A review of Vectors of Zika -Aedes

The Zika Virus (ZIKAV) was first isolated from the African forest and only a few human cases were documented until the first epidemic reported from the Pacific Island of Yap in 2007 (Weaver et al., 2016). ZIKAV transmission by sylvatic mosquitoes is almost unknown since only a few studies have found several species of mosquitoes positive for ZIKAV (Diallo et al., 2011) but the specific detection of the virus in the salivary gland which is a pre-requisite of mosquito transmission was confirmed only in 2 Aedes species (Diagne et al., 2015).

After the rural epidemic on the Yap Island where the suspected vector was *Aedes hensilli* (Ledermann et al.,2014), the ZIKAV emerge into an urban epidemic for the first time in French Polynesia in 2013 and the main vector was *Aedes aegypti* with a suspected secondary vector with *Aedes polynesiensis* (Loos et al., 2014). In 2015, ZIKAV was reported for the first time from Brazil.

While epidemic transmission of ZIKAV is reported to occur mainly in urban settings via the anthropophilic *Aedes aegypti* mosquito, as evidenced by limited field surveillance (Marchette et al., 1969; Olson et al., 1981) and experimental studies (Boorman and Porterfield, 1956; Cornet et al., 1979a; Li et al., 2012), *Ae. hensilli* and/or *Ae. polynesiensis* (Musso et al., 2014) may serve as vectors in Yap island and the pacific islands respectively.

In 2007 in Gabon, urban ZIKAV transmission was associated with *A. albopictus* (Girard et al., 2014). Further experimental studies (Wong et al., 2013) supported a role for Asian populations of *A. albopictus* as vectors of ZIKV transmission concomitantly with *Aedes aegypt*i (Li et al., 2012). Given its invasive nature and extensive geographic distribution in tropical as well as temperate settings, there is the potential for *A. albopictus* to become a ZIKAV vector in Europe

For the American region, recent laboratory studies on *Aedes aegypti* and *Aedes albopictus* have proven their competence in the amplification and transmission of ZIKA virus (Chouin-Carneiro et al., 2016) with some geographical differences since tis he study also found *Ae*. *aegypti* populations from Guadeloupe and French Guiana exhibited a higher dissemination of ZIKV than the other *Ae*. *aegypti* populations examined.

Currently, our knowledge of the vectors of ZIKAV in all reported studies, from Africa, Asia, the Pacific region and the Americas are pointing the *Aedes* mosquitoes as the main vectors. In urban settings, in particular, the evidence strongly suggests that *Aedes aegypti* is the main vector because this species is highly anthropophilic (McBride, 2016) and *Aedes albopictus* may play a secondary role as vectors. It is important, however, to further investigate the role that other species may play in ZIKAV transmission. To further strengthen our knowledge on the vectors of ZIKAV, some institutions such as Fiocruz in Brazil and Pasteur Institute in Paris are currently testing other mosquito species such as Culex for their potential competency for ZIKAV. The results are expected soon.

On 29th March 2016, as part of a panel discussion (webinar) in the NIH sponsored conference on Zika, Scott Weaver (University of Texas Medical Branch) mentioned that his lab has been testing mosquitoes collected in Mexico at a site where human ZIKAV infections

have been detected. He said that they have identified only *Ae. aegypti* infected with ZIKV. *Ae. albopictus* & *Cx. quinquefasciatus* have been tested, but none have contained detectable viral RNA (probable PCR assay). The WHO secretariat has contacted the research group for further information.

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