



# The Mosquitoes of Macha, Zambia

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# Preface

- When performing mosquito collections in Africa, by pyrethrum spray catch, CDC light traps, landing catches, larval collections, or aspiration, any number of mosquito species may turn up in addition to the targeted *Anopheles* malaria vectors. While information regarding the identification of anopheline species is excellent, identification of African culicines is more difficult. This pictorial reference was compiled from our voucher collection with the intention of assisting entomological research in Africa by providing an additional tool to identify common culicine species that may be of academic or public health interest. Mosquitoes included are those that have been collected during our malaria research efforts in the Macha catchment region in southern Zambia, and include collection and location data relevant to our study villages. As more information becomes available, this document will be updated. It is our hope that this reference will be a valuable resource for mosquito research in Africa. Please direct any questions or comments to Rebekah Kent at [rkent@jhsph.edu](mailto:rkent@jhsph.edu). All identifications were made using the sources listed on p. 32.

# The Mosquitoes of Macha

(Click on any entry below to view the page)

1. [\*Anopheles \(Anopheles\) coustani\* Lavarán](#)
2. [\*Anopheles \(Cellia\) arabiensis\* Patton](#)
3. [\*Anopheles \(Cellia\) quadriannulatus\* \(Theobald\)](#)
4. [\*Anopheles \(Cellia\) funestus\* s.s. Giles](#)
5. [\*Anopheles \(Cellia\) lesoni\* Evans](#)
6. [\*Anopheles \(Cellia\) parensis\* Gillies](#)
7. [\*Anopheles \(Cellia\) longipalpis\* \(Theobald\)](#)
8. [\*Anopheles \(Cellia\) rufipes\* \(Gough\)](#)
9. [\*Anopheles \(Cellia\) squamosus\* Theobald](#)
10. [\*Anopheles \(Cellia\) pretoriensis\* \(Theobald\)](#)
11. [\*Aedes \(Neomelanicolonia\) macintoshi\* Huang](#)
12. [\*Aedes \(Diceromyia\) fascipalpis\* \(Edwards\)](#)
13. [\*Aedes \(Aedimorphus\) vittatus\* \(Bigot\)](#)
14. [\*Aedes \(Aedimorphus\) ochraceus\* \(Theobald\)](#)
15. [\*Aedes \(Aedimorphus\) hirsutus\* \(Theobald\)](#)
16. [\*Aedes \(Aedimorphus\) dalzieli\* \(Theobald\)](#)
17. [\*Aedes \(Aedimorphus\) argenteopunctatus\* \(Theobald\)](#)
18. [\*Aedes \(Stegomyia\) aegypti\* \(Linnaeus\)](#)
19. [\*Aedes \(Stegomyia\) spp., dendrophilus\* group](#)
20. [\*Aedes \(Mucidus\) sudanensis\* \(Theobald\)](#)
21. [\*Culex \(Culex\) quinquefasciatus\* Say](#)
22. [\*Culex \(Culex\) univittatus\* Theobald](#)
23. [\*Culex \(Culex\) antennatus\* \(Becker\)](#)
24. [\*Culex \(Culex\) poicilipes\* \(Theobald\)](#)
25. [\*Culex \(Oculeomyia\) bitaenorrhynchus\* Edwards](#)
26. [\*Culex \(Culiciomyia\) nebulosus\* Theobald](#)
27. [\*Culex \(Lutzia\) tigripes\* De Grandpré & De Charmoy](#)
28. [\*Uranotaenia \(Uranotaenia\) balfouri\* Theobald](#)
29. [\*Mansonia \(Mansonioides\) uniformis\* \(Theobald\)](#)
30. [\*Toxorhynchites \(Toxorhynchites\) brevipalpis\* Theobald](#)
31. [\*Ficalbia circumtestacea\* \(Theobald\)](#)

# *Anopheles (Anopheles)* *coustani* Lavarán

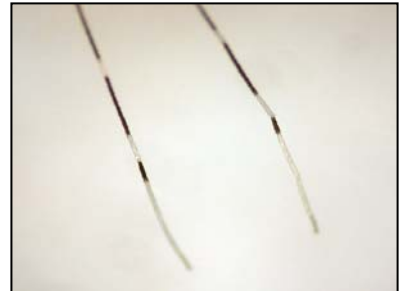


Shaggy maxillary palps

## Collection notes:

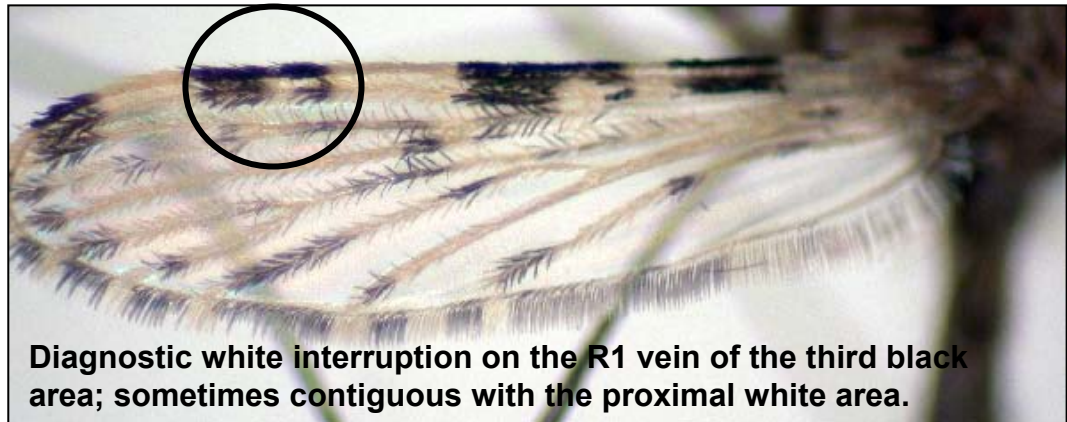
Ubiquitously collected from most breeding sites throughout the Macha catchment region; adults occasionally in indoor and outdoor CDC light traps

5<sup>th</sup>, 4<sup>th</sup>, and most of 3<sup>rd</sup> hind tarsal segments white



# *Anopheles (Cellia) arabiensis* Patton

**\*\*Morphologically identical to *An. quadriannulatus* (Theobald), also occurring in Macha\*\***



**Collection notes:** Adults collected resting inside sleeping houses. Larvae in sunlit, usually temporary puddles of water, sometimes together with *An. quadriannulatus*. *An. arabiensis* is a demonstrated vector of *P. falciparum* in Macha. *An. quadriannulatus* feeds on cattle and is of no known public health importance. *An. quad.* collected from Chidakwa and Lupata breeding sites.



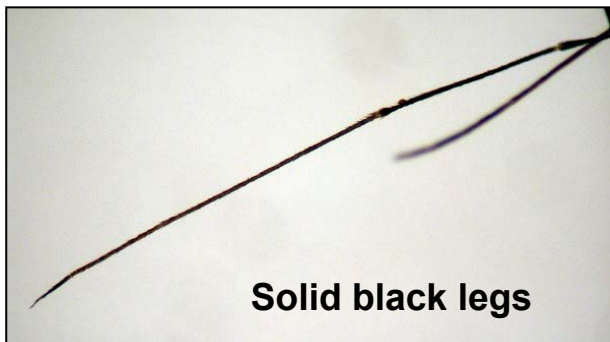
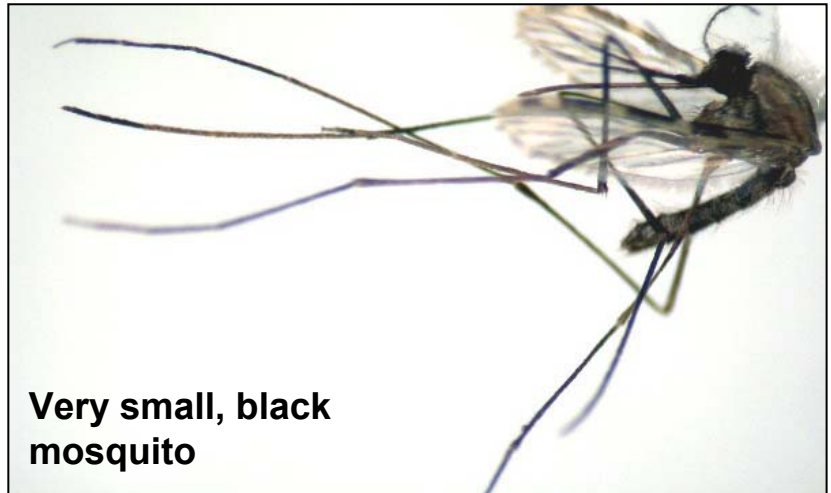
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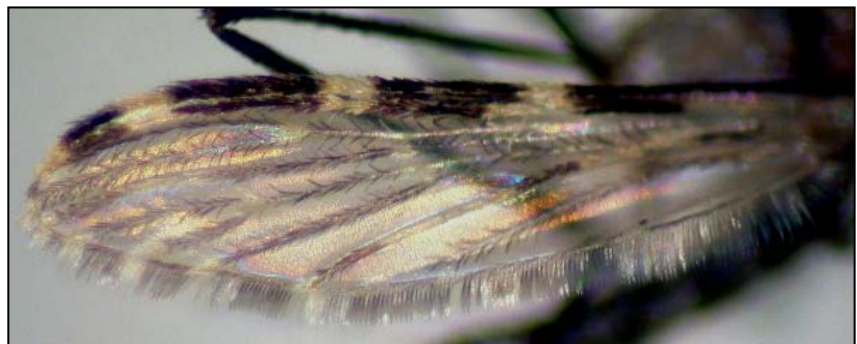
# *Anopheles (Cellia) funestus* s.s. Giles

**\*\*Morphologically identical to *An. lesoni* Evans and *An. parensis* Gillies, also occurring in Macha\*\***



## **Collection notes:**

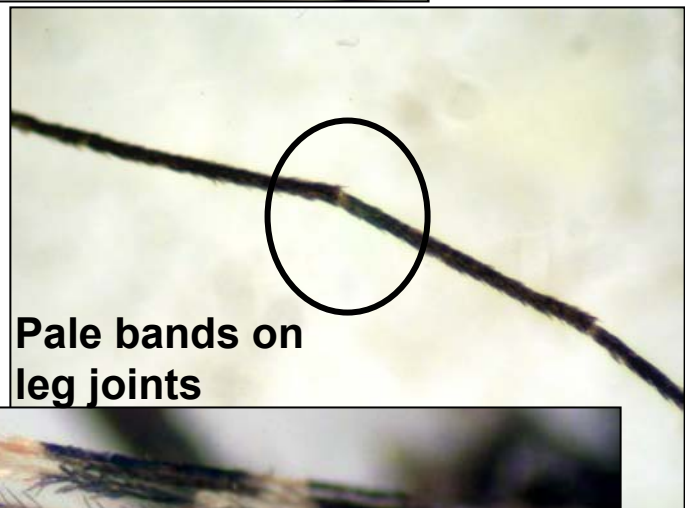
Adults of all three species collected resting inside sleeping houses. *An. funestus* and *An. lesoni* also in indoor CDC light traps. *An. lesoni* and *An. parensis* blood meals were from cattle; these species are of no known public health importance.



# *Anopheles (Cellia) longipalpis* (Theobald)



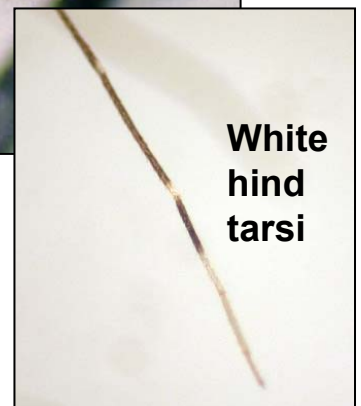
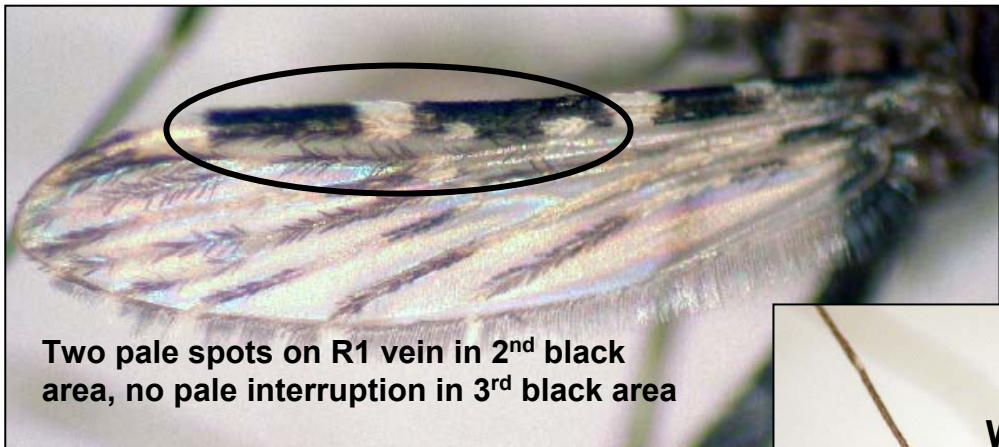
**Collection notes:** Collected resting inside sleeping houses, however blood meals were from cattle, dogs, and goats. Commonly collected inside houses in Mufwafwi village.



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# *Anopheles (Cellia) rufipes* (Gough)



**Collection notes:** Ubiquitously collected in breeding sites throughout Macha and in CDC light traps, especially traps placed near cattle kraals. Occasionally found resting inside sleeping houses, but not a known malaria vector.

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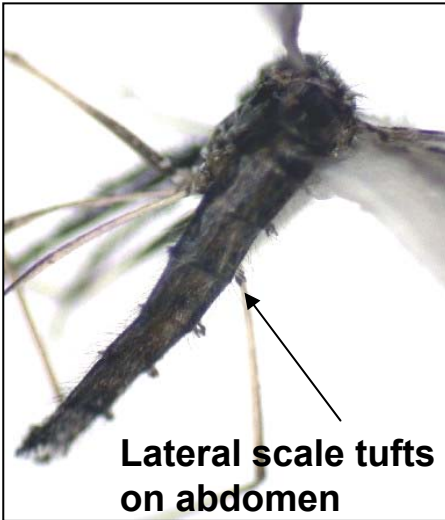


# *Anopheles (Cellia) squamosus* Theobald

Shaggy  
palps



Lateral scale tufts  
on abdomen

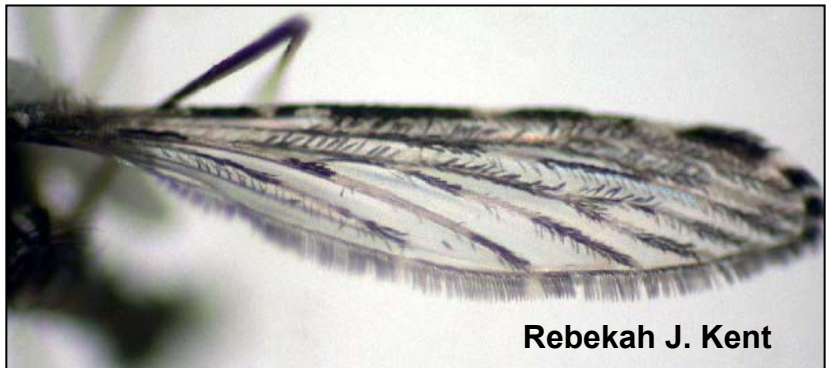


Speckled femora and tibia,  
banded tarsi



## Collection notes:

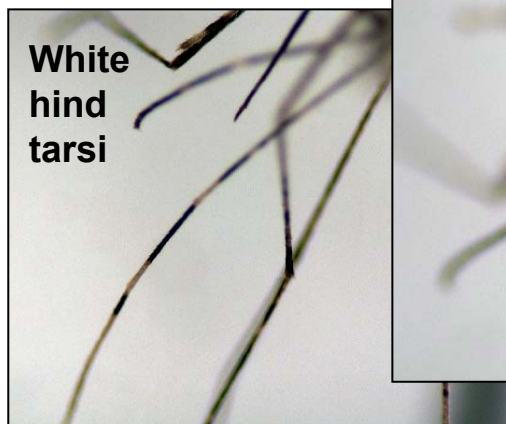
Ubiquitously collected in breeding sites throughout Macha. Adults also collected with indoor and outdoor CDC light traps.



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# *Anopheles (Cellia) pretoriensis* (Theobald)



**Collection notes:**  
Collected in CDC light traps hung near cattle kraals, April 2005.



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# *Aedes (Neomelanicion) macintoshi* Huang



Subspiracular scales  
yellow and narrow



Lateral bands  
on scutum  
bright yellow



Collection notes:  
Collected by  
human landing  
catch, Lupata  
village, January  
2006

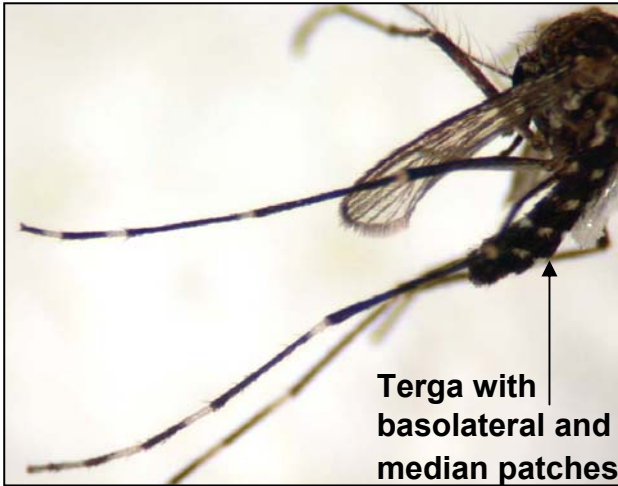


Pale scales on Rs,  
 $R_{2+3}$ , M,  $M_{1+2}$

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# *Aedes (Diceromyia) fascipalpis* (Edwards)



Tarsomeres 1-4 of all legs, and hindtarsomere 5 with broad, white, basal band

Collection notes: one adult female collected during human landing catches in Lupata, January 2006.



Pleuron with broad, white scales. Scutum with narrow, yellow scales.



Proboscis with slightly paler, narrow, speckled central area

Median white band on palps



Wings unspckled

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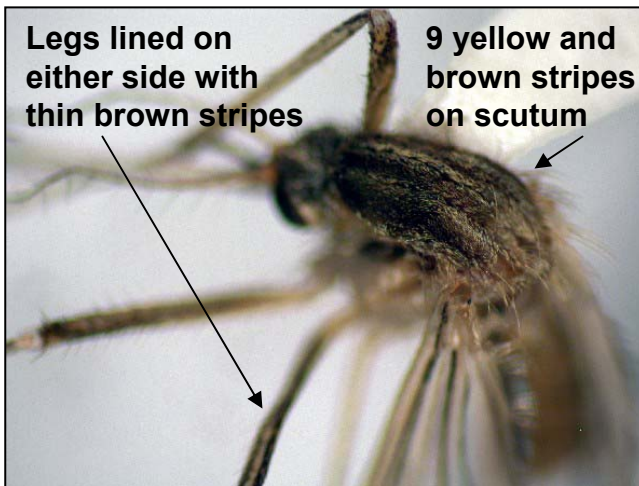
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# *Aedes (Aedimorphus) ochraceus* (Theobald)



Large yellow and brown mosquito



Legs lined on either side with thin brown stripes

9 yellow and brown stripes on scutum

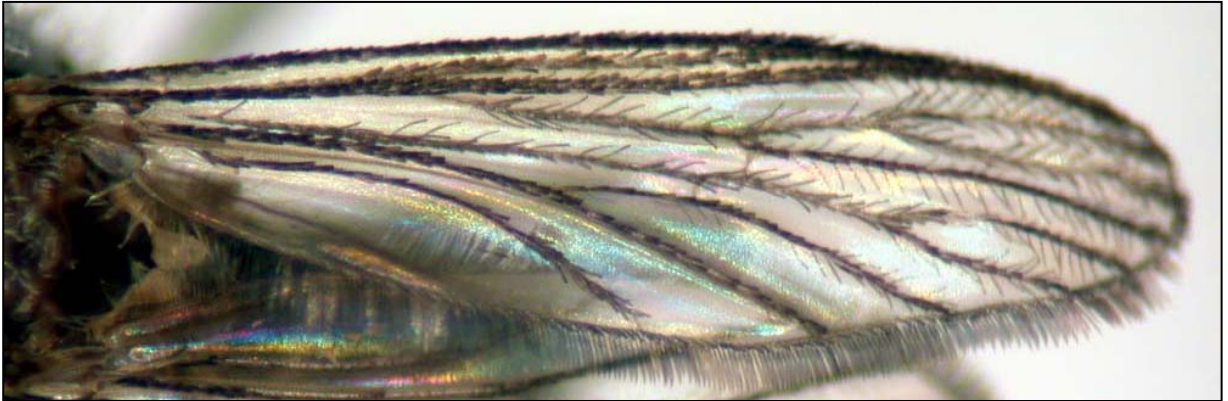


male

**Collection notes:** Larvae collected along the edges of deep grassy pools in Chidakwa, Jan-Feb 2005. Engorged adults collected inside sleeping houses, Lupata village, January 2006.

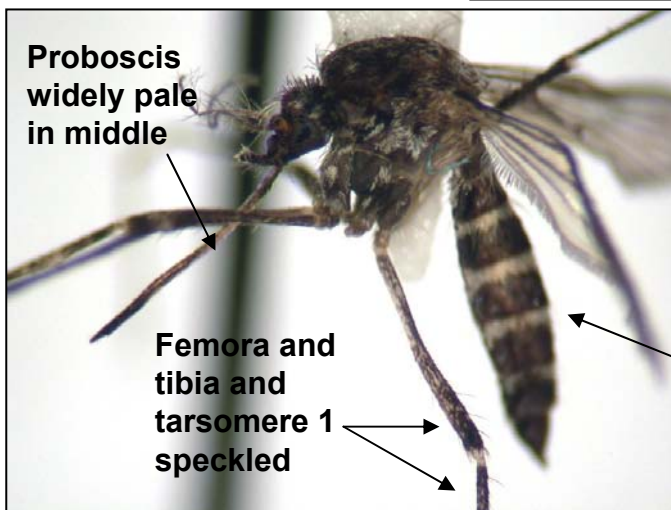


# *Aedes (Aedimorphus) hirsutus* (Theobald)



## Collection notes:

larvae collected from grassy pools in Chidakwa, Jan-Feb 2005 and muddy tire tracks. Adults collected during human landing collections, Lupata village, January 2006.



Proboscis widely pale in middle

Femora and tibia and tarsomere 1 speckled

Thoracic scale patches well developed, including 2 subspiracular patches

Terga 2-6 with basal white bands, straight margins

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# *Aedes (Aedimorphus) dalzieli* (Theobald)



Yellow scale scattered throughout mostly dark scutum scales; patches of white scales above wing base and on prescutellar area



## Collection notes:

Adults collected by human landing catch in Lupata village, January 2006.

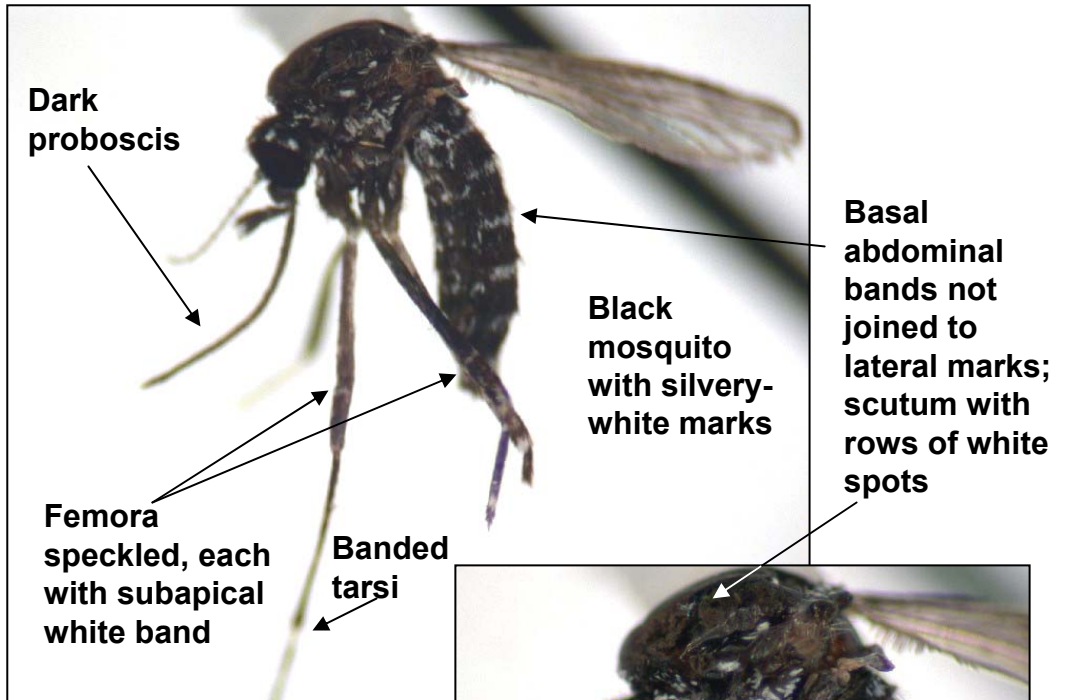


Wing dark with small basal pale spot on costa

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# *Aedes (Aedimorphus) vittatus* (Bigot)

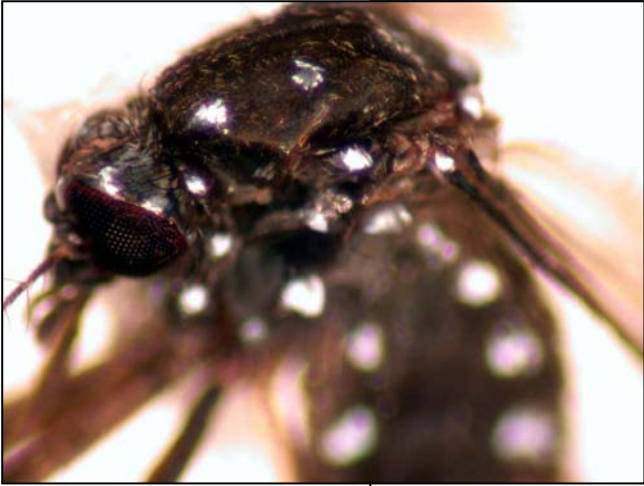


**Collection notes:** adults collected by CDC light trap

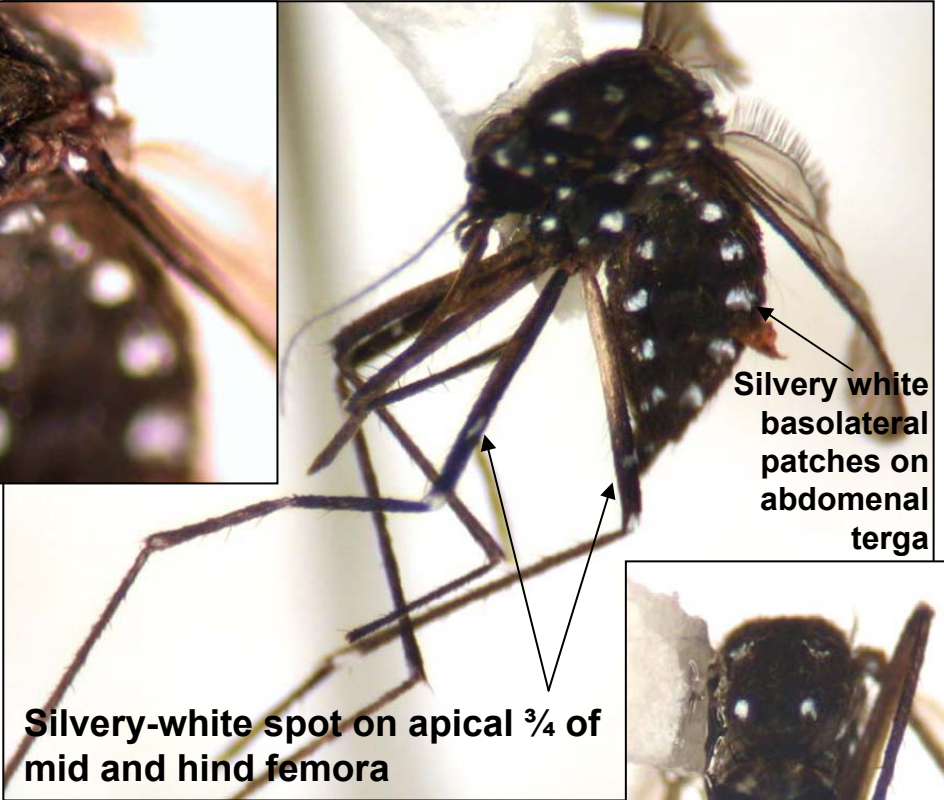




# *Aedes (Aedimorphus) argenteopunctatus* (Theobald)



Dark mosquito with broad, silvery white, scale patches. No post-spiracular or prealar scale patches.

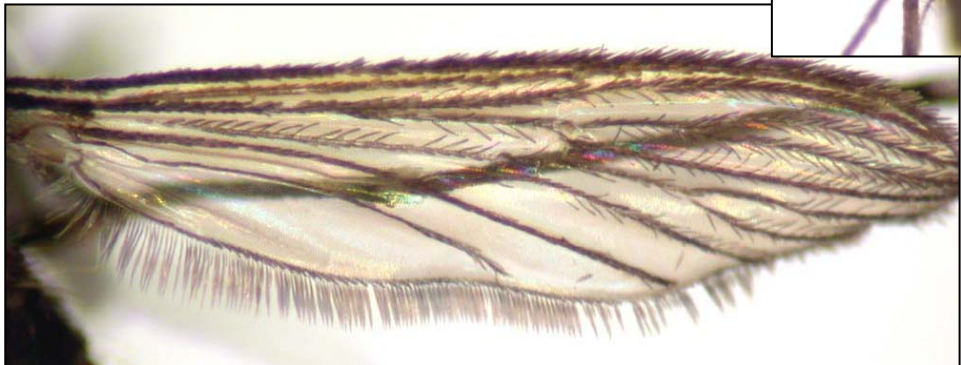


Silvery white basolateral patches on abdominal terga

Silvery-white spot on apical  $\frac{3}{4}$  of mid and hind femora



Collection notes:  
collected by human  
landing catch in Lupata,  
January 2006

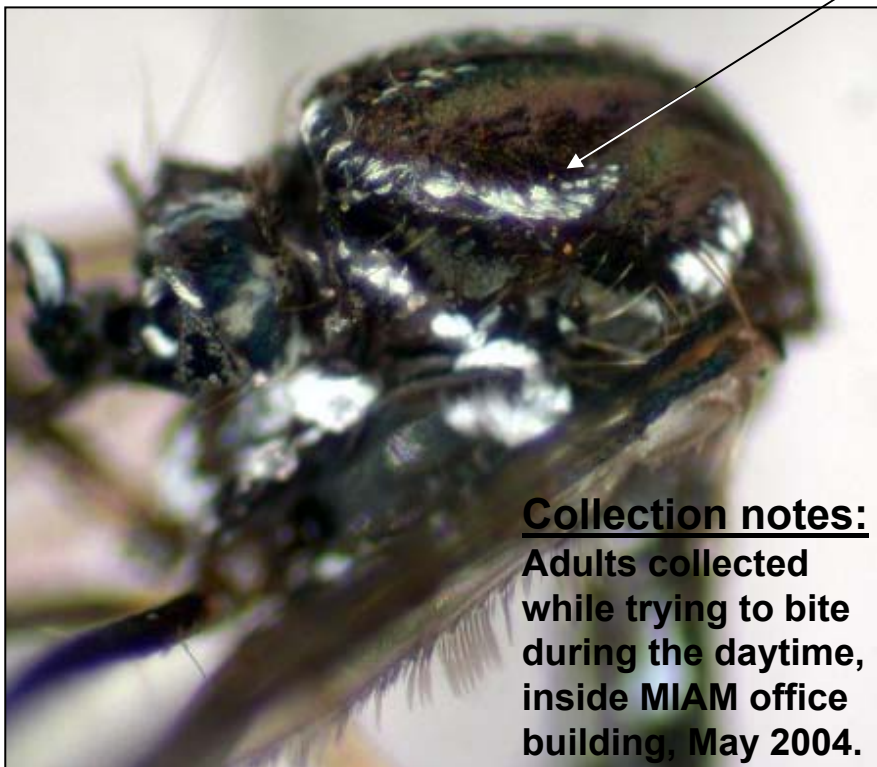


# *Aedes (Stegomyia) aegypti* (Linnaeus)



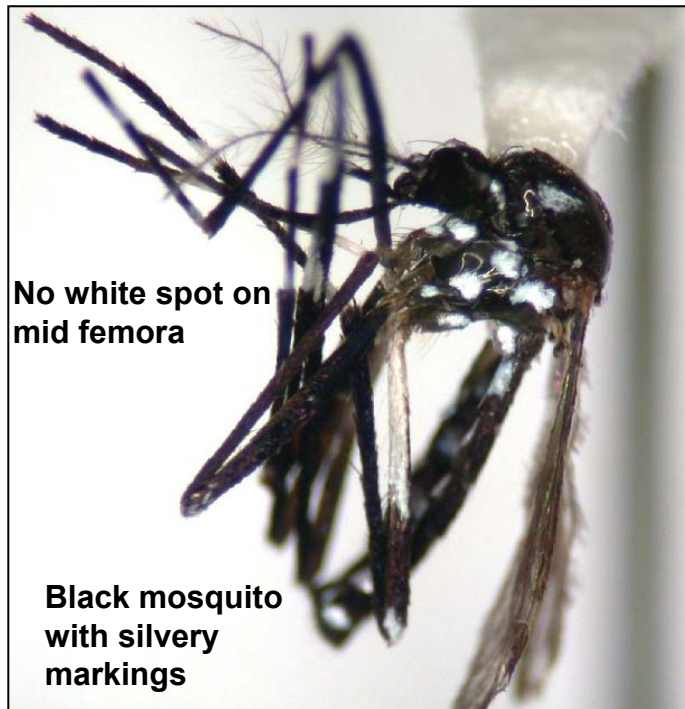
Black mosquito with  
silvery markings

Diagnostic  
lyre-shaped  
scale pattern  
on scutum



**Collection notes:**  
Adults collected  
while trying to bite  
during the daytime,  
inside MIAM office  
building, May 2004.

# *Aedes (Stegomyia) spp.* *dendrophilus* group



No white spot on mid femora

Black mosquito with silvery markings

Crescent-shaped scale patches in scutal fossae

**Collection notes:**  
collected by human landing catch, April 2005.



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March, 2006



# *Aedes (Mucidus) sudanensis* (Theobald)

Relatively long palps for *Aedes*



Large mosquito, with a “moldy” look due to broad, erect scales covering body and legs



**Collection notes:**  
collected in April 2005 in a CDC light trap hung next to a cattle kraal; larvae are predaceous

Wing with speckled black and white scales, cloudy appearance surrounding the r-m and m-cu cross veins





# *Culex (Culex) quinquefasciatus* Say

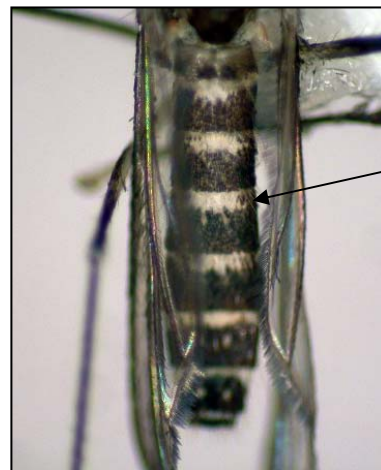


Mostly white underside of abdomen (sterna)



No post-spiracular scales or bristles

**Collection notes:** Very common and abundant October – January, especially in Chidakwa. Adults collected by pyrethrum spray catch in sleeping houses. Blood meals are from humans, cattle, dogs, and chickens.



Thick, half-moon-shaped, basal bands on abdominal terga

# *Culex (Culex) univittatus* Theobald

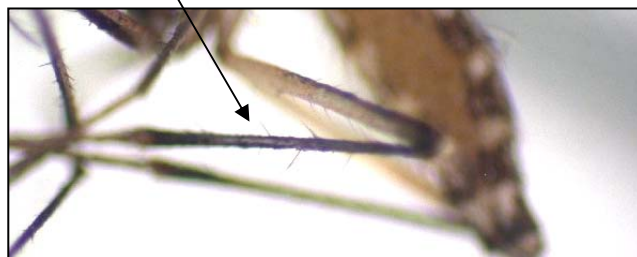
**Collection notes:**  
adults collected by  
pyrethrum spray  
catch between  
October and  
January, particularly  
in Chidakwa



Diagnostic  
longitudinal  
stripe present  
on hind tibiae



Post-spiracular  
scales present



# *Culex (Culex) antennatus* (Becker)



**Collection notes:** adults occasionally collected in pyrethrum spray catch

No post-spiracular scale patch



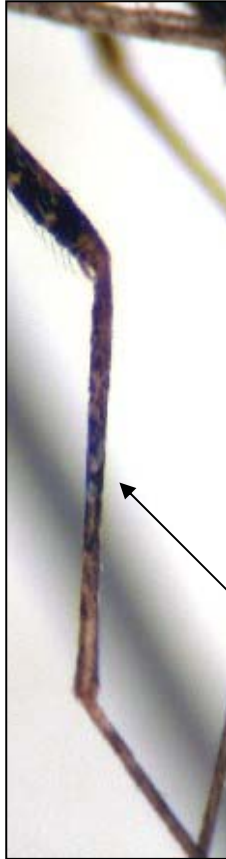
Abdominal sterna white



Abdominal terga unbanded, but with lateral patches on terminal segments



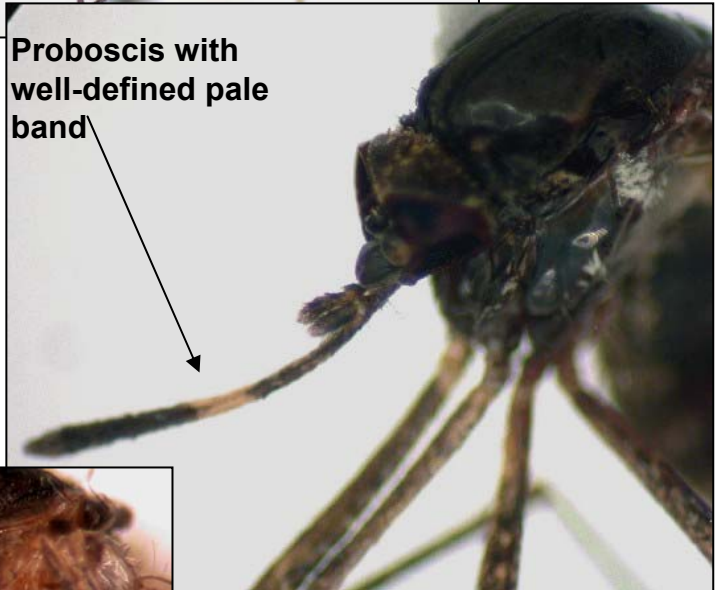
# *Culex (Culex) poicilipes* (Theobald)



Fore and mid-femora with row of 6-12 white spots



Proboscis with well-defined pale band



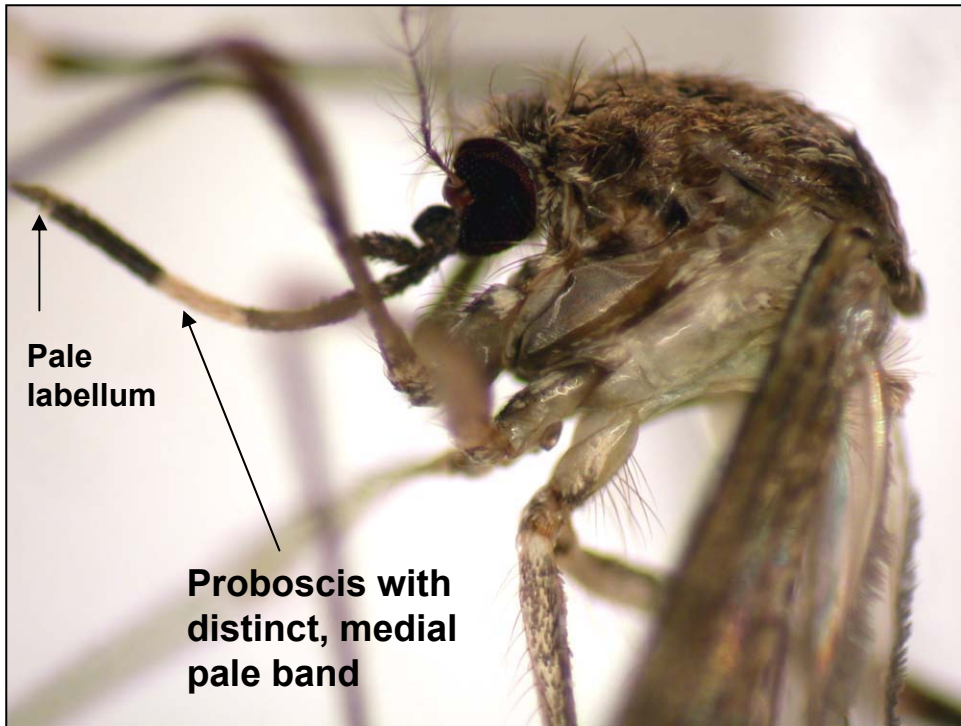
**Collection notes:** Adults occasionally collected in pyrethrum spray catches



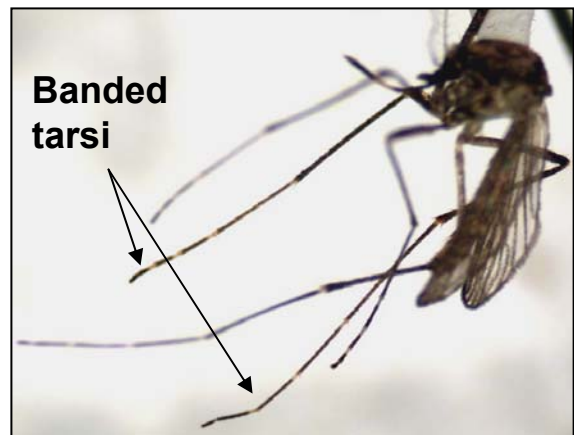
Lower mesanepimeral setae (bristles) absent

# *Culex (Oculeomyia) bitaenorrhynchus*

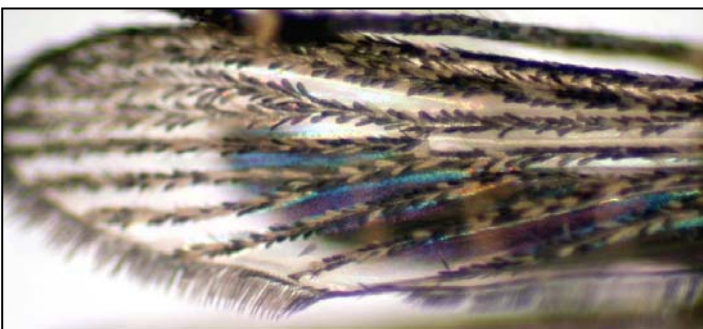
(formerly *Cx. ethiopicus* Edwards)



**Collection notes:**  
Collected larvae in  
Chidakwa, January  
2006



**Wing speckled with  
broad pale and dark  
scales**



Rebekah J. Kent

March 2006

# *Culex (Culiciomyia) nebulosus* Theobald



Grayish-brown  
mosquito with few  
markings

**Collection notes:** adults started appearing in CDC and human landing collections by mid-February, especially in Chidakwa. Also abundant in CDC traps hung near cattle pens in April 2005



Row of wide, pale  
scales lining the orbital  
margin of the eyes

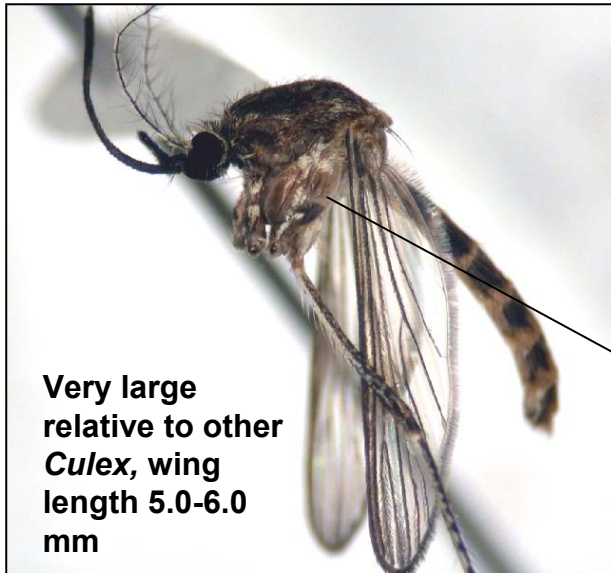
Vertical row of white  
scales lining the  
posterior edge of the  
mesokatepisternum



No bands on  
abdominal  
terga



# *Culex (Lutzia) tigripes* De Grandpré & De Charmoy

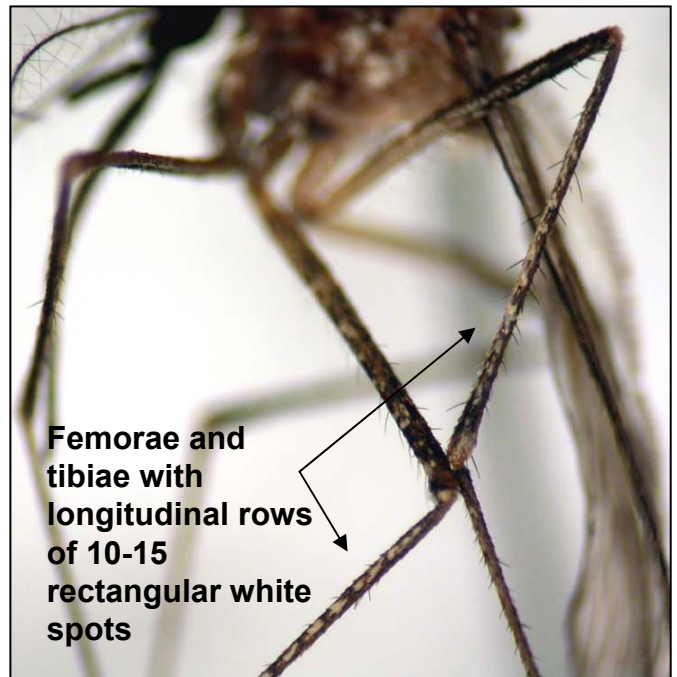


4 mesanepimeral setae

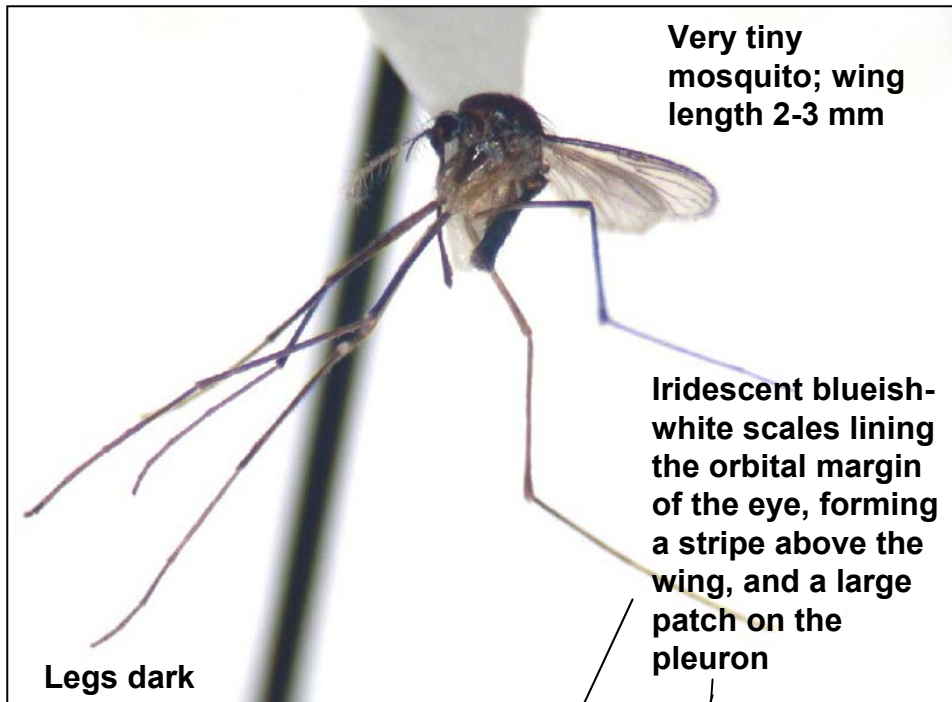


## Collection notes:

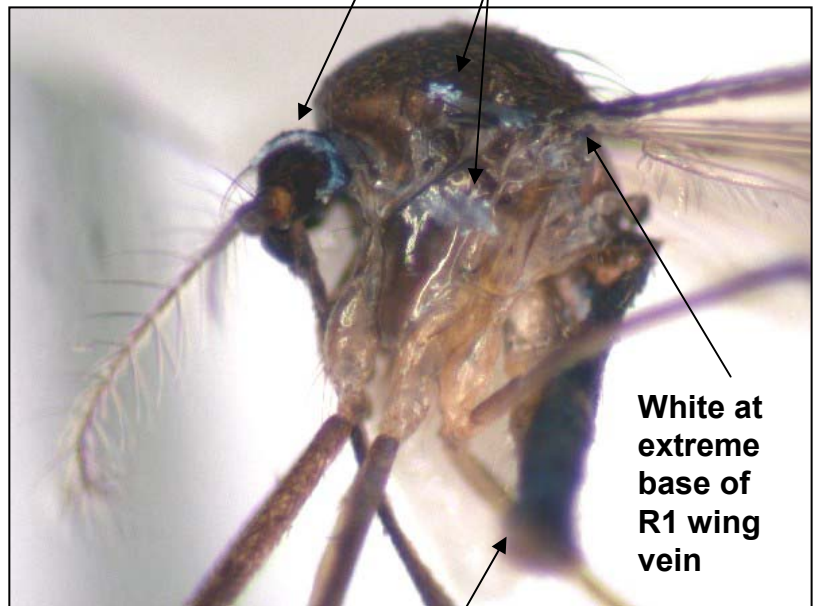
Larvae collected from sun-lit *Lupata* breeding site. Adults aspirated from inside houses. Larvae are predaceous on other mosquito larvae.



# *Uranotaenia (Uranotaenia)* *balfouri* Theobald



**Collection notes:** one adult collected during pyrethrum spray catch, December 2004, Chidakwa



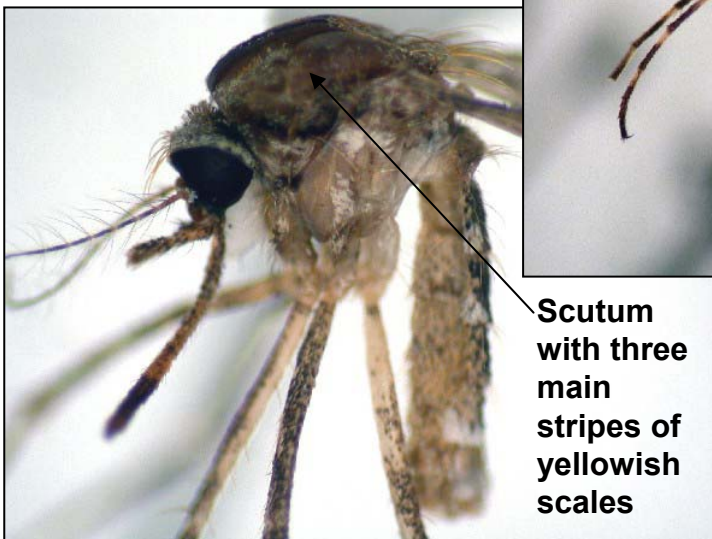
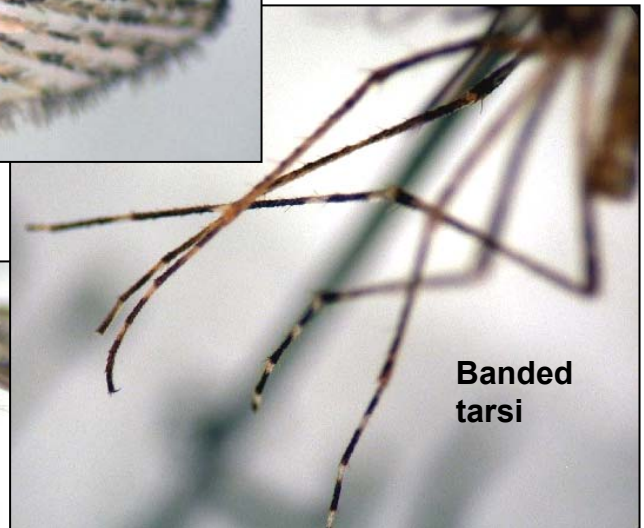
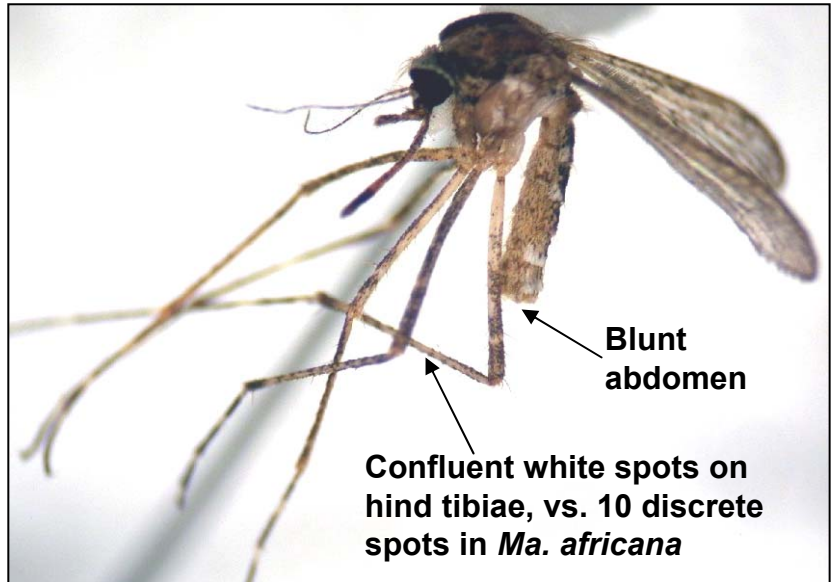
Abdominal terga dark, sterna pale

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March 2006

# *Mansonia (Mansonioides) uniformis* (Theobald)

**Collection notes:**  
adults collected by human landing catch, occasionally by pyrethrum spray catch and CDC trap

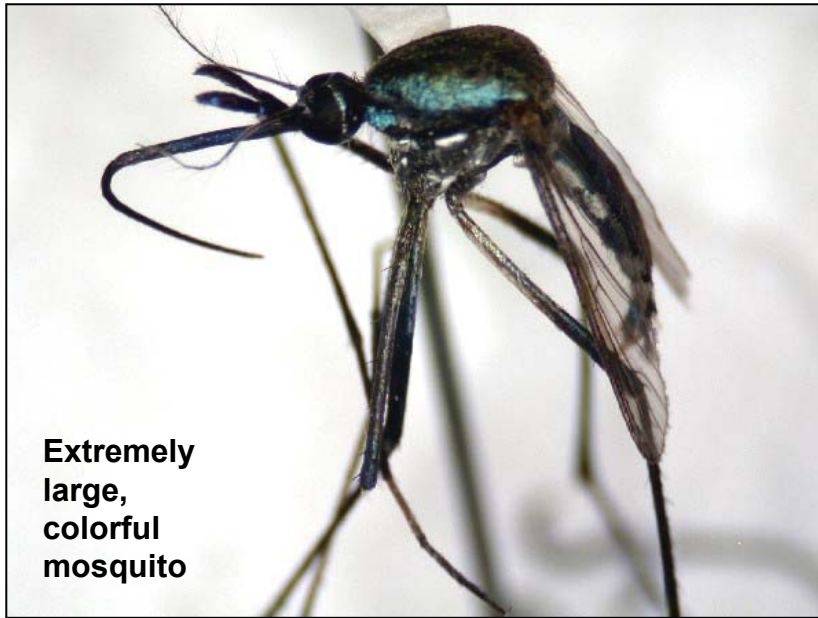


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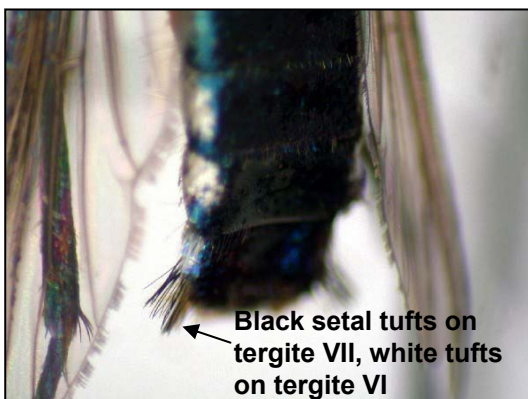
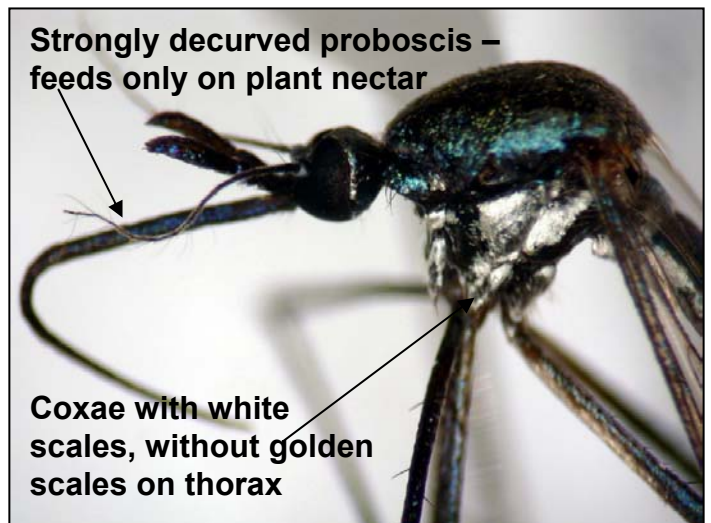
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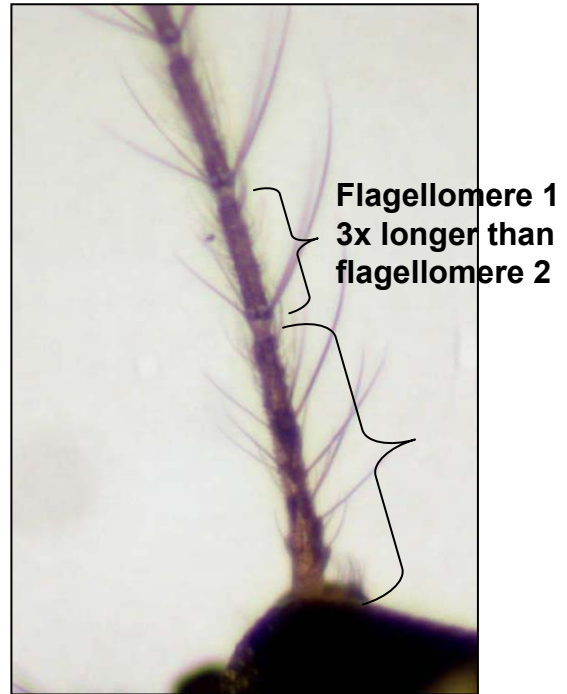
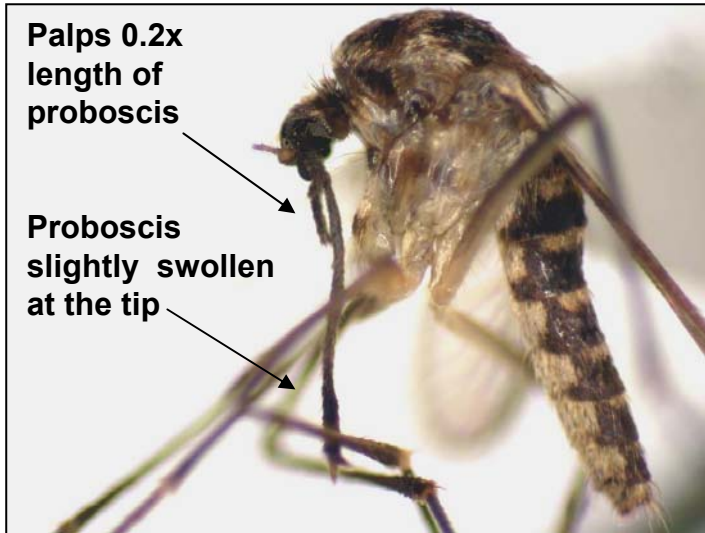
# *Toxorhynchites (Toxorhynchites)* *brevipalpis* Theobald



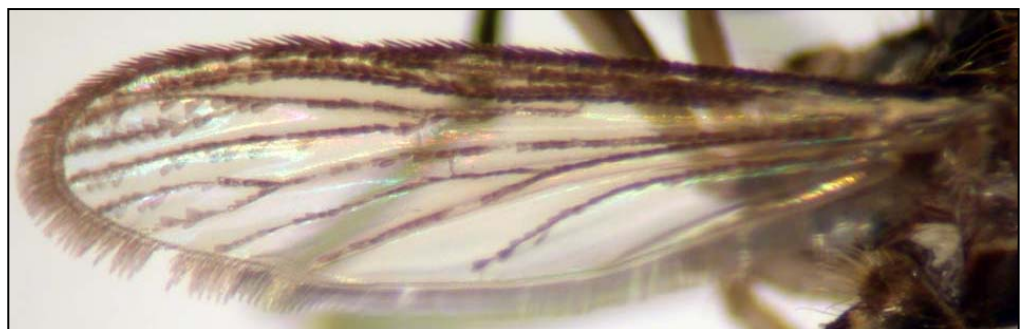
**Collection notes:** rarely collected because adults don't feed on blood; larvae predaceous on other mosquito larvae in tree holes



# *Ficalbia circumtestacea* (Theobald)



Patch of grey-white scales in the center of the meso-katepisternum



# References

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- The Walter Reed Biosystematics Unit. <http://www.wrbu.org/index.html>



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  - Seen Mudenda
  - Betham Dubeka
  - Buster Munsanje
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