



Newsletter - February 2010

Hi everyone. We have a great newsletter for you this month with three interesting articles covering a range of mozzie related studies including King Tut! If you print it out, you could use it as an excuse to go out and sit in the sun while you read - enjoy!

Rachel

SAMPLES

During February, a total of 813 samples were collected by staff from all 12 public health services, with 227 positive. Sampling numbers were about the same as last month although there were more positive samples, however they were down on last year. The specimens received were as follows:

Table with 3 columns: Species, Adults, Larvae. Rows include Aedes antipodeus, Aedes notoscriptus, Coquillettidia iracunda, Culex pervigilans, Cx. quinquefasciatus, Opifex fuscus, Exotics, and TOTAL.

performance measure. Over seven thousand larvae and four thousand adults were collected during 2009. These numbers are lower than previous years and it is believed to be as a result of relatively drier climate throughout 2009, including drought conditions throughout zone02 and zone01 in early and late 2009, respectively. No exotic saltmarsh mosquito specimens were captured and identified during 2009 within the NSP.

If you have any queries please let us know at the control centre.

Monica Singe
Technical Manager

ARCHIVED NEWSLETTERS

Just a reminder for anyone wanting to check out earlier issues of our newsletter or compare with last year etc, these can be found on our website. Go to the Literature and Links page and click on the NZBEL Newsletters link under Topics.

NEW TICK PROFILE UPLOADED

The latest New Zealand tick profile and photograph to be uploaded to our website is for Ixodes kerguelensis. The url is www.smsl.co.nz/biosecure/NZB/Pages/NZTicks.htm

NZBEL PUBLICATIONS PAGE UPDATED

There have been a couple of publications from NZBEL staff out recently. These are able to be viewed or downloaded from our website's staff publication page. The URL is http://www.smsl.co.nz/biosecure/NZB/Pages/Publications%20Lab%20Staff.htm

INCURSIONS/INTERCEPTIONS

There were nine interception callouts during February. All involved more Culex quinquefasciatus adults at Auckland International Airport except one, which was a non mozzie in a container at a devanning site in East Tamaki.

NSP UPDATE

The surveillance team are back from their break and into the field even though the hot dry weather is effecting the sampling conditions, with little water found in many areas of habitat and the far North in drought. Some higher tides have seen inundation and more are expected in March, creating suitable habitat.

The 2009 surveillance activity and statistical review has been completed and overall surveillance hours were exceeded in the majority of areas for the year. Of the total 766 active sites (excluding offshore island and archived sites), 99.7% met the 95%



HAPPY ST PATRICK'S DAY!



NEW ZEALAND BIOSECURE

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## STUDY SHOWS HOW MOSQUITOES SMELL HUMANS

**Source:** Reuters 3 Feb 2010, circulated on RSNZ news 5 Feb 2010

50 different genes that the mosquito *Anopheles gambiae* uses

Researchers have identified some of the tools that mosquitoes use to smell their human prey and said on Wednesday their findings might help find better repellents or ways to trap and kill the pests.

They found 50 different genes that the mosquito *Anopheles gambiae* uses to sniff out tasty humans, and characterised how each one responded to different uniquely human odours, including those known to attract mosquitoes.

Their analysis, published in the journal *Nature*, might greatly improve ways to repel mosquitoes - a field dominated by just a few compounds such as DEET.

Each gene controls a receptor - a molecular doorway that in this case attaches to a molecule of human aroma.

John Carlson of Yale University in New Haven, Connecticut, and colleagues transferred the 50 genes into the nerve cell of a type of fruit fly called *Drosophila*.

Fruit flies are well understood and don't try to smell out humans, so any mosquito gene that lights up in response to a human smell is likely to be one used by mosquitoes to guide them to their blood meals.

"The results may have implications for the control of malaria, one of the world's most devastating diseases," Carlson's team wrote.

"Screens for activators and inhibitors of selected receptors may identify compounds that attract mosquitoes into traps, interfere with their navigation, or repel them."

Malaria, caused by a parasite, is spread by female mosquitoes seeking human blood. It kills close to 1 million people every year, mostly children and most of them in Africa, according to the World Health Organisation.

Mosquitoes also carry a range of other human ills, including dengue fever, West Nile virus, yellow fever and several viruses that cause encephalitis, an often deadly inflammation of the brain.

In two other studies in the same journal, researchers said they found a special protein called plasmepsin V that the malaria parasite uses to get into human red blood cells, and said blocking this protein could lead to better malaria drugs.

## MOSQUITO-BORNE DISEASES

### KING TUT DIED FROM MALARIA, STUDY SAYS

**Source:** Reuters, 17 Feb 2010, <http://tvnz.co.nz/health-news/king-tut-died-malaria-study-says-3368233>

King Tutankhamen, the teen-aged pharaoh whose Egyptian tomb yielded dazzling treasures, limped around on tender bones and a club foot and probably died from malaria, researchers said.

There has been speculation about the fate of the boy king, who died sometime around 1324 BC probably at age 19, since the 1922 discovery of his intact tomb in Egypt's Valley of Kings.

Tests performed on 16 royal mummies found four, including Tut, had contracted a severe form of malaria that likely cut short Tut's reign - ruling out murder or some other sickness.

Scientists from Egypt, Germany and elsewhere, including Zahi Hawass of Egypt's Supreme Council of Antiquities, compiled results from genetic and radiological testing performed on the mummies between 2007 and 2009. The results clarify details about the 155-year-long



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18th Dynasty that included Tutankhamen, who inherited the throne at age 11.

The scientists speculated Tut was weakened by a broken leg possibly from a fall. That and a malaria infection led to his death, they believe.

Tut was afflicted with a cleft palate, mild clubfoot in his left foot and other bone ailments. He and some family members had a form of Kohler disease, which can cause foot bones to collapse from lack of blood but would not have been fatal.

"Tutankhamen had multiple disorders, and some of them might have reached the cumulative character of an inflammatory, immune-suppressive - and thus weakening - syndrome. He might be envisioned as a young but frail king who needed canes to walk," Hawass wrote in the Journal of the American Medical Association.

Besides the priceless gold artifacts found in Tut's tomb, he was also equipped for the afterlife with some 130 canes and staves - some with signs of wear - and a veritable pharmacy.



**Source: Reuters**  
**Egyptian archaeologists have found the tombs of two court officials, in charge of music and pyramid building, in a 4,000 year old cemetery from the reign of Pharaoh Unas**

The scientists were also fairly certain they identified the mummies belonging to Tut's

father, Akhenaten, and his grandmother, Tiye, based on shared blood groups.

They shot down speculation that Tut and his forebears had severe abnormalities, ruling out Marfan syndrome and another condition that could have led to enlarged breasts.

"It is unlikely that either Tutankhamen or Akhenaten actually displayed a significantly bizarre or feminine physique. It is important to note that ancient Egyptian kings typically had themselves and their families represented in an idealized fashion," Hawass wrote.

#### **FLIGHTLESS MOSQUITOES MAY CURB DENGUE**

**Source:** Reuters, 24 Feb 2010, <http://tvnz.co.nz/health-news/flightless-mosquitoes-may-curb-dengue-3380072>

Genetically altered mosquitoes that cannot fly may help slow the spread of dengue fever and could be a harmless alternative to chemical insecticides, US and British scientists said.

They genetically altered mosquitoes to produce flightless females, and said spreading these defective mosquitoes could suppress native, disease-spreading mosquitoes within six to nine months.

There is no vaccine or treatment for dengue fever, which is endemic in the tropics and is particularly prevalent in Asia and the western Pacific.

The disease, which causes severe flu-like symptoms and can kill, is spread through the bite of infected female *Aedes aegypti* mosquitoes.

"This could be the first in a new wave of products that might supplant insecticides," researcher Anthony James of the University of California, Irvine, said.

There are an estimated 50 million cases of dengue fever each year and about 2.5 billion people - two-fifths of the world's population - are at risk, mostly in Africa and south-east Asia, according to the World Health Organization.



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James's team, including a group from the British biotechnology firm Oxitec Ltd., altered mosquito genes to disrupt development of the insects' wing muscle.

The genetic modification grounded only the virus-carrying females and did not affect the males' ability to fly, they wrote in the Proceedings of the National Academy of Sciences.

The idea would be to distribute tens of thousands of eggs that would hatch out these genetically modified males, that would proceed to create a new generation of flightless, and thus doomed, daughters.

Because eggs are so small and easy to distribute, there would be far more genetically modified mosquitoes than natives, so they could in effect blot out the dengue-carrying population.

"We stack the numbers in our favour by releasing a lot of these things," James said.

"The technology is completely species-specific, as the released males will mate only with females of the same species," added Oxitec's Luke Alphey, who led the study.

Alphey said using genetically modified mosquitoes would be an environmentally friendly alternative to chemical insecticides and would be egalitarian.

"All people in the treated areas are equally protected, regardless of their wealth, power or education," he said.

Both Oxitec and Oxford University have applied for a patent.

The current work is focused on mosquitoes that carry dengue fever, but the researchers said it could be adapted to other species that spread malaria and West Nile fever.

## Mozzie Photo of the Month



**Photo: Darryl McGinn, Mosquito Consulting Services Pty. Ltd.**

Darryl getting besieged by mosquitoes in the Brisbane area while undertaking a field trial recently.