

Identification Guide to the Common Mosquito Species in Arizona

Compiled by Frank Ramberg
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Whole Body (habitus) – *Aedes aegypti* Female

The insect body is divided into three basic sections:

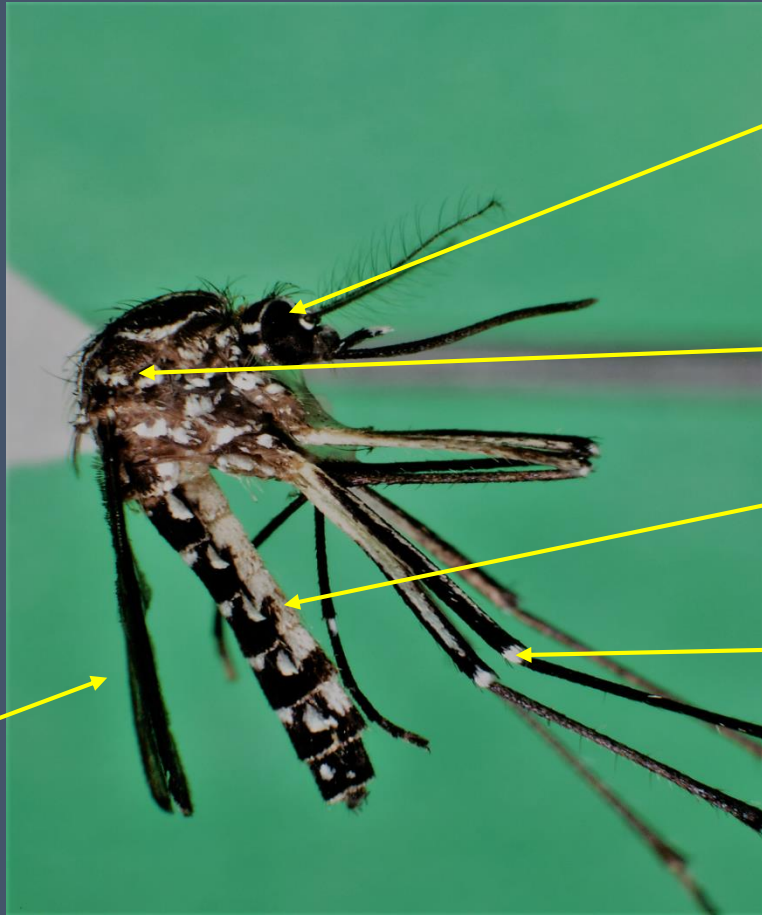
1. **head** – includes eyes, proboscis, palps & antennae

2. **thorax** – three pairs of legs & two wings attached

3. **abdomen**

4. **legs**

wings



mosquito or not?



Crane fly



proboscis, *Aedes aegypti*



Culex erraticus – stylets free of sheath

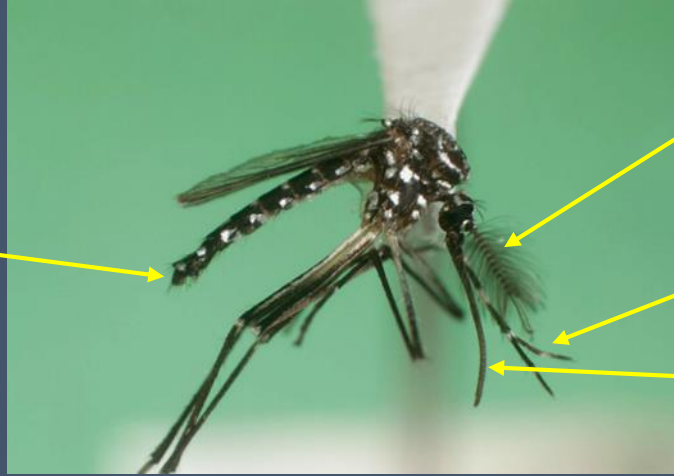


elongated snout on crane fly head

A mosquito always has a long, slender proboscis. Other flies, like the crane fly at left may have an elongated face, but it will not be as long or slender as the mosquito proboscis. On crane flies or midges, the mouthparts are at the tip of the snout. The proboscis of the mosquito consists of an outer sheath, as above, with the slender threadlike piercing mouthparts inside it.

Male or Female mosquito?

Male genitalia

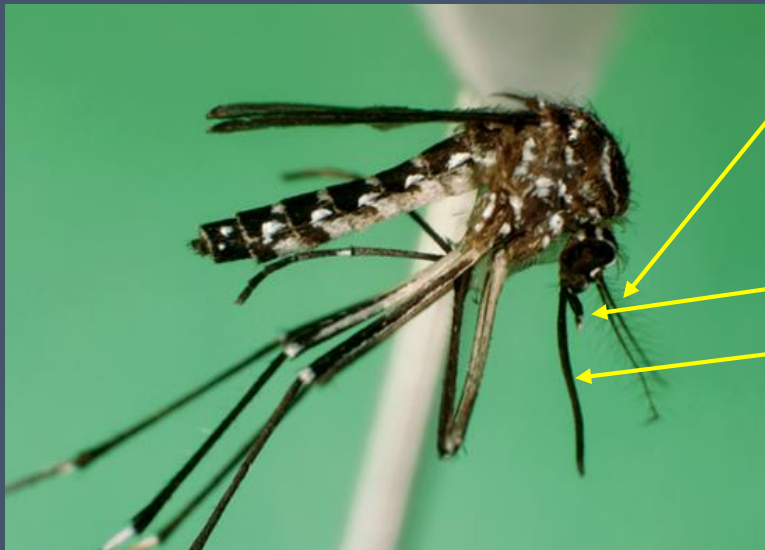


The antennae of the male are feather-like, with long bristles or hairs

The palps of the male are almost as long as the proboscis...

palps

proboscis



The antennae of the female are more thread-like, with short bristles or hairs.

The palps of the female aedine and culicine mosquitoes are much shorter than the proboscis.

palps

proboscis

(*Aedes aegypti*)

Palps on female *Anopheles* and *Aedes*



Anopheles hermsi female proboscis palps



Aedes aegypti female proboscis palps

Aedes identification characters



The *Aedes* female has a narrowly pointed or tipped abdomen. (This is also true of *Psorophora*.)



The *Culex* female's abdomen tip is more broadly rounded.

mesothoracic spiracle



Aedes adults have postspiracular setae.

Aedes aegypti (Linnaeus)

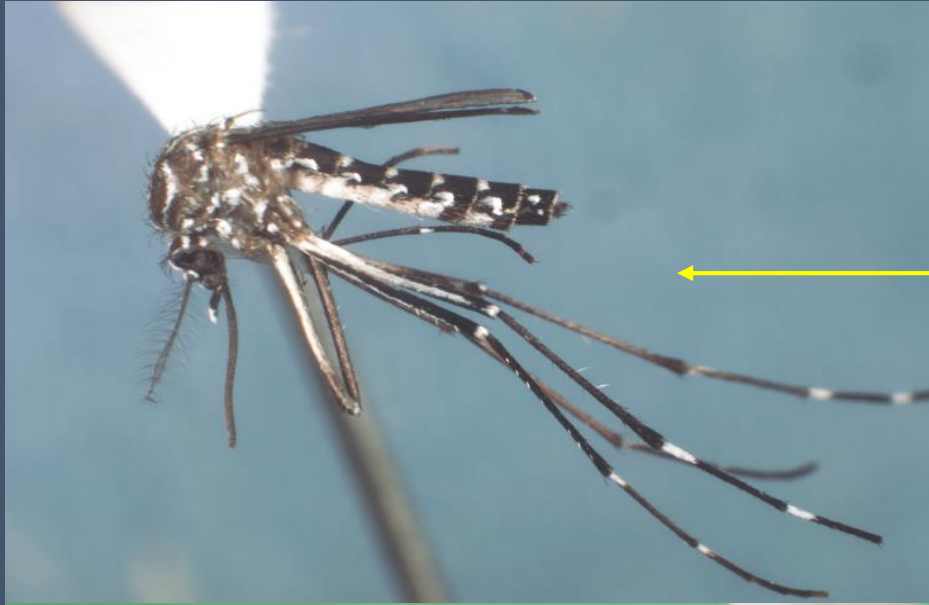
Aedes aegypti, the yellow fever mosquito, is now common in southeastern Arizona. It is closely associated with and feeds primarily on humans. It is a small container breeder and will be collected around and in homes. It is active primarily during dusk and dawn. It is often noticed flying about ankles looking for an opportunity to feed. It is not usually thought to come very readily to CO₂ traps, and newer sentinel traps are better for collecting adults.

Ae. aegypti is the main vector for dengue virus, Chikungunya virus, and Zika virus, which are potentially capable of transmission in southeastern Arizona.

Below are images that illustrate the adult characters for the species. Also, *Aedes albopictus*, a related, similar species that vectors both viruses but hasn't become established in Arizona, is illustrated.



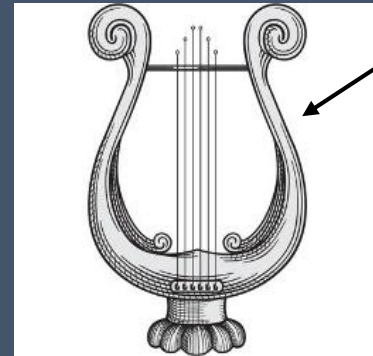
(Aedes aegypti)



Aedes aegypti female



lyre-shaped scutal pattern



lyre

Aedes albopictus Skuse



Aedes albopictus, the Asian tiger mosquito, is an introduced species in the USA. It is closely related to and closely resembles *Aedes aegypti*. It is an aggressive human biter, and it is also a vector of dengue virus and Chikungunya virus, both of which could be transmitted in Arizona. *Ae. albopictus* is not established in Arizona, but it has been introduced at least two times on plants ordered online from out of state. In Tucson the mosquitoes didn't become airborne. This specimen is a male reared from that sample. The eggs can come attached to roots and stems. As with *aegypti*, the eggs are laid just above the water on wet surfaces, and they dry out as the water does. They hatch when rewetted. Both species are container breeders, and both are closely associated with humans.

The two species are quite similar, and the next slide shows the easiest character for distinguishing the adults...

(*Aedes aegypti* & *Aedes albopictus*)



The scutum of *Aedes albopictus* has only one line of scales running back along the scutum, with white scale spots along the sides, just visible at the edges of the thorax.



The scutum of *Aedes aegypti* has a lyre-shaped pattern, with two lines down the center of the thorax.

(*Aedes aegypti* & *Aedes albopictus*)

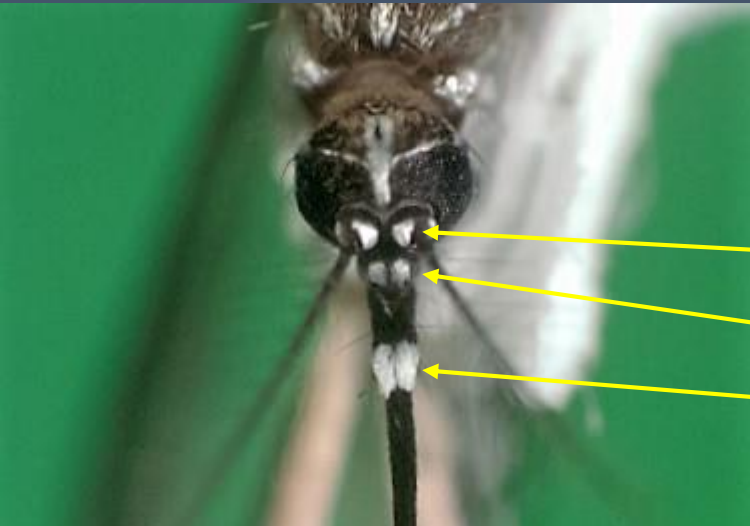


The abdominal sternites of *Aedes albopictus* have white basal scale bands, but the rest of the segment is dark –scaled.



The abdominal sternites of *Aedes aegypti* are solidly white-scaled.

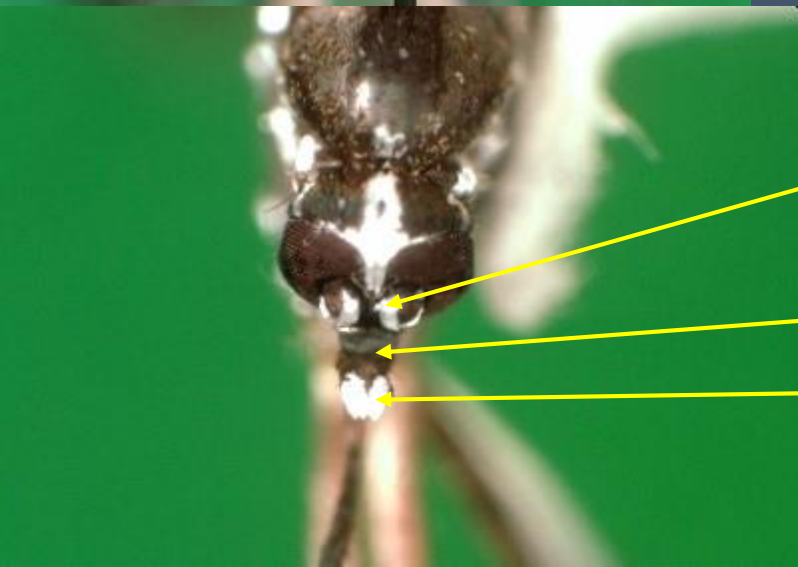
Aedes aegypti & *Aedes albopictus*



This slide and the next slide show characters of these two species that often survive heavy damage or rubbing that occurs in crowded trap samples:

Aedes aegypti – The clypeus of the female has two white scale spots.

- antennal bases
- clypeus with scale spots
- palp tips

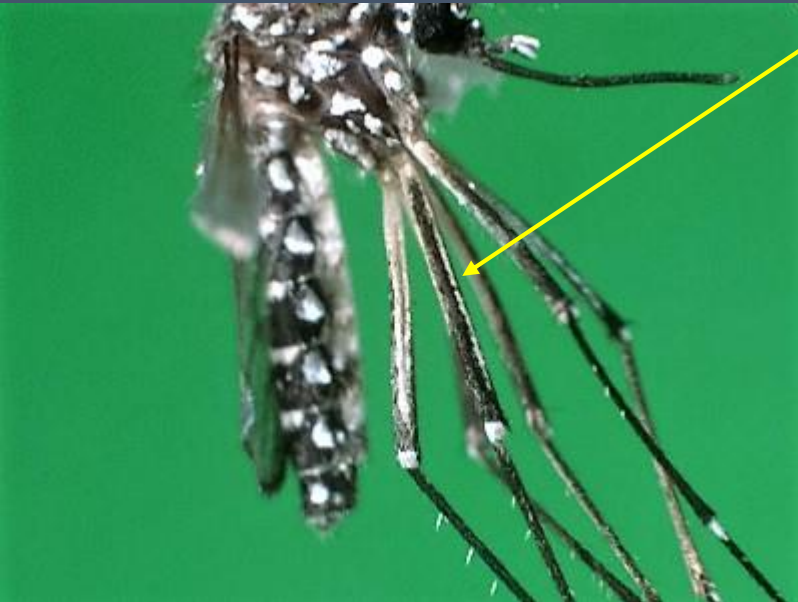


Aedes albopictus – no scales on the clypeus (antennae are missing on specimen)

- antennal bases
- clypeus – no scales
- palp tips

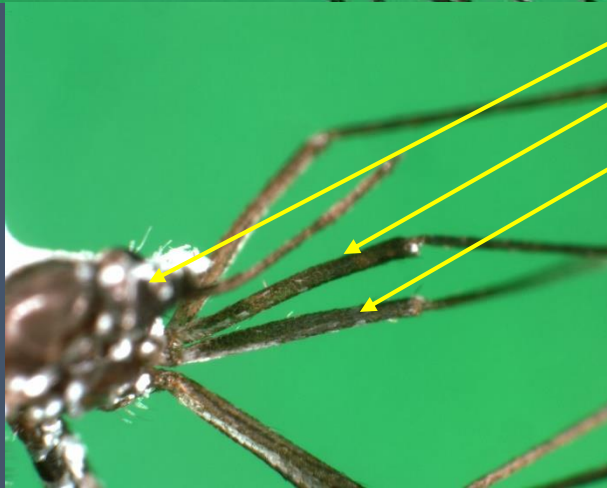
and, on the next slide...

Aedes aegypti & *Aedes albopictus*



The midfemur of the adult *Aedes aegypti* has a dorsal strip of white scale spots.

For this character, be careful to get the leg oriented to view the dorsal surface.



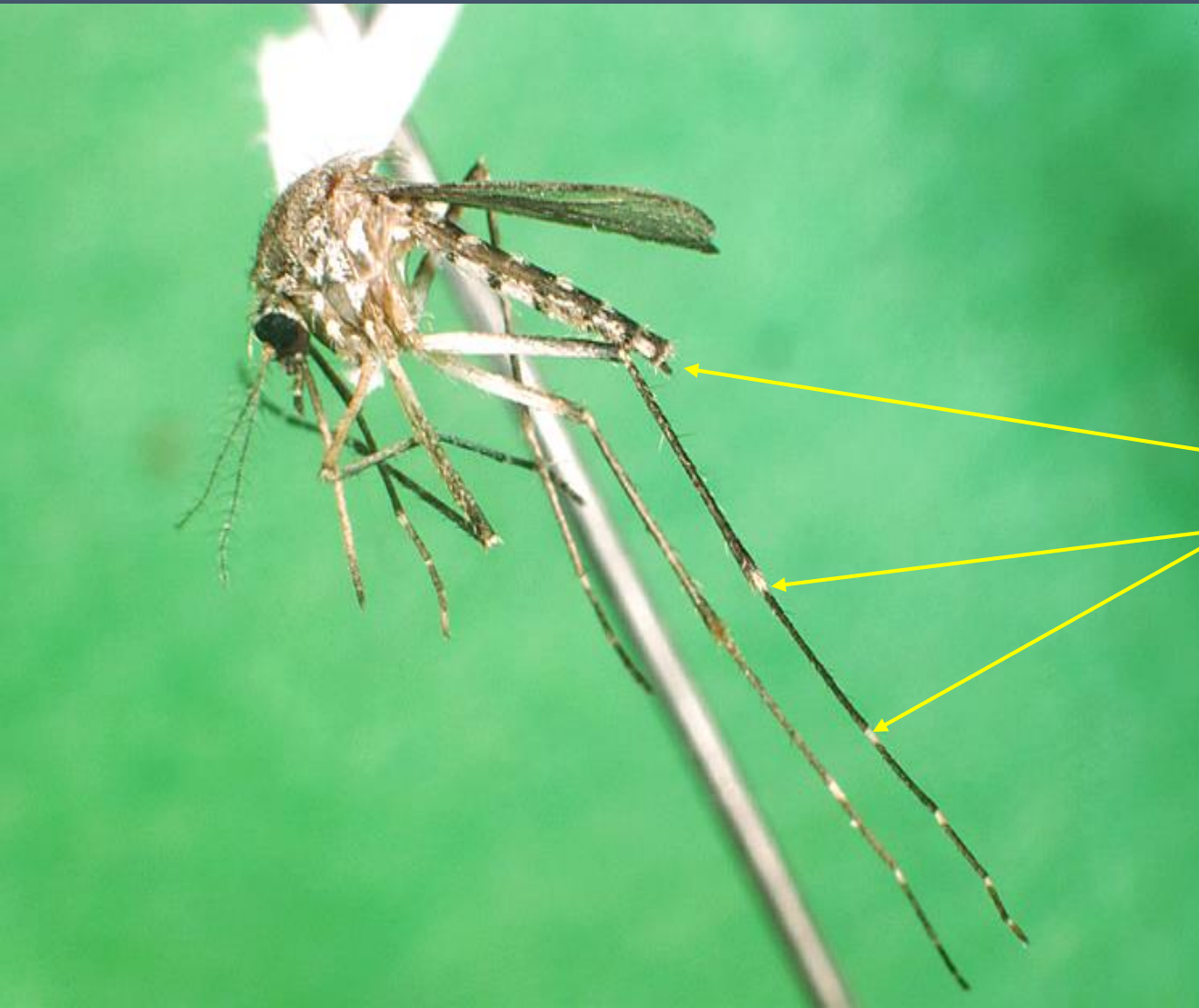
Head of *Aedes albopictus* female

foreleg

The midfemur of *Aedes albopictus* lacks the dorsal line of scale spots.

For further detail, see Savage, H. M. & G. C. Smith. 1994. Identification of damaged adult female specimens of *Aedes albopictus* and *Aedes aegypti* in the new world. *Journal of the American Mosquito Control Association* 10 (3): 440-442.

Aedes vexans (Meigen)



Aedes vexans is a common cosmopolitan species that is most often found in rural habitats and wetlands along with common wetland species.

It is an aggressive human biter, but it is not usually associated with disease transmission.

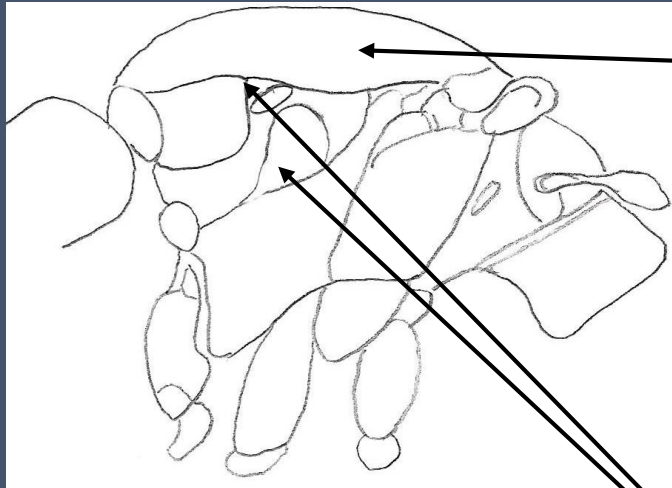
Note the narrowed abdominal tip and the narrow white scale bands on the legs. The proboscis is unbanded, and the palp tips are white-scaled.

Culex quinquefasciatus



proboscis dark, unbanded
legs unbanded

Culex quinquefasciatus



scutum (dorsal area) of thorax mostly brown, no obvious color pattern



no pre- or postspiracular setae

Culex quinquefasciatus



abdominal tergites with light scaled, slightly convex basal bands

Culex tarsalis Coquillett, 1904



Culex tarsalis is one of the most common species in wetland and similar riparian habitats. As with *quinquefasciatus*, it feeds on birds, mammals, and humans. It is active at night, primarily. It also is a vector of WNV and StL. encephalitis.

The white-banded proboscis and leg bands that span tarsal segment breaks, as seen on this image, are good id characters. Note, though that there are three *Culex* species that resemble *tarsalis* (*stigmatosoma*, *thriambus*, *coronator*), See following slides for characters...

(*Culex tarsalis*)



The proboscis of *Culex tarsalis* has a conspicuous white scale band that completely circles the proboscis. The palps are white-tipped.

Two of the other *tarsalis* lookalikes, *thriambus* and *coronator*, do not have complete proboscis rings.

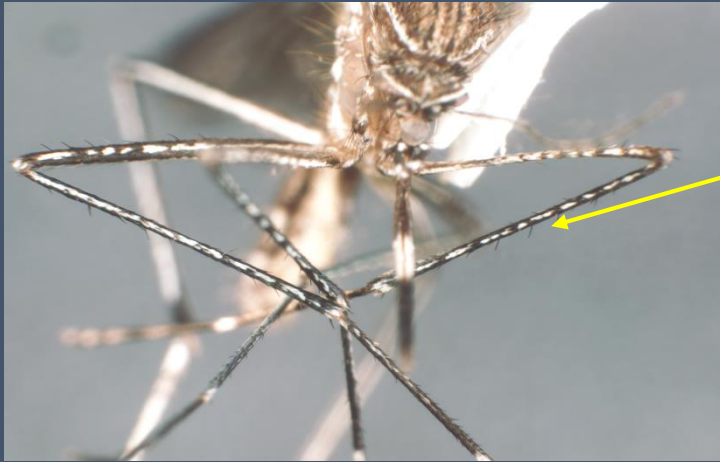
Culex stigmatosoma does have a complete ring, but it lacks the leg and body spotting noted in the next slide.

These three species may be encountered, but they aren't included here because they're harder to identify, especially in damaged specimens from CO2 traps.

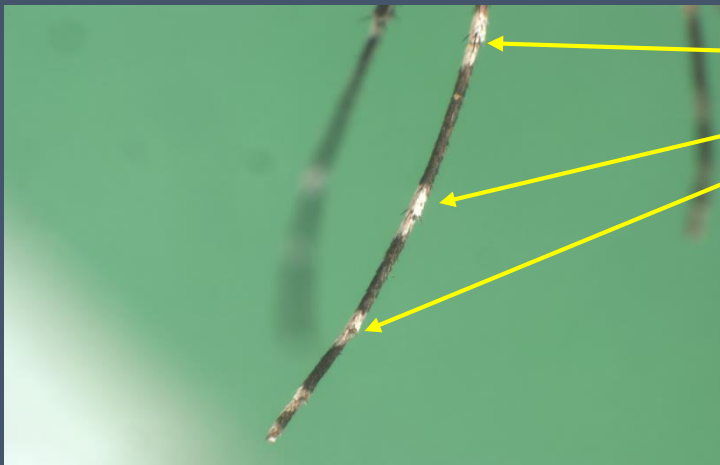
Darsie & Ward includes good drawings of the abdominal sternite scale patterns that are the best characters.

To be sure of *tarsalis* the top character on the next slide is most critical...

(*Culex tarsalis*)

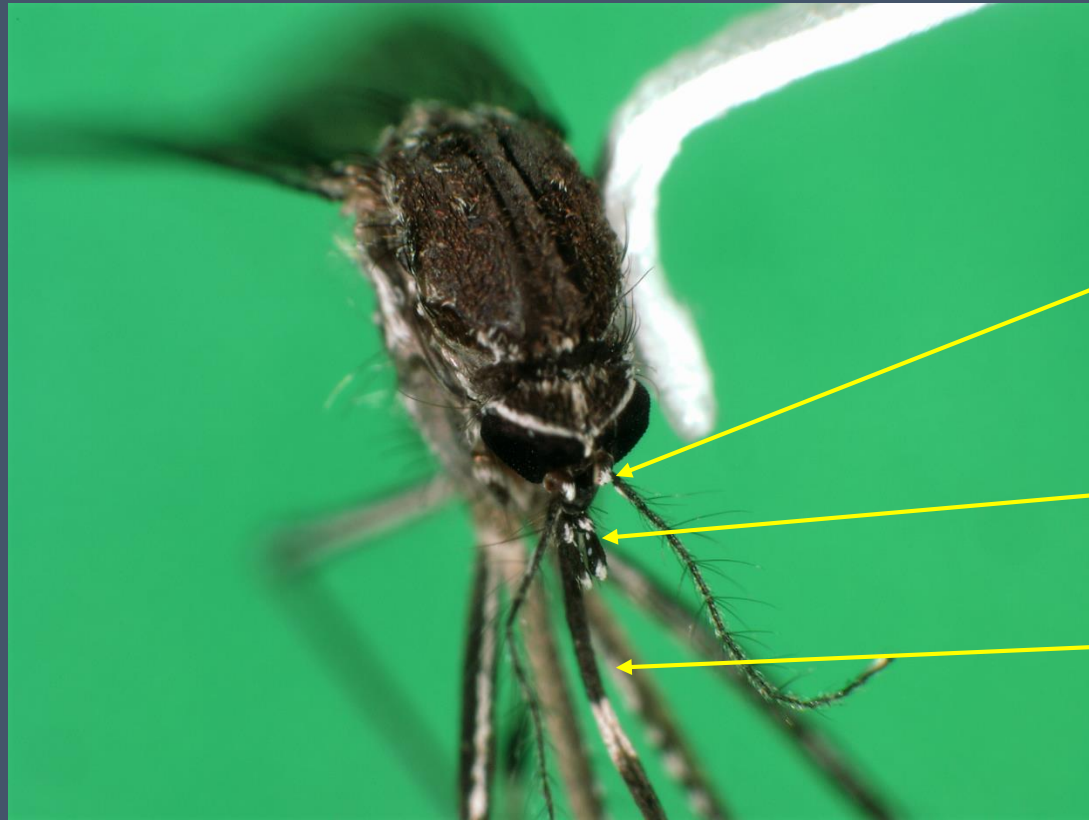


The legs of *Culex tarsalis* have lines of white scale spots that sometimes coalesce into white scale lines. The lookalike species lack these spots



This hind leg of *tarsalis* shows the white scale bands that span the tarsal segment breaks as seen in this closeup. The three lookalikes also have this character, but the tarsal rings are not usually as wide.

antennal base white scale tufts on *Culex tarsalis*



- If a specimen of *Culex tarsalis* is very badly rubbed or damaged, the white scale tufts on the antennal bases will often survive.

- antennal base tufts

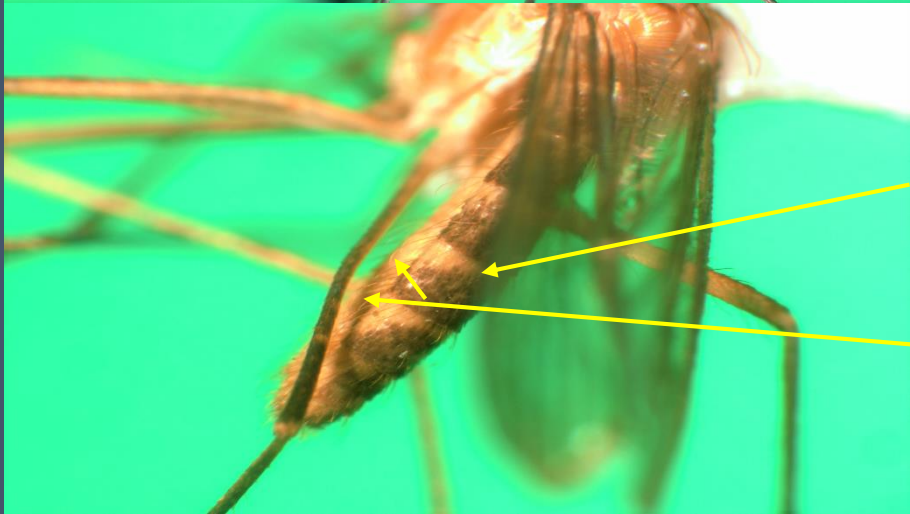
palps

proboscis

Culex erythrothorax Dyar



Culex erythrothorax is, like *Culex tarsalis*, a wetland or riparian species. In Pima County, it has been collected at Sweetwater Wetland. It has a red to rust colored look overall. There are no light leg scale bands.



The abdominal tergites are darkly scaled with narrow basal light scale bands or no basal bands at all.

The abdominal sternites are light yellow in appearance.

Culiseta inornata (Williston)

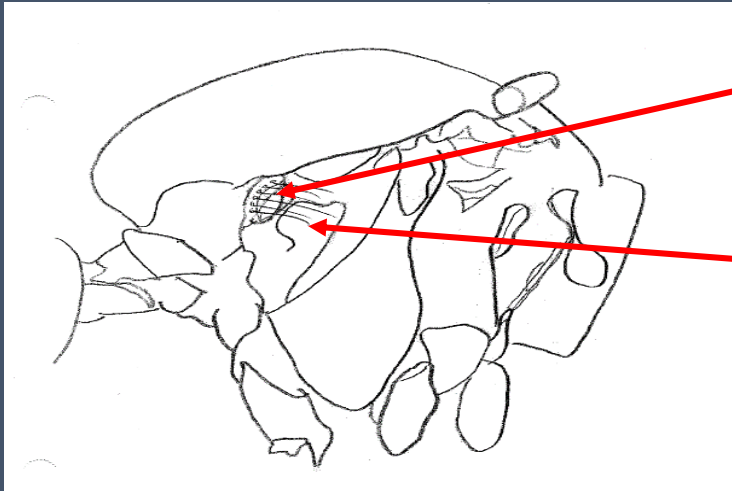


Culiseta inornata is similar to *Culex quinquefasciatus*, but it is larger and has prespiracular setae and a setal patch under the front edge of the wing near its base (next two slides). The legs are basically dark-scaled and unbanded

Culiseta inornata is found in a variety of waters, especially in wetland or riparian habitats. It is a late or early cool season species. This seasonal activity pattern seems to exclude it as a probable disease vector. The species has a wide distribution in North America.

The following slides illustrate the characters noted above

Culiseta inornata – prespiracular setae



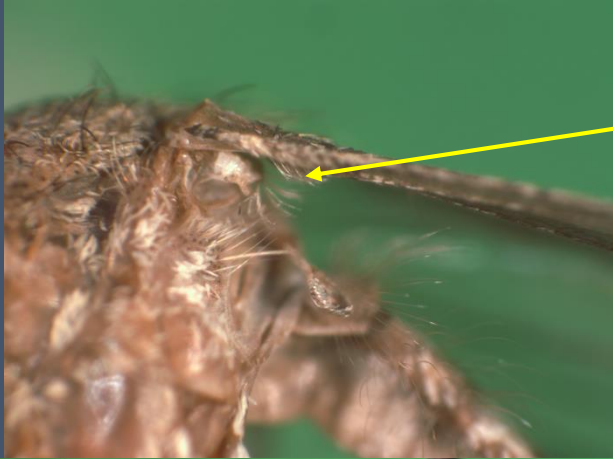
The mesothoracic spiracle is a good general thoracic landmark. The drawing shows its location and the prespiracular setae of *inornata*.

There are no postspiracular setae



The photo shows the spiracle overlaid by the prespiracular setae.

Culiseta inornata – subcostal setal patch



The top photo shows the setae patch on the underside of the front edge of the wing.



The arrow to the bottom photo shows the location of the patch on the wing.

Psorophora columbiae (Dyar & Knab) (= *toltecum*) & *Psorophora signipennis* (Coquillett)



Psorophora is one of the major genera of floodwater mosquitoes. In Pima County, large emergences of adults accompany the summer monsoon season, especially in late July and August. The top species is *Psorophora columbiae*, and the bottom species is the similar *Psorophora signipennis*. They are similar to *Aedes* (*Ochlerotatus*) species, but they have both prespiracular setae (similar to those of *Culiseta*) and postspiracular setae (similar to those of *Aedes* or *Ochlerotatus*). Note the mixture of light and dark scales that give a salt & pepper appearance to them. The leg banding and abdominal markings will be very sharp on fresh specimens. Note, also, the relatively sharply pointed abdominal tip of these females. Overall size varies considerably, but *signipennis* tends to be smaller than *columbiae*.

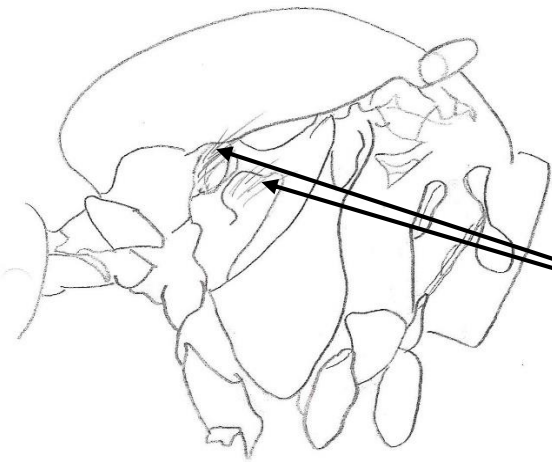
These are very common floodwater species, and they are often found together. The following slides show wing and abdominal characters.

Psorophora columbiae in the Southwest has recently been proposed to be a separate species from *Ps. columbiae* in eastern North America, and the name *toltecum* has been resurrected for it, thus making it *Psorophora toltecum* (Dyar & Knab).

above photo – *Psorophora columbiae*

lower photo – *Psorophora signipennis*

(*Psorophora columbiae*)



pre- and postspiracular
setae

prespiracular setae



postspiracular setae

Abdominal tergites of *columbiae* & *signipennis*



The tergites (dorsal segments) of the abdomen of *columbiae* have forward-pointing white-scaled triangles. These tend to rub most quickly in the center, as in this image, but the triangular shape is often still discernable.



The tergites of *signipennis* are covered with white scales with little or no patterning discernable. This abdomen is a bit rubbed.

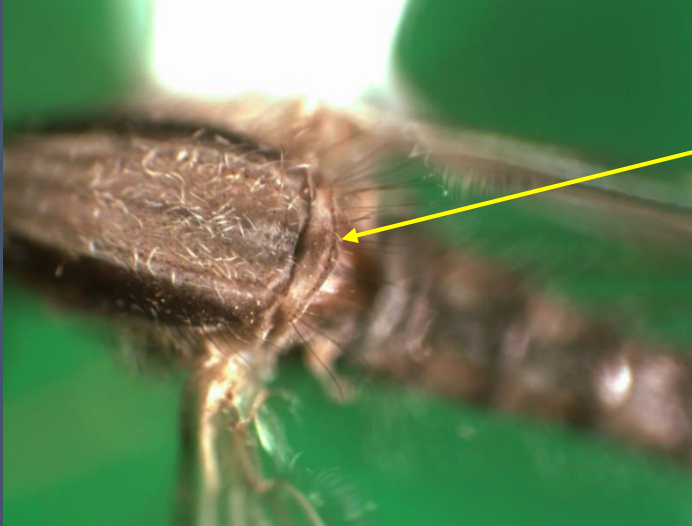
Wing scale patterns of *columbiae* & *signipennis*



The wings of these two species have both dark and light scales, but the wing of *toltecum* is mostly dark-scaled. The rear scale fringe of the wing is also dark-scaled.

The forward edge of the wing of *signipennis* has white-scaled areas, and the rear scale fringe has dark and white-scaled areas. Overall, there is more white scaling than on the wing of *columbiae*.

defining characters of *Anopheles*



The scutellum of *Anopheles* is smoothly rounded; the scutellum of the other genera has three distinct lobes.



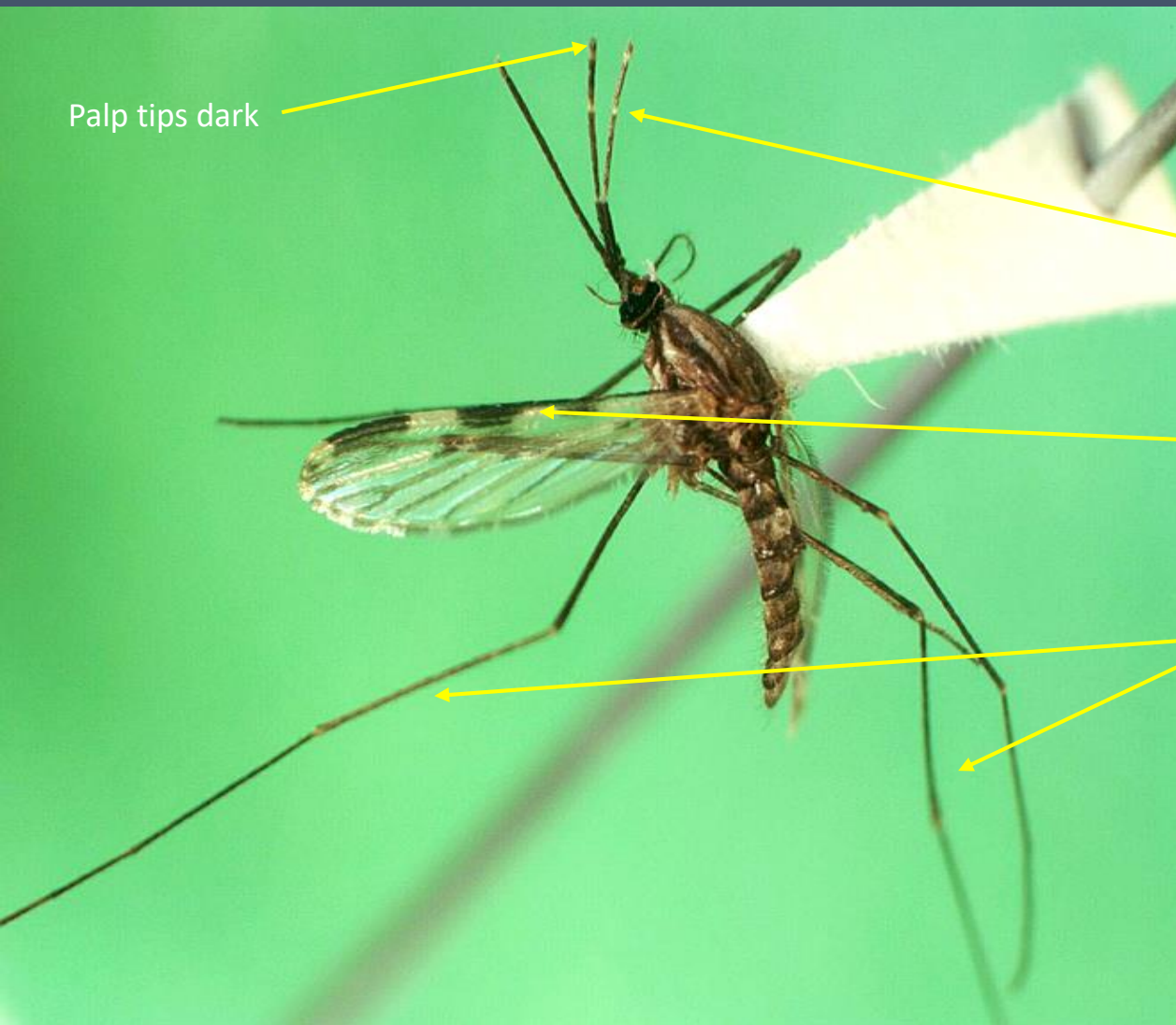
The bodies of most *Anopheles* species are not covered with scales as in the other genera. Also, the palps of the female *Anopheles* are nearly as long as the proboscis

Culex tarsalis



Anopheles franciscanus

Anopheles franciscanus McCracken



Palp tips dark

Anopheles franciscanus is the most common *Anopheles* species. It is collected mainly in wetland habitats. It is not a disease vector (*An. hermsi* is Arizona's malaria vector).

The palps of female *Anopheles* adults are almost as long as the probocis.

The wings have dark and white scale sections along the front edge.

Note the long thread-like legs.

Selected References for Identifying Arizona Mosquitoes

Bohart, R. M. & R. K. Washino. 1978. Mosquitoes of California. *University of California Division of Agricultural Science Publication 4084*. viii + 153 pp.

Carpenter, S. J. & W. J. LaCasse. 1955. *Mosquitoes of North America*. vi + 360 pp. University of California Press, Berkeley, CA.

Darsie, R. F. & R. A. Ward. 2005. *Identification and Geographical Distribution of the Mosquitoes of North America, North of Mexico*. xiv + 384 pp. University Press of Florida, Gainesville, FL.

Farajollahi, A. & D. C. Price. 2013. A rapid identification guide for larvae of the most common North American container-inhabiting *Aedes* species of medical importance. *Journal of the American Mosquito Control Association* 29 (3): 203-221.

Li, S., D. Gouge, A. Fournier, S. Nair, P. Baker & C. Olson. 2014. Mosquitoes. *Backyard & Beyond* 8 (3): 10-18. (also, *University of Arizona Cooperative Extension Bulletin az.1221.pdf*. <http://extension.arizona.edu/pubs/mosquitoes>)

McDonald, J. L., T. P. Sluss, J. D. Lang & C. C. Roan. 1973. Mosquitoes of Arizona. i + 21 pp. *Technical Bulletin 205 of the Agricultural Experiment Station, University of Arizona*.

Meyer, R. P. & S. L. Durso. 1998. Identification of the Mosquitoes of California. 80 pp. *Mosquito and Vector Control Association of California*. Sacramento, CA.



Aedes aegypti



Culex tarsalis



Culex quinquefasciatus



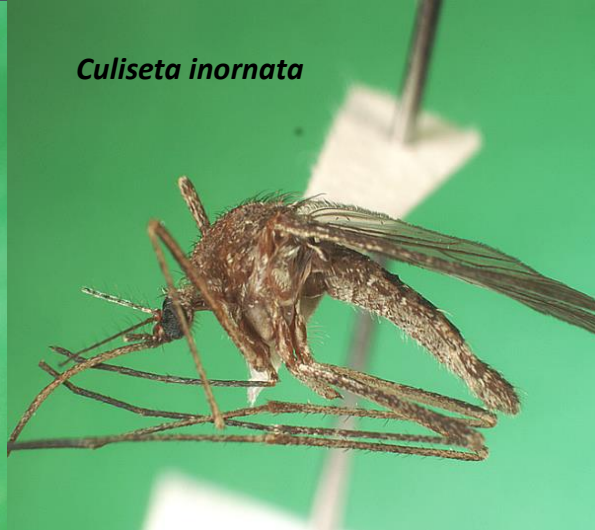
Culex erythrothorax



Aedes purpureipes



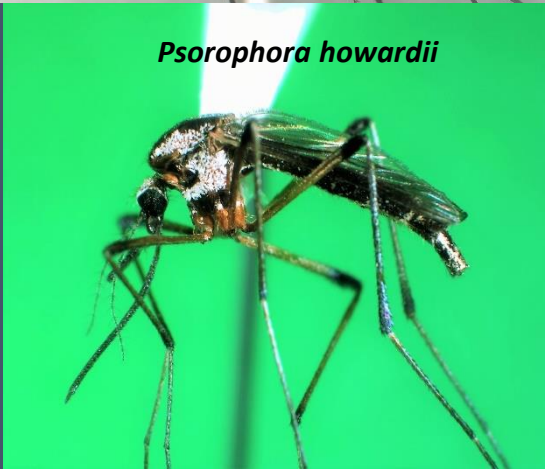
Aedes vexans



Culiseta inornata



Anopheles franciscanus



Psorophora howardii



Psorophora columbiae



Psorophora signipennis



Anopheles hermsi

Common Mosquito Species in Arizona

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University of Arizona

Not to scale