Malaria mosquito population monitoring in South Africa

The Centre for Opportunistic, Tropical and Hospital Infections (COTHI), NICD-NHLS, provides a service for the identification of medically important arthropods for entomologists, medical practitioners, health inspectors and health authorities. This includes the identification of potential malaria vector mosquitoes to species as a service to the KwaZulu-Natal, Limpopo and Mpumalanga Malaria Control Programmes. These provinces are low malaria transmission areas that are prone to malaria epidemics.

In most instances malaria vector mosquitoes cannot be identified to species using external morphological characteristics alone and subsequent molecular methods are required. This is because the major vectors of malaria in South Africa, *Anopheles funestus* and *An. arabiensis*, are members of the *An. funestus* species group and *An. gambiae* species complex respectively. Both of these taxonomic groups also contain closely related, morphologically similar, non-vector species.

Between April 2012 and March 2013, 223 adult anopheline mosquitoes were collected from sentinel sites in KwaZulu-Natal Province, 1 102 from Mpumalanga Province and 424 from Limpopo Province (Figure 3), giving a grand total of 1 749 mosquitoes. These samples were preserved on silica and sent to COTHI for identification. In the first instance, each adult was morphologically assigned to a taxonomic group. Of these, 1 455 were identified as members of the *An. gambiae* complex, 164 were identified as members of the *An. funestus* group and 130 as other anophelines of no medical importance. Subsequent identification to species using multiplex PCR assays revealed the occurrence of *An. arabiensis*, *An. merus* (minor malaria vector) and *An. quadriannulatus* (non-vector) of the *An. gambiae* complex. *Anopheles rivulorum* (minor malaria vector) and the non-vectors *An. vaneedeni, An. parensis* and *An. leesoni* of the *An. funestus* group were also identified. No *An. funestus* sensu stricto were identified. Other non-vector anophelines identified included *An. demeilloni, An. rufipes, An. maculipalpis, An. pretoriensis* and *An. coustani*.

For vector incrimination, an enzyme-linked immunosorbent assay (ELISA) is routinely used to detect the presence of *Plasmodium* sporozoites in adult anopheline females. No sporozoite infections were detected in any of the samples.

These data have been reported to the respective provincial malaria control programmes. They serve as an indicator of the occurrence and prevalence of malaria vectors in each region and can be used to assist in the planning of ongoing control operations.

Source: Centre for Opportunistic, Tropical and Hospital Infections, NICD-NHLS; Malaria Control Programme managers (Limpopo, Mpumalanga and KwaZulu-Natal provinces)

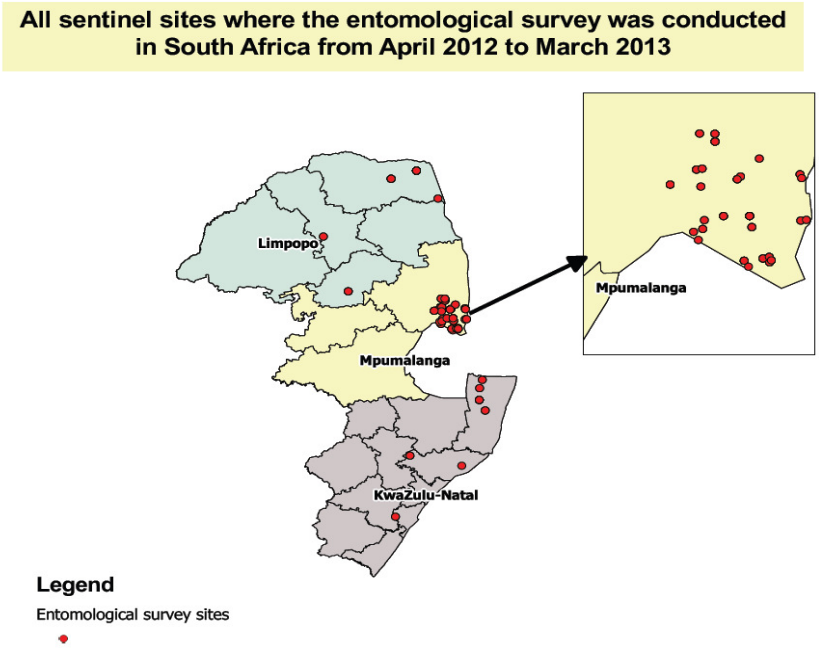

Figure 3: Survey sites for collection of anopheline mosquitoes, April 2012 to March 2013