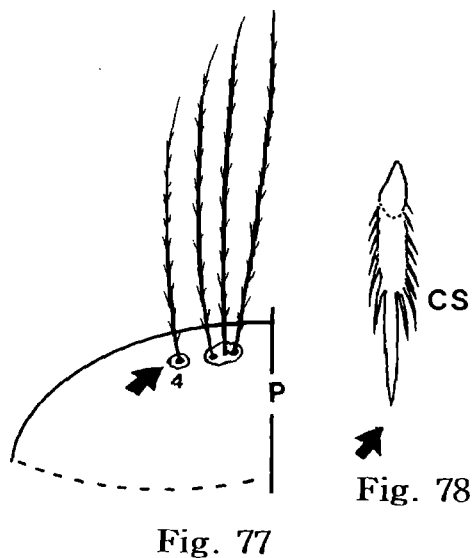
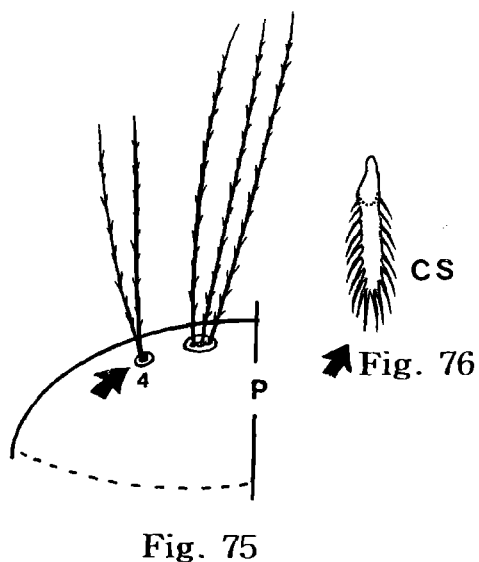


Fig. 74

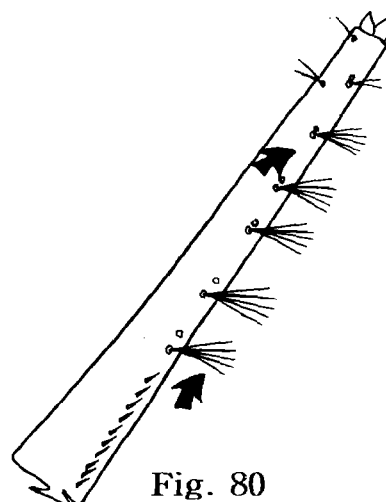
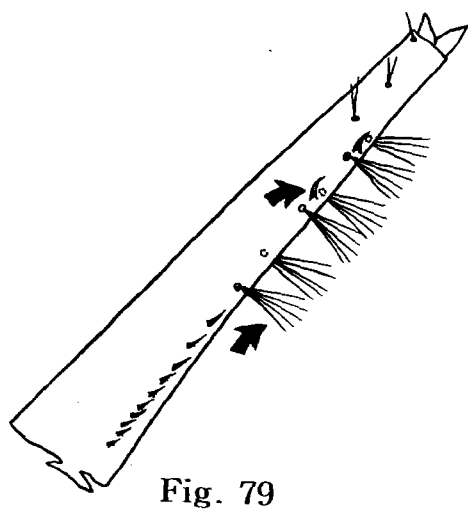
16. Thoracic hair 4-P bibranchied (Fig. 75);
comb scales fringed apically and
laterally (Fig. 76) *Cx. tritaeniorhynchus*

Thoracic hair 4-P single (Fig. 77); comb scales
pectinate on each side with spiniform tip (Fig. 78) 17



17. Siphon with 6-8 subventral hair tufts in a zigzag row; 2 pairs of strong subventral spines on apical half of siphon tube (Fig. 79) *Cx. jacksoni*

Siphon with 10-14 subventral hair tufts, in a zigzag row basally, more paired apically; strong spines absent on siphon tube (Fig. 80) 18



18. Head hair 4-C 3-5 branched (Fig. 81); thoracic hair 13-T 1-3 branched (Fig. 82) *Cx. mimeticus*

Head hair 4-C 1-2 branched (Fig. 83);
thoracic hair 13-T usually more than
10 branched (Fig. 84) *Cx. orientalis*

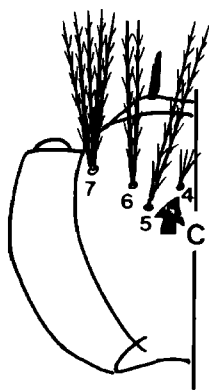


Fig. 81

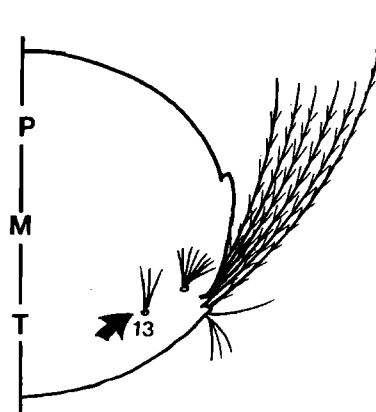


Fig. 82

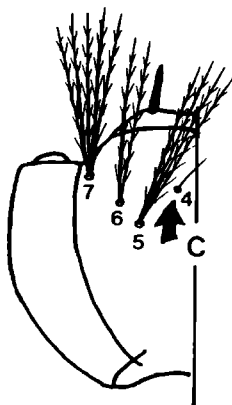


Fig. 83

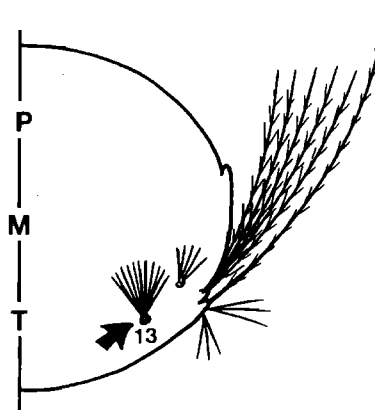


Fig. 84

KEY TO THE SPECIES OF *AEDES* AND *HEIZMANNIA*

1. 3-20 large comb scales in a single row, or in an irregular row, or more or less in 2 rows (Fig. 85) 2

20-70 comb scales usually smaller, arranged in several rows, or more or less in a triangular patch (Fig. 86) 12

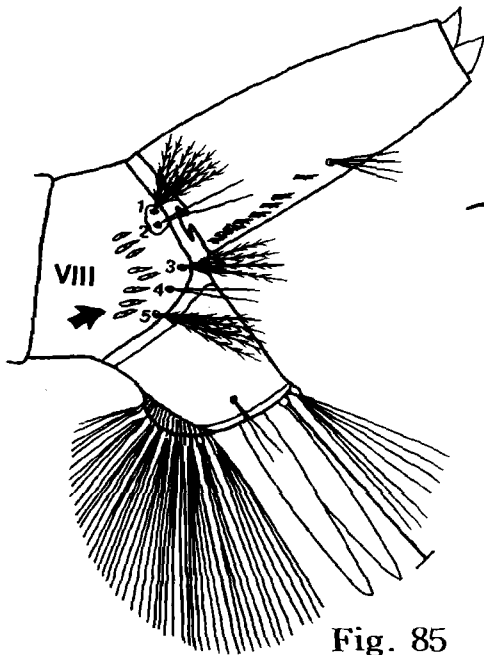


Fig. 85

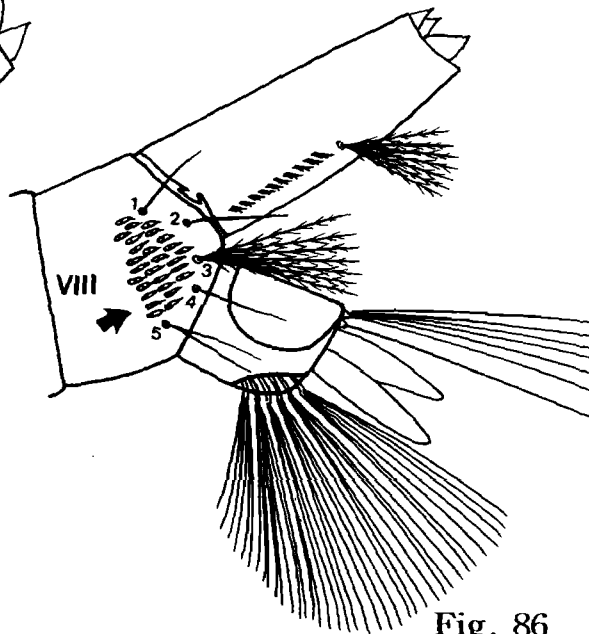


Fig. 86

2. Antennal shaft smooth (Fig. 87) 3

Antennal shaft with small spicules or spines (Fig. 88)..... 6

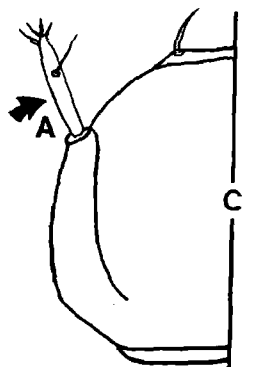


Fig. 87

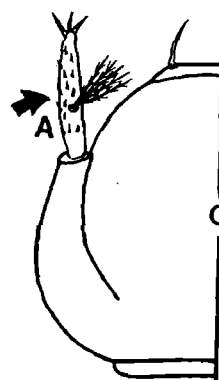


Fig. 88

3. Comb scales with 2-4 strong basal lateral spines on each side (Fig. 89) *Ae. chemulpoensis*

Comb scales without basal lateral spines, but finely fringed (Fig. 90) 4

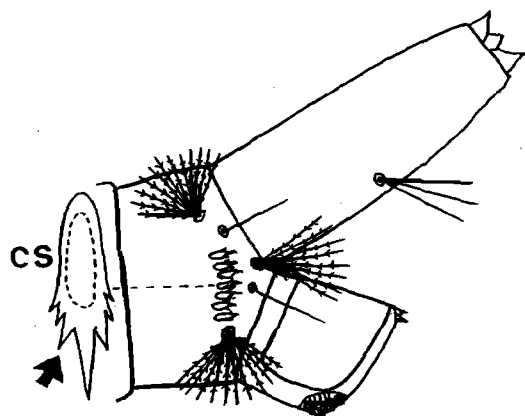


Fig. 89

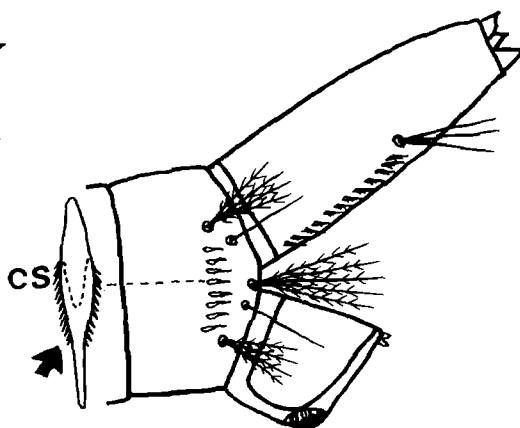


Fig. 90

4. Abdominal hairs 1, 5-VIII with less than 4 branches (Fig. 91) *Ae. albopictus*

Abdominal hairs 1, 5-VIII with more than 6 branches (Fig. 92) 5

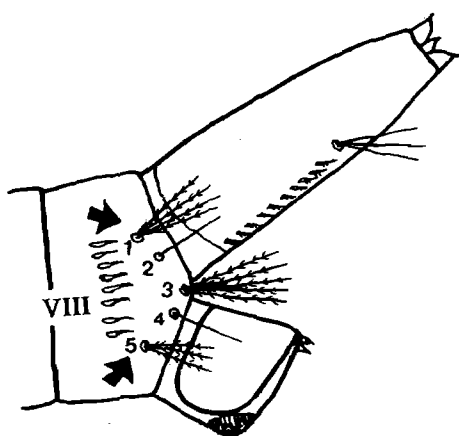


Fig. 91

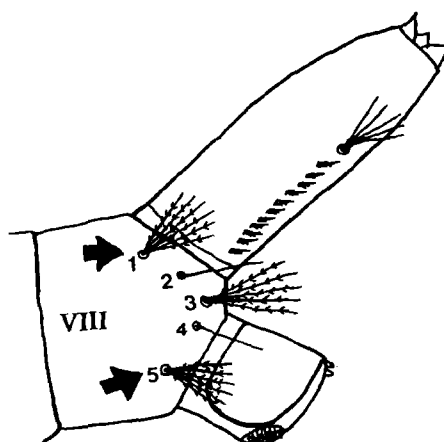


Fig. 92

5. Thoracic hair 14-P with more than 4 branches (Fig. 93);
saddle incomplete (Fig. 94) *Ae. flavopictus flavopictus*

Thoracic hair 14-P with 2 branches (Fig. 95);
saddle usually complete (Fig. 96) *Ae. galloisi*

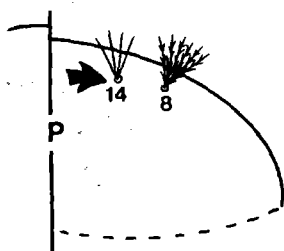


Fig. 93

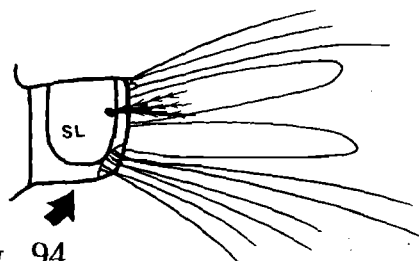


Fig. 94

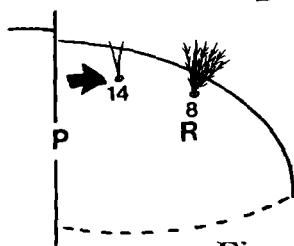


Fig. 95

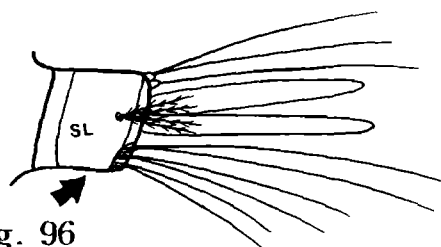


Fig. 96

6. All pecten teeth evenly spaced and all about same size (Fig. 97); head hair 4-C as large as 5-C (Fig. 98) *Ae. nipponicus*

The 1-3 pecten teeth furthest from base of siphon more widely spaced than basal teeth (Fig. 99);
head hair 4-C much smaller than 5-C (Fig. 100) 7

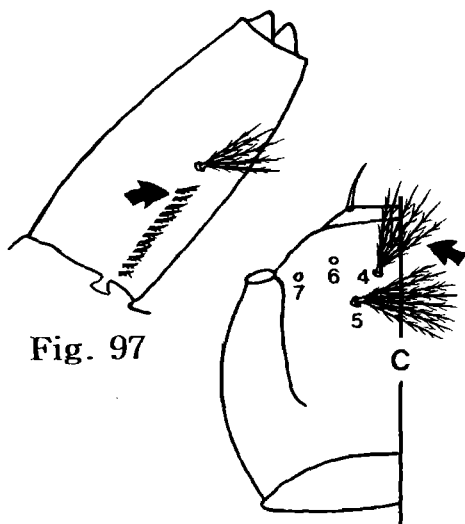


Fig. 97

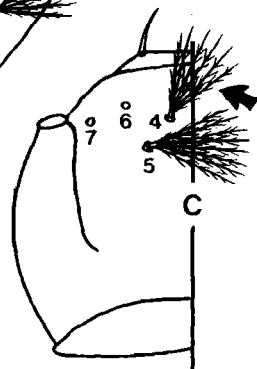


Fig. 98

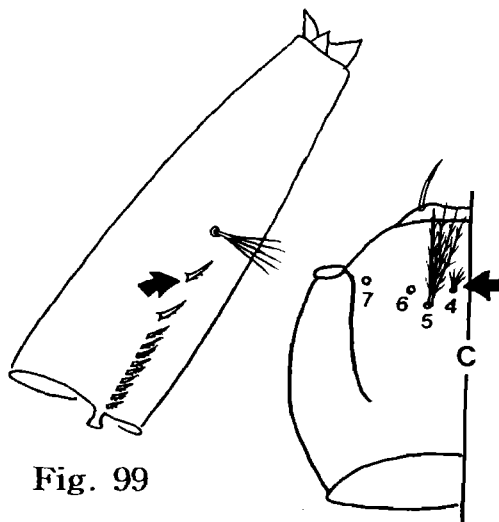


Fig. 99

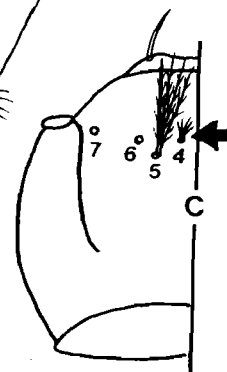


Fig. 100

7. Siphon with minute, 2-5 branched hairs near apex (Fig. 101) *Ae. esoensis*

Siphon without minute hair near apex (Fig. 102) 8

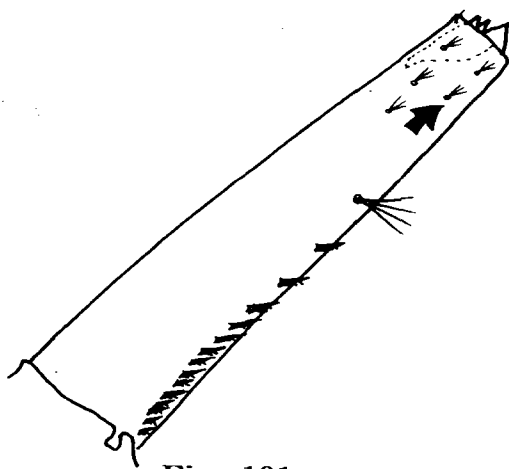


Fig. 101

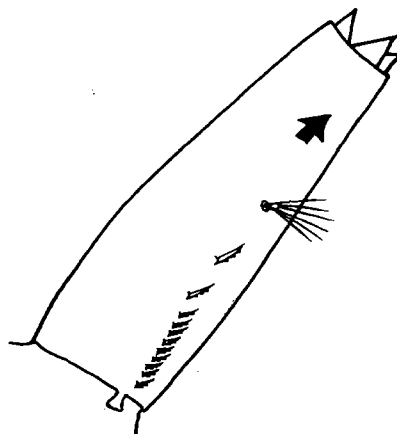


Fig. 102

8. Head hair 6-C single or bifid; 5, 6, 7-C not on a line (Fig. 103) 9

Head hair 6-C with 5 or more branches; 5, 6, 7-C on a line (Fig. 104) 10

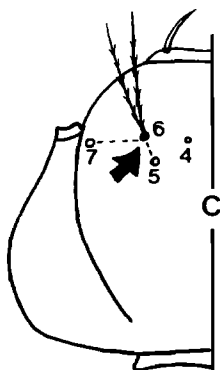


Fig. 103

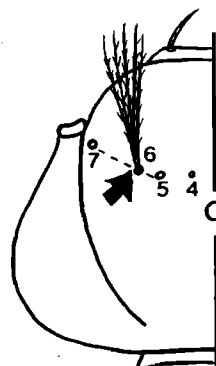


Fig. 104

9. Frontoclypeus of head with granules (Fig. 105) *vexans vexans*

Frontoclypeus of head without granules (Fig. 106) *vexans nipponii*

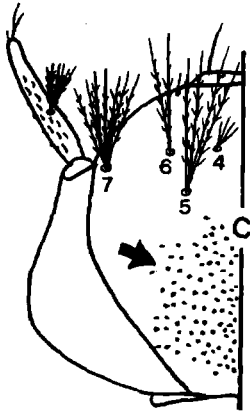


Fig. 105

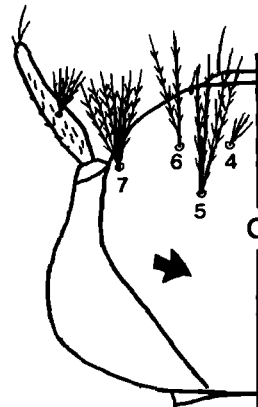


Fig. 106

10. Comb scales 16-20 (usually 20) in a patch, individual scales rounded, evenly fringed laterally and apically with spicules (Fig. 107) *Ae. alboscuteUatus*

Combscales 8-12 in an irregular row, individual scales thorn shaped, with apparently 8-10 short, stiff, subequal basolateral spicules on each side (Fig. 108) 11

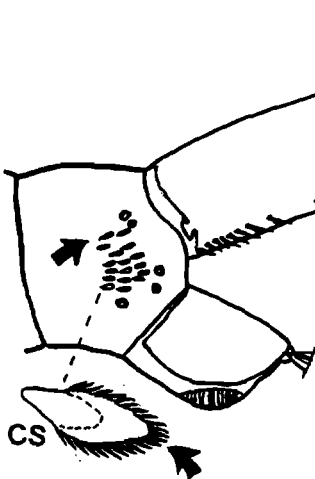


Fig. 107

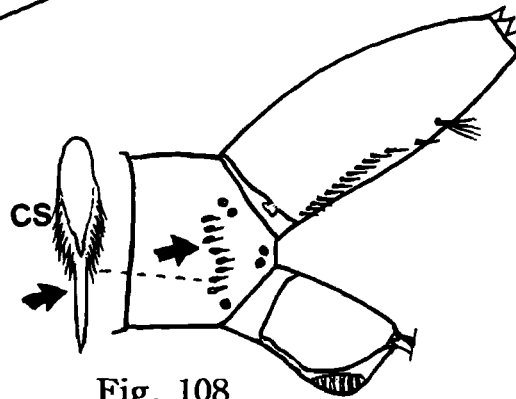


Fig. 108

11. Siphon stout at the middle; saddle narrowly incomplete; 1-X usually single, about 0.5 saddle length, inserted at posterior margin of the saddle (Fig. 109) *Ae. lineatopennis*

Siphon not stout at the middle; saddle widely incomplete; 1-X very short, usually triple and inserted at subposterior margin of the saddle (Fig. 110) *Ae. bekkui*

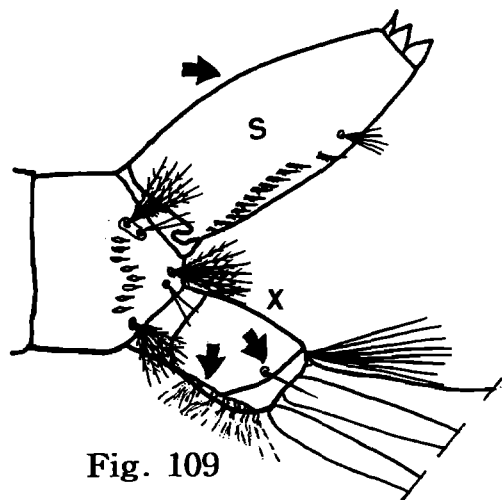


Fig. 109

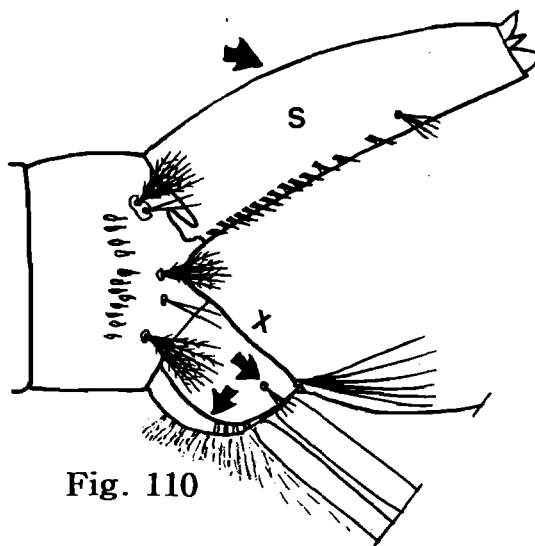


Fig. 110

12. Thoracic setae 1-M and 1-T very stout, on sclerotized basal callus (Fig. 111) *Ae. hatorii*

Thoracic setae 1-M and 1-T weak, not on sclerotized basal callus (Fig. 112) 13

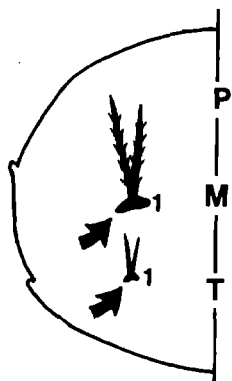


Fig. 111

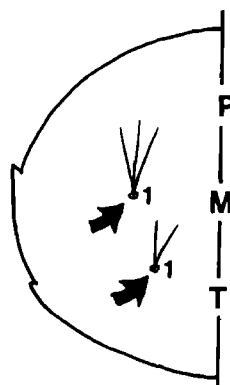


Fig. 112

13. Head hair 6-C very long, longer than head length (Fig. 113) *Ae. alektorovi*

Head hair 6-C not longer than head length (Fig. 114) 14

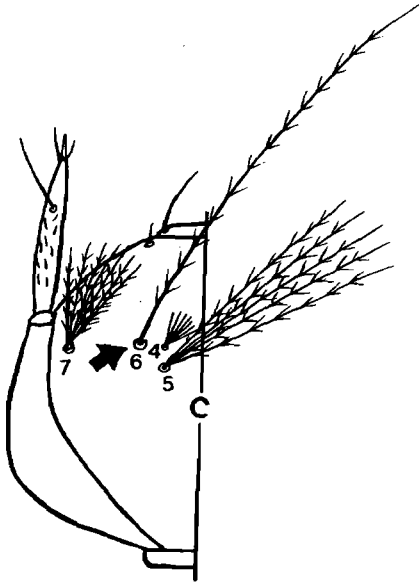


Fig. 113

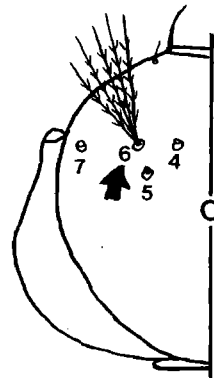


Fig. 114

14. Pecten teeth fringed on both side (Fig. 115) *Ae. seoulensis*

Pecten teeth with basal spines on one side (Fig. 116) 15

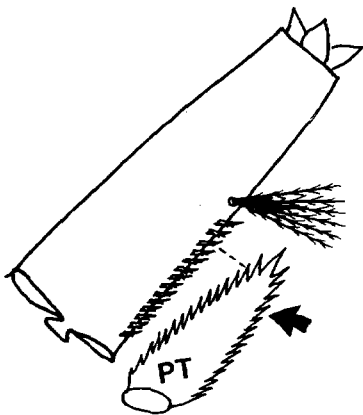


Fig. 115

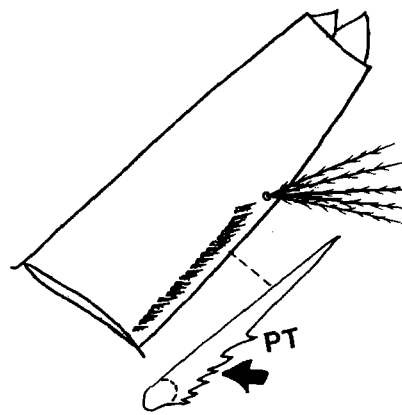


Fig. 116

15. Head hair 5-C single (Fig. 117) 16
 Head hair 5-C branched (Fig. 118) 17

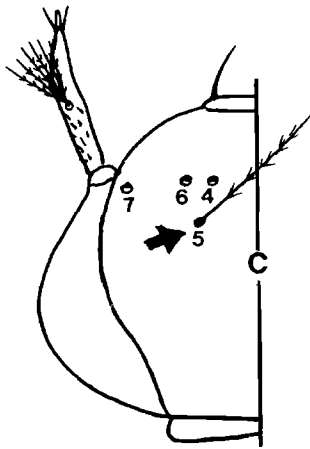


Fig. 117

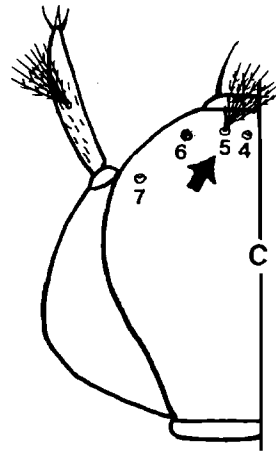


Fig. 118

16. Head hair 6-C branched; antennal
 hair 1-A single (Fig. 119) *Ae. oreophilus*
 Head hair 6-C single; antennal
 hair 1-A branched (Fig. 120) *Ae. dorsalis*

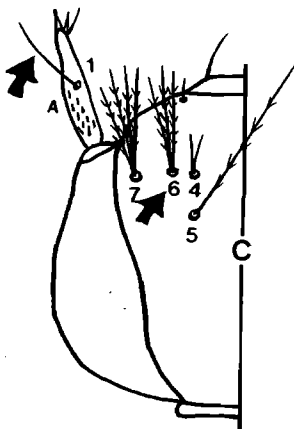


Fig. 119

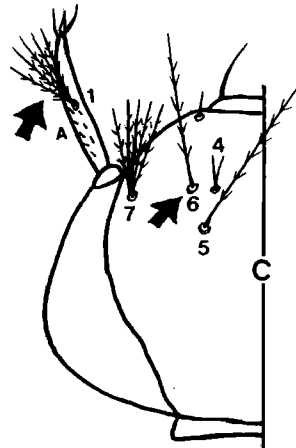


Fig. 120

17. Head hair 6-C with 2 branches; 4-C
nearly as long as 5-C (Fig. 121) *Heizmannia lüi*
- Head hair 6-C with several branches;
4-C smaller than 5-C (Fig. 122) 18

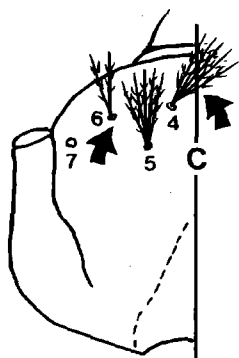


Fig. 121

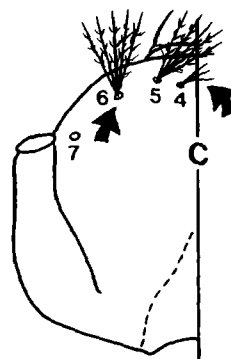


Fig. 122

18. Siphonal hair near apex; anal gills
very short and round (Fig. 123) *Ae. togoi*
- Siphonal hair toward middle of siphon;
anal gills at least 3 times as long as
wide (Fig. 124) 19

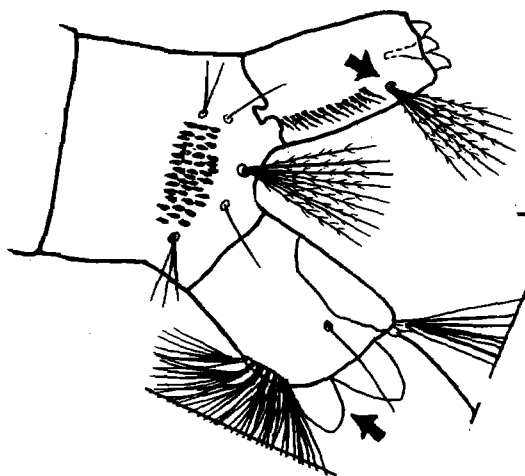


Fig. 123

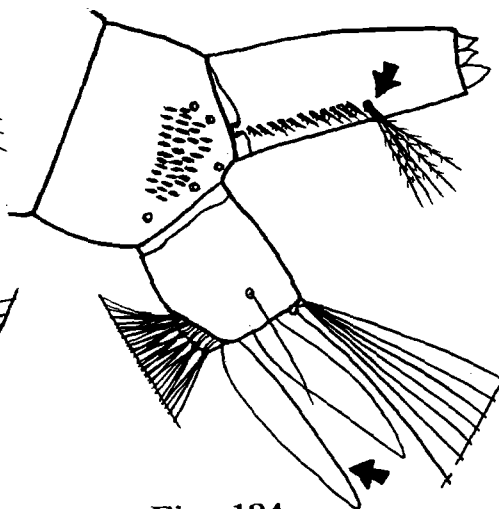


Fig. 124

19. Pecten with distal teeth widely spaced,
extending beyond siphon hair to near
apex (Fig. 125) *Ae. japonicus japonicus*

Pecten with all teeth more or less evenly
spaced, not extending beyond siphon hair
(Fig. 126) *Ae. koreicus*

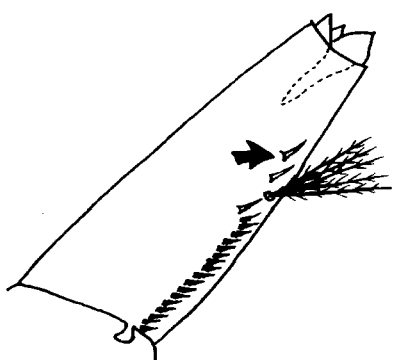


Fig. 125

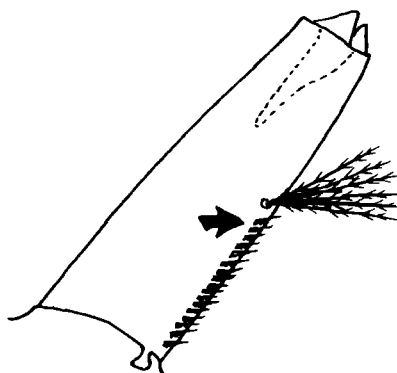


Fig. 126