Mosquito control in Leanyer Swamp

Peter Whelan, MEB, CDC, Darwin

The problem mosquitoes

Although there are up to 15 different species of human biting mosquitoes in the Northern suburbs of Darwin, 5 species are of most concern, either due to their pest levels, or for their potential to cause disease. The greatest number of public complaints occur from the suburbs bordering Leanyer Swamp, after late dry season and early wet season hatches of the salt marsh mosquito *Aedes vigilax*. This mosquito breeds principally in the tidal coastal marshes and can fly relatively long distances. Three of the five species are *Anopheles* mosquitoes that can breed in a variety of habitats ranging from fresh to saltwater. The remaining species *Culex annulirostris*, the common banded mosquito, breeds in fresh water swamps, grassy flooded areas and storm water drains. The common banded mosquito and the salt marsh mosquito can transmit a number of viruses causing disease including Murray Valley encephalitis virus and Ross River virus, while the *Anopheles* mosquitoes are potential malaria carriers.

Mosquito control by drainage

There has been a continuing mosquito control drainage program throughout the Darwin area which started in 1983. This has been a joint Northern Territory (NT) Government and Darwin City Council program with the Medical Entomology Branch (MEB) of the Northern Territory Department of Health and Community Services (DHCS) having a coordinating role. Under this program, Leanyer swamp has been progressively drained by a network of channels and drains. Most of the major drainage works in the western Leanyer swamp, which is closest to the northern residential suburbs, were completed in 1986 and are now in a continuing maintenance phase. As a result, the western Leanyer swamp has been altered dramatically and it is no longer the major mosquito breeding area affecting a residential area in Darwin.

Other areas of the coastal swamps, such as the former RAAF bombing range in eastern Leanyer swamp, and the Holmes Jungle swamp, cannot be drained due to environmental or physical reasons. These areas are high productivity mosquito breeding areas which can produce mosquito pest problems due to the relatively long flight range of the various mosquito species which breed there.

Mosquito control by helicopter

The helicopter application of the biological insecticide *Bacillus thuringiensis* var. *israelesis* (*Bti*), was trialed for the first time in 1986. Large areas of Leanyer swamp that could not be drained were treated by applying the *Bti* to early stage larvae in the marsh areas. The helicopter spraying program began in October 1986, with 30ha of salt marsh breeding sites of *Aedes vigilax* successfully controlled after a large tide created suitable breeding sites. In November 1986, the combination of a large tide and heavy rain created over 220ha of mosquito breeding, and all of this area was successfully treated by similar applications over a two day period. Areas of breeding included Leanyer swamp, RAAF bomb craters, Holmes Jungle swamp, and Micketts swamp. Other spray operations were carried out in December 1986 against further hatches of the salt marsh mosquito. The results of these operations can be seen in the graphs on page 18.

This program is now a regular feature of mosquito control in Darwin and has proved a very efficient and practical method of salt marsh mosquito control, when there are often only 2 days available to treat large areas before the mosquito larvae reach the pupal stage where they cannot be controlled by insecticides.

Effectiveness of both programs

The MEB has a continuing mosquito monitoring program around Darwin, and the assessment of the results indicate the Leanyer swamp mosquito control program is a resounding success. The special mosquito traps set weekly around Leanyer swamp have verified that the programs can prevent large plagues of the salt marsh mosquitoes invading the northern suburbs. The 1986 graph indicated the first year since
mosquito monitoring began in 1976 that there was been no large plague of these mosquitoes in the Leanyer area.

Since 1983, the mosquito numbers have shown a steady drop in the Leanyer area. In 1986, there was a 70% decrease in the numbers of all mosquito species near Leanyer swamp compared with the 1983 figures. This includes an 80% reduction in the numbers of salt marsh mosquitoes. There was a 90% decrease in the numbers of the big black *Anopheles bancroftii*, falling from 2926 mosquitoes in the traps in 1983, to 294 in the traps for 1986. While there are variable results in following years due to large variations of rainfall and extent of flooding, and operational problems at times due to unfavourable wind conditions, these gains have largely been repeated in most other years.

For the 5 most important mosquito species found around Leanyer swamp, the numbers of 4 of them have now fallen below pest levels in the adjoining suburbs. This has meant a significant increase in the quality of life for northern suburbs residents, and a large decrease in the potential for mosquito borne disease. These successful and ongoing programs demonstrate the great benefits of preventative health measures, and illustrate a successful interdepartmental and local government cooperative effort.

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**Letter to the Editor**

Dear Editor

Good paper about *Diospyros maritima* (*The Northern Territory Disease Control Bulletin* Vol 14, No. 1, March 2007). I have seen a few other instances of severe skin irritation from this plant.

At Bardalumba Bay on Groote Eylandt in the 1980s a bloke was cutting a branch off one and sawdust landed on his chest between the lapels of his boiler suit and caused blistering and pain.

A traditional owner was digging out long yams near jungle at Cape Don in the 1990s and his arm rubbed the roots and it caused severe skin blistering and pain.

_Glenn Wightman_

Ethnobiology Project, Biodiversity Conservation Dept. of Natural Resources, Environment & the Arts

PO Box 496, Palmerston NT 0831.

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