DICHOTOMOUS KEY

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What is a dichotomous key?

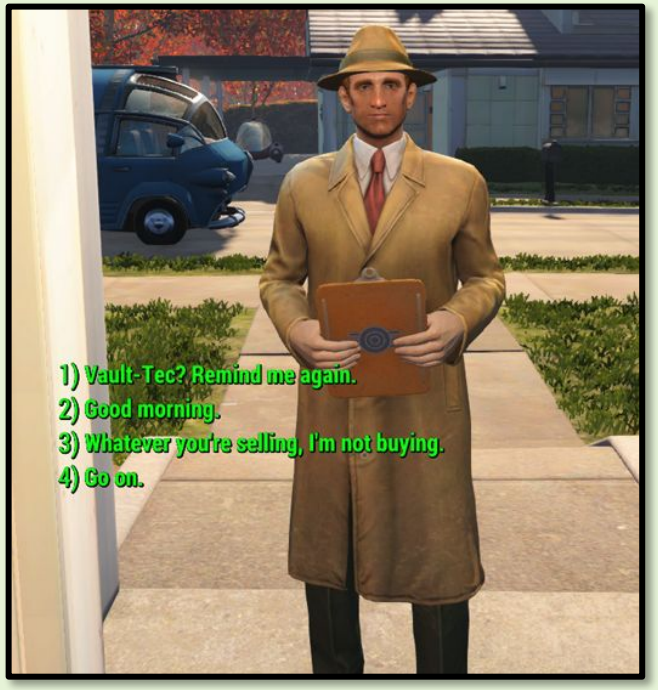
MERIUM WEBSTER SAYS:

dichotomous key noun

: a key for the identification of organisms based on a series of choices between alternative characters

DICHOTOMOUS KEY

CHOICES



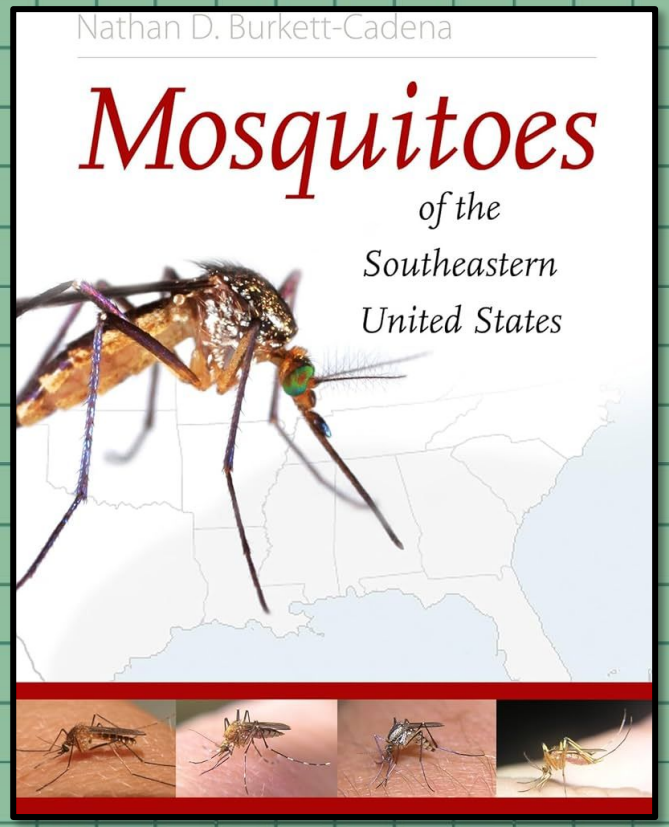
DICHOTOMOUS KEY

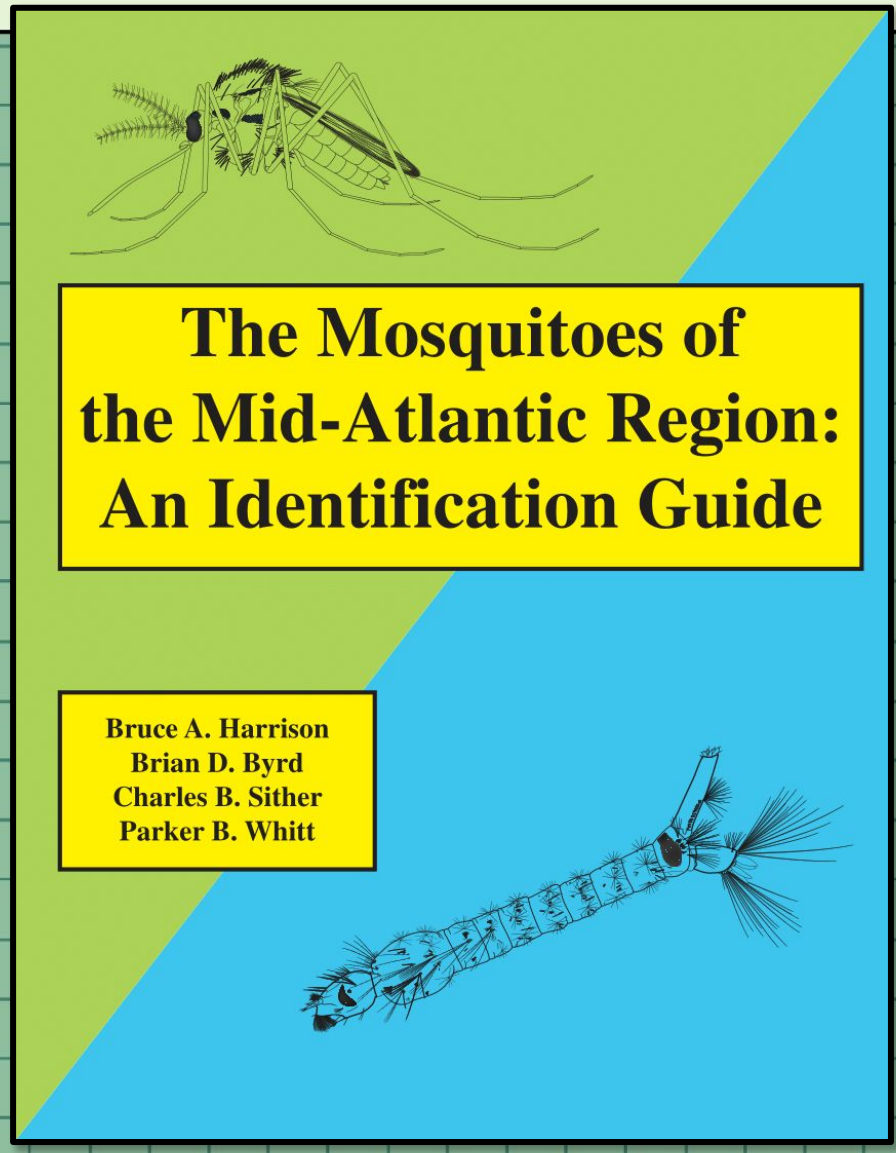
CHOICES

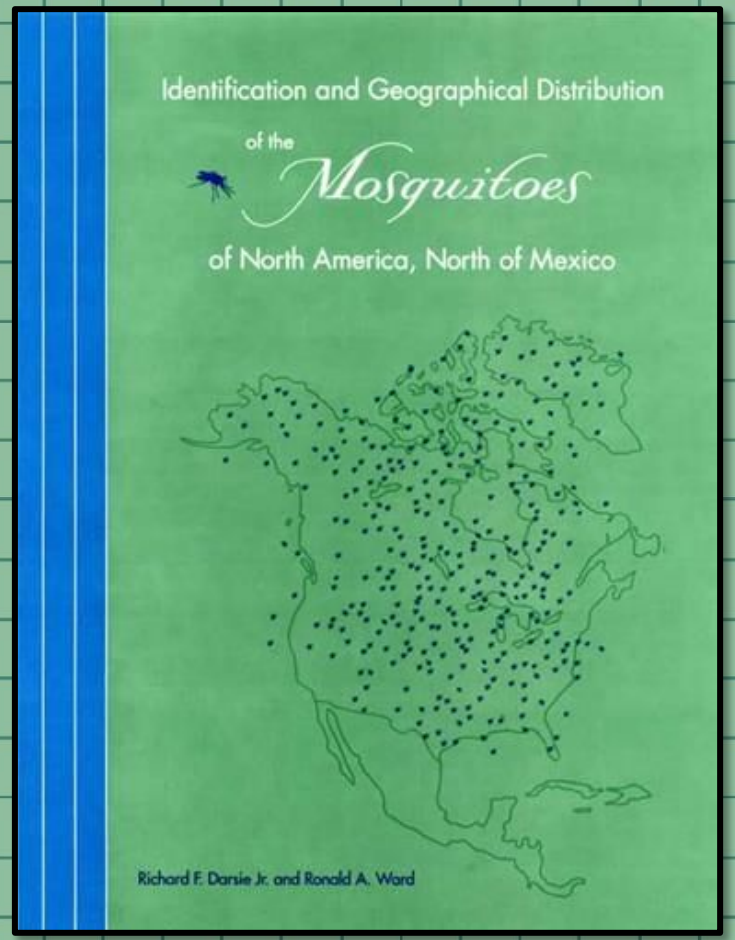
1.	Has green colored body .....go to 2
	Has purple colored body ..... go to 4
2.	Has 4 legs .....go to 3
	Has 8 legs ..... *Deerus octagis*
3.	Has a tail ..... *Deerus pestis*
	Does not have a tail ..... *Deerus magnus*
4.	Has a pointy hump ..... *Deerus humpis*
	Does not have a pointy hump.....go to 5
5.	Has ears .....*Deerus purplinis*
	Does not have ears .....*Deerus deafus*

1.	a. Needle leaves	go to 2
	b. Non-needle leaves	go to 3
2.	a. Needles are clustered	Pine
	b. Needles are in singlets	Spruce
3.	a. Simple leaves (single leaf)	go to 4
	b. Compound leaves (made of "leaflets")	go to 7
4.	a. Smooth edged	go to 5
	b. Jagged edge	go to 6
5.	a. Leaf edge is smooth	Magnolia
	b. Leaf edge is lobed	White Oak
6.	a. Leaf edge is small and tooth-like	Elm
	b. Leaf edge is large and thorny	Holly
7.	a. Leaflets attached at one single point	Chestnut
	b. Leaflets attached at multiple points	Walnut

DICHOTOMOUS KEY







DICHOTOMOUS KEY

The Mosquitoes of the Mid-Atlantic

SCAN ME

DICHOTOMOUS KEY

KEYS ARE ORGANIZED AS DICHOTOMOUS COUPLETS

- MUST PICK BETWEEN TWO CHOICES
- A COUPLET IS A PAIRED SELECTION BASED ON THE MORPHOLOGY OF THE MOSQUITO

ONCE A CHOICE IS MADE, THE USER WILL CONTINUE TO THE NEXT COUPLET AND SO FORTH, UNTIL THEY ARE FINALLY OFFERED A GENUS/SPECIES SELECTION

<u>KNOWLEDGE OF MOSQUITO ANATOMY AND MORPHOLOGY IS ESSENTIAL</u>

Major Morphological Characters Used to Identify Adult Female Mosquitoes.
(See examples of Adult Morphology on pages 25-27 or the Glossary beginning on page 149)

Scales. Differences may be expressed in shapes, sizes, colors, stature = erect or decumbent, and presence or absence on certain locations on structures.

Setae. Since these serve as sensory organs, they are variously distributed over many parts of the body. On adults they are almost always simple single setae (compare with larvae). Their differences are expressed in sizes, fixed locations, single, clusters or rows, and colors.

Color Patterns. May be due to pigmentation of the exoskeleton or color patterns in the scales, or less frequently setae. These may be expressed in stripes (lengthwise, curved, or transverse), bands (around), patches, spots, speckled, or solid colors.

Length Ratios. Typically expressed as comparisons of a character on two different structures, e.g., leg segment lengths, proboscis versus forefemur lengths, antennae versus palpi lengths.

Major Morphological Characters Used to Identify Fourth Instar Larvae.
(See examples of Larval Morphology on pages 84-85 or the Glossary beginning on page 149)

Setae. These normally occur in precise locations and are expressed in a multitude of shapes (blunt, pointed, palmate, and many different types of branching), sizes (stout, thin, long, short), and are located on nearly every structure on the larvae except the anal papillae.

Pecten. Occur, when present, as different shaped stout or thin spines in a basal row on the venter of the siphon, and often possess small basal denticles on the posterior border.

Anal Papillae. Almost always expressed as two pairs of pale, membranous, short, long, blunt, attenuated, or sharp pointed structures located on segment X. Occasionally they are swollen and sausage-like or with visible internal tracheae.

Siphon. Shape highly variable. These are expressed as thick, inflated, very thin, long, short, tubular (width equal along length), attenuated, curved, with or without subapical spines, straight, clear, pigmented, or banded.

Spiracular Apparatus. Only occurs on *Anopheles*. Differences are expressed as pigmentation, lengths of setae, and number, length, and arrangements of pecten spines on the pecten plate.

Note, there are no true scales on larvae, but there can be flattened pointed structures in the comb that are typically called "comb scales."

V. USING A DICHOTOMOUS KEY

This book contains dichotomous keys with illustrations between the couplets that are used to identify the adult female or 4th instar larvae of mosquitoes. The dichotomous keys in this guide are a series of paired statements (i.e., "couplets") that allow the reader to accurately identify an unknown mosquito at genus and species levels. Both halves of a couplet must be read to determine which choice(s) may be correct. Using a key, the reader will examine the unknown specimen using a series of descriptive choices at each couplet. After selecting the correct choice, the reader is directed to another couplet and will continue this process until they arrive at a terminal couplet that will provide the correct identity (genus or species) for the mosquito. In this guide, we have attempted to avoid single character couplets, thus two or more characters have been found for most couplets that, in many cases, will assist in identifying rubbed or otherwise damaged specimens. The couplets containing multiple characters are presented in a manner where the most valid characters have a ranked priority. In other words, the first character presented in a couplet-half will be more valid than later characters in that couplet-half.

VI. DISTINGUISHING FEMALE FROM MALE MOSQUITOES

Before using the generic key to the adult females (page 28) the sex of the adults must be determined. The following table provides two useful characteristics that, in the absence of gynandromorphic specimens, will always distinguish the two sexes.

Sex	Distinguishing Characteristics
Females	Tip of abdomen rounded or pointed, without obvious external sexual structures, except short or long cerci; Antennae with sparse short whorl setae
Males	Tip of abdomen ends in the male external genitalia, including clasping structures used during mating; Antennae almost always with many long whorl setae which provide a bushy appearance (except for *Wy. smithii*).

Although commonly used to separate the females of certain genera, the differences in palpi lengths are not useful for distinguishing males and females of all mosquito species. Males of at least four species in the MAMCA region have short palpi identical to those on the respective females. Because of this ambiguity we use the two above characters to accurately separate the sexes.

ADULT MORPHOLOGY

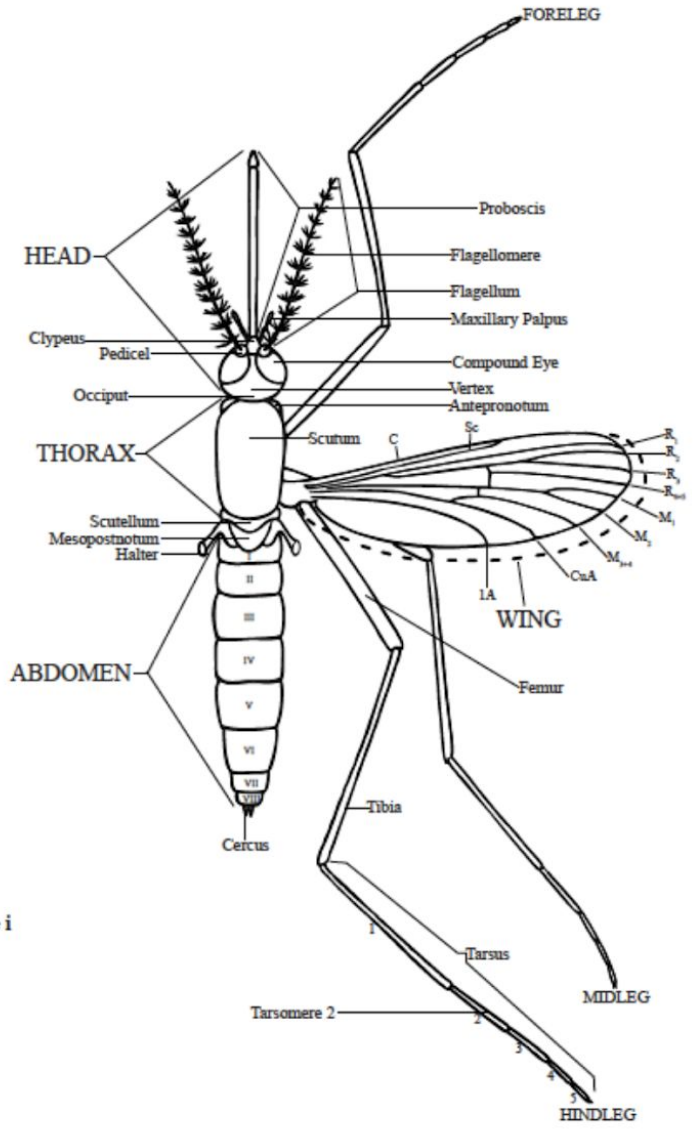


Figure i

Wing - Dorsal View

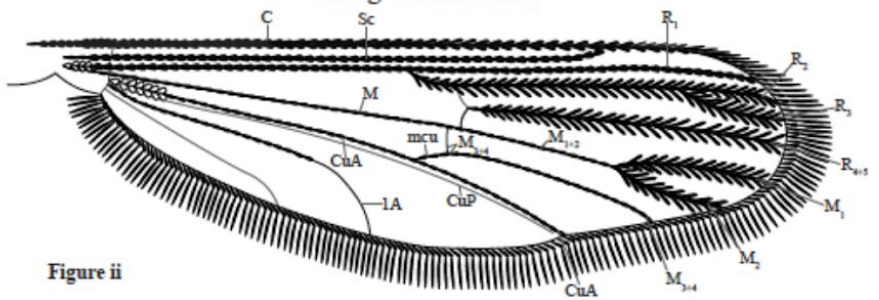
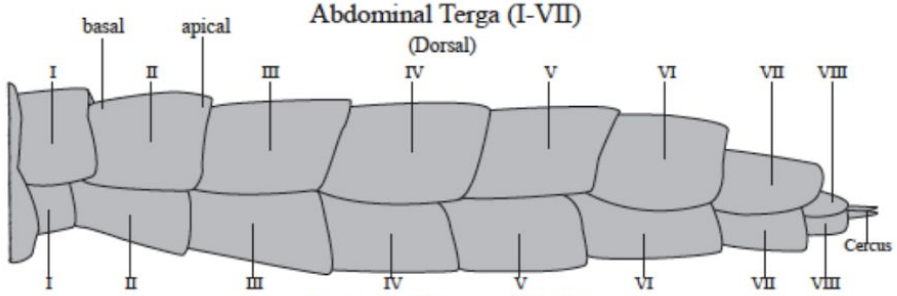


Figure ii

1A	- anal vein	M_2	- media two	R_{4+5}	- radius four plus five
C	- costa	M_{3+4}	- media three plus four	Sc	- Subcosta
CuA	- cubitus anterior	mcu	- mediocubital crossvein		
CuP	- cubitus posterior	R_1	- radius one		
M	- media	R_2	- radius two		
M_1	- media one	R_{2+3}	- radius two plus three		
M_{1+2}	- median one plus two	R_3	- radius three		

Abdominal Terga (I-VII)

(Dorsal)



Abdominal Sterna (I-VIII)

(Ventral)

Figure iii

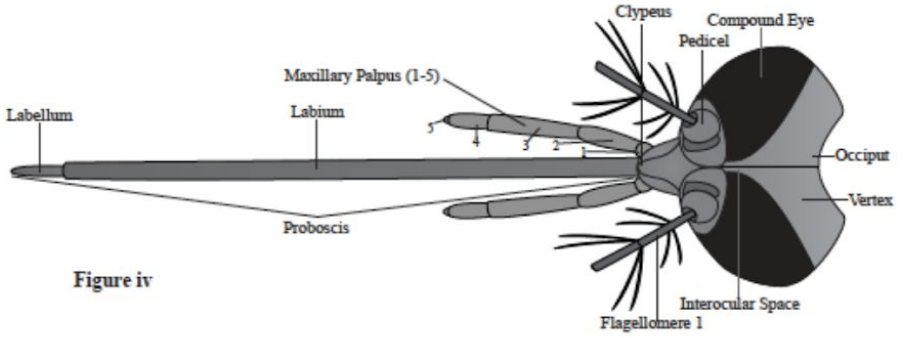


Figure iv

WHO IS THAT?

Identifying...

IS THAT?

ADULT MORPHOLOGY

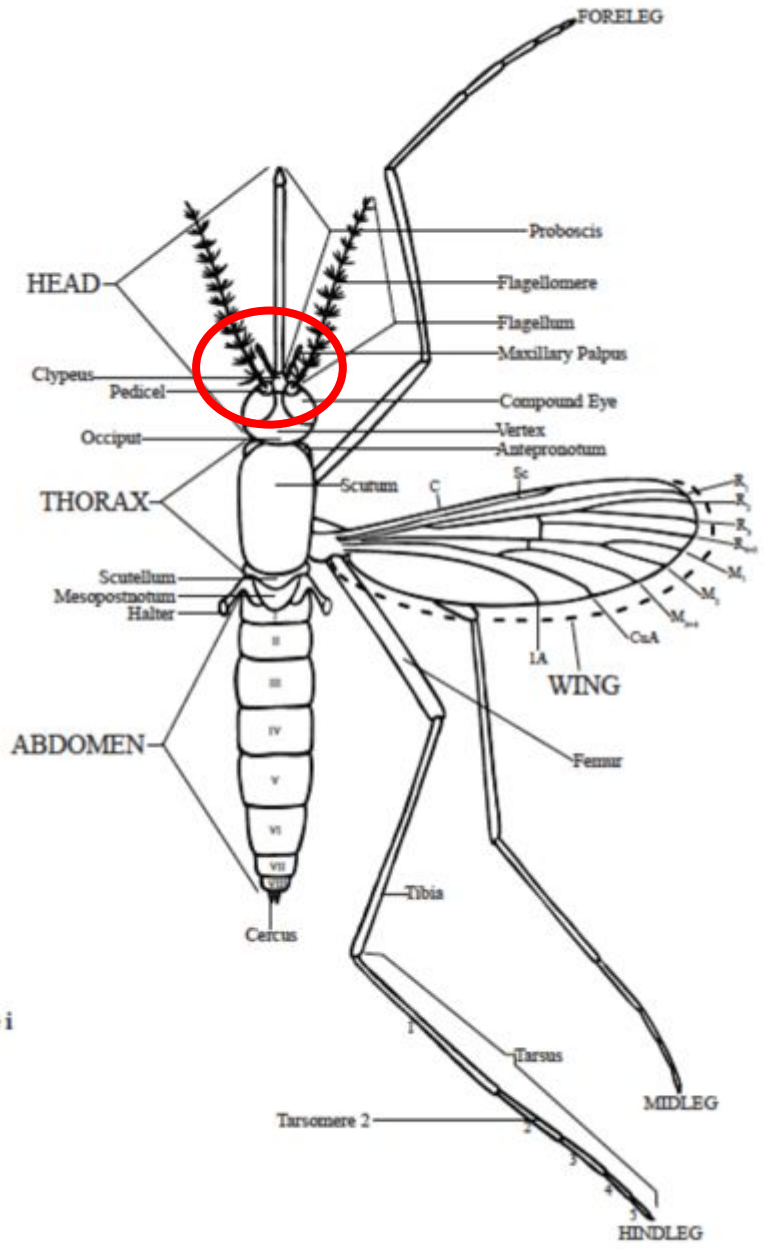


Figure i

Key to the Female Genera

Palpus longer than antennae (Fig. 1); scutellum evenly rounded, with continuous row of posterior setae (Fig. 2). 2

Palpus much shorter than antennae (Fig. 3); scutellum with 3 distinct lobes, long setae confined to the 3 lobes (Fig. 4). 3

Fig. 1

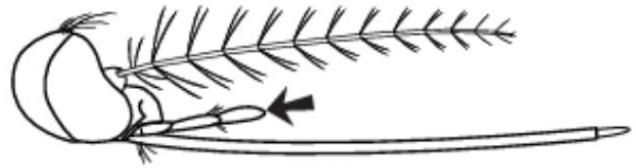


Fig. 3

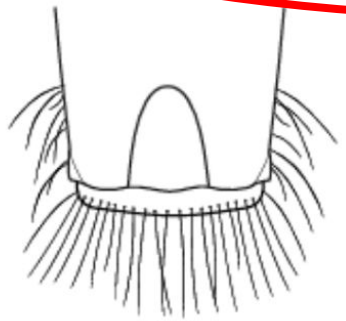


Fig. 2

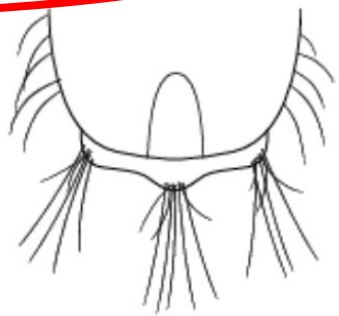


Fig. 4

WHO IS THAT?

Key to the Female Genera

1. Palpus longer than antennae (Fig. 1); scutellum evenly rounded, with continuous row of posterior setae (Fig. 2). 2

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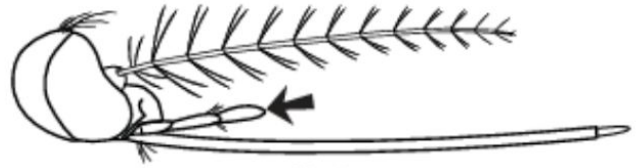


Fig. 3

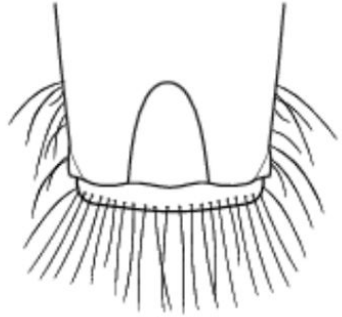


Fig. 2

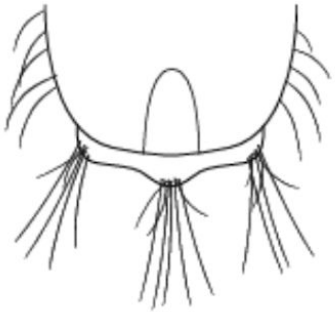


Fig. 4

WHO IS THAT?

2(1). Proboscis strongly bent downward, much thicker at base than at apex (Fig. 5); palpus approximately 0.5-0.6 length of proboscis (Fig. 5). . . . . ***Toxorhynchites rutilus rutilus***
Toxorhynchites rutilus septentrionalis
(See Note 1)

Proboscis nearly straight, approximately as wide at apex as at base (Fig. 6); palpus approximately equal to length of proboscis (Fig. 6). . . . . ***Anopheles*** **(p. 55)**

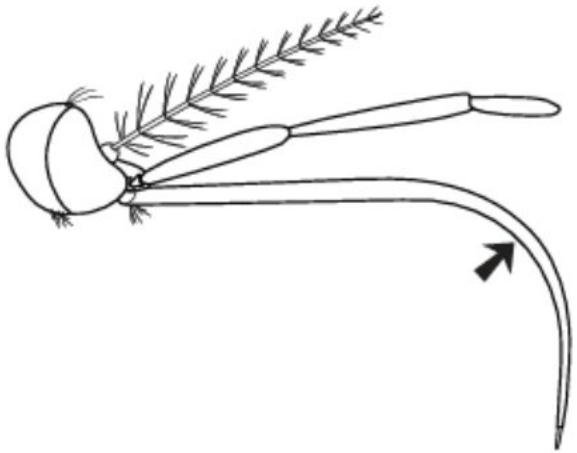
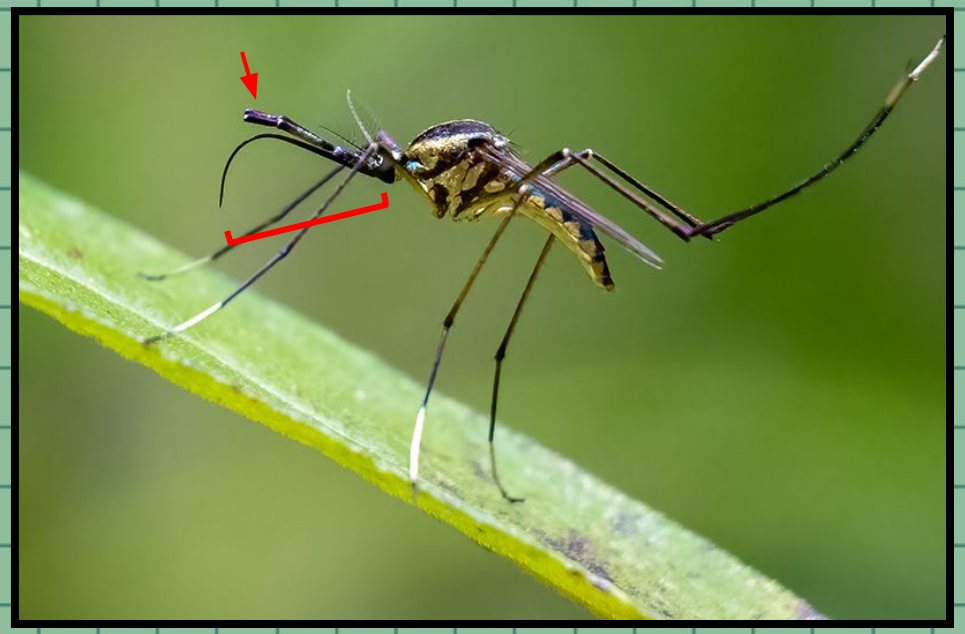


Fig. 5

Fig. 6

WHO IS THAT?



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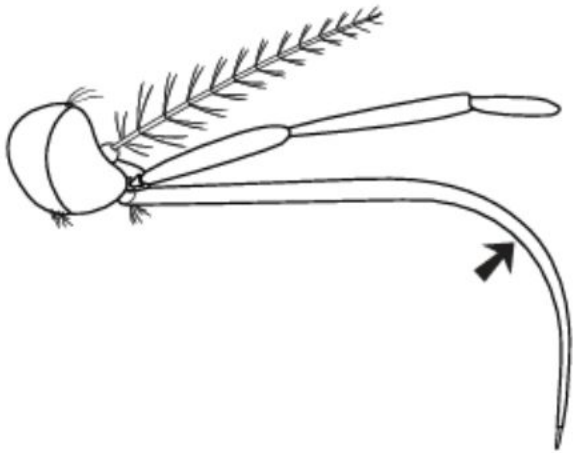


Fig. 5

Fig. 6

WHO IS THAT?

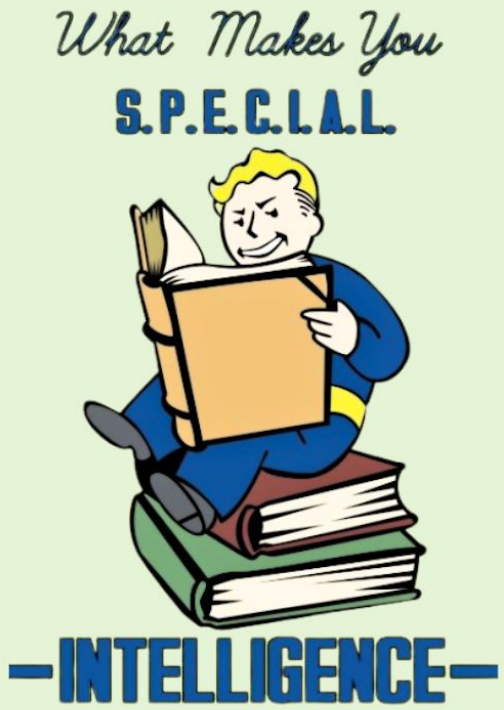
Toxorhynchites rutilus

PRO TIPS

- READ THE COUPLET CAREFULLY, EVERY DETAIL MATTERS!
- IF YOU GET STUCK, GO BACK AND TRY AGAIN. IF YOU HAVE MULTIPLE SPECIMENS YOU THINK ARE THE SAME, RUN EACH ONE THROUGH THE KEY AND SEE IF YOU GET THE SAME RESULT
- IF YOU ARE UNSURE OF ANATOMICAL TERMINOLOGY, STOP, GO LEARN MORE ABOUT IT, AND RESUME ID

GOOD LUCK!

+1 Intelligence



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