

Meet the Tiger Mosquito in Lebanon: A Growing Health Concern



Dr. Nabil Haddad
Laboratory of Immunology
and Vector-Borne Diseases
Faculty of Public Health
Lebanese University (LU)
Dean of the Faculty
of Public Health-LU

What is the Tiger Mosquito?

The Tiger Mosquito, scientifically known as *Aedes albopictus*, is an exotic species of small black-and-white mosquito that bites humans during the day (Photo).



Female of the tiger Mosquito. Source: Courrier Arabe, July 2022

This mosquito originates from Southeast Asia and the Western Pacific and Indian Ocean islands. Despite being a tiny insect, the Tiger Mosquito is considered one of the most invasive mosquito species globally. It has become a global traveler, adapting to various environments worldwide. Indeed, over the past five decades, propelled by increased global trade and population movements, this invasive mosquito succeeded to establish in many countries around the world, including Lebanon. In Europe alone, the presence of this mosquito is reported from 27

countries (Map).

Females of this mosquito lay their eggs inside items that can hold stagnant water, such as tires, flowerpots, clogged drains, vases, barrels, rainwater manholes, etc). Therefore, these mosquitoes can easily breed in urban and peri-urban environments close to human settings.

What are the Health Risks Associated to this Mosquito?

The Tiger mosquito has been linked to local transmission of Chikungunya, Dengue, and Zika viruses in Europe. It has also shown experimental capabilities to transmit at least 26 different viruses. Chikungunya, Zika, and Dengue viruses pose significant public health concerns around the world. Chikungunya is characterized by fever and severe joint pain, often leading to debilitating symptoms.

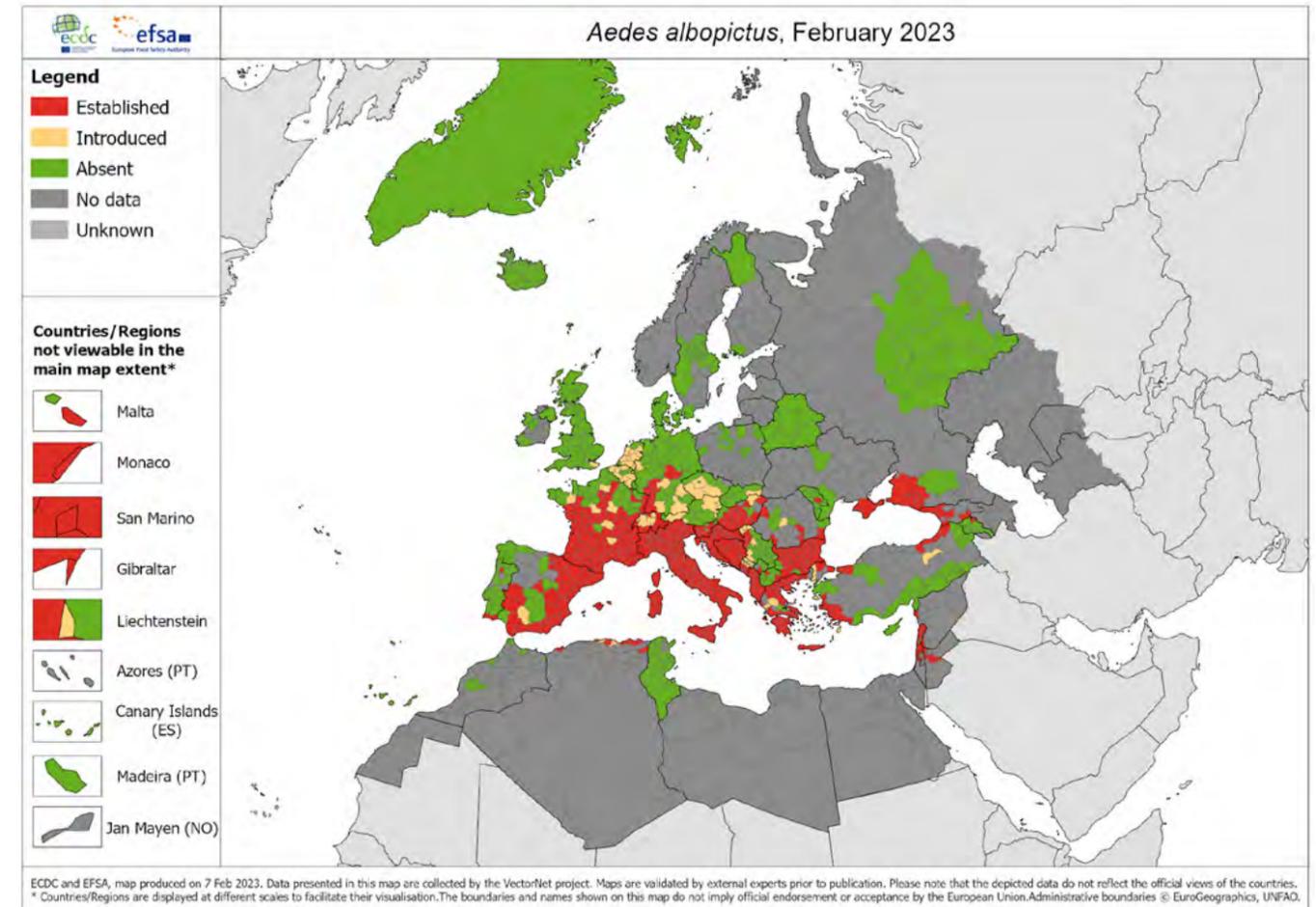
Zika gained global attention due to its association with birth defects, particularly microcephaly in infants born to infected mothers. Dengue, on the other hand, presents as a flu-like illness with high fever and severe muscle pain, occasionally progressing to severe forms like Dengue Hemorrhagic Fever or Dengue Shock Syndrome. Dengue affects millions of people annually in tropical and subtropical regions leading to important hospitalizations and economic costs.

Presence in the Middle East

In the Middle East, the Tiger Mosquito has been reported in many countries on the eastern side of the Mediterranean Sea, including Turkey, Syria, Lebanon, Palestine and Jordan. Further east, it has also been reported in Iran and Pakistan.

Current Situation in Lebanon

In Lebanon, the Tiger Mosquito was first observed in 2002, mainly in coastal areas, and has since expanded its distribution.



Distribution map of the Tiger Mosquito as recorded in the Mediterranean basin in 2023. Source: European Centre for Disease Prevention and Control- ECDC

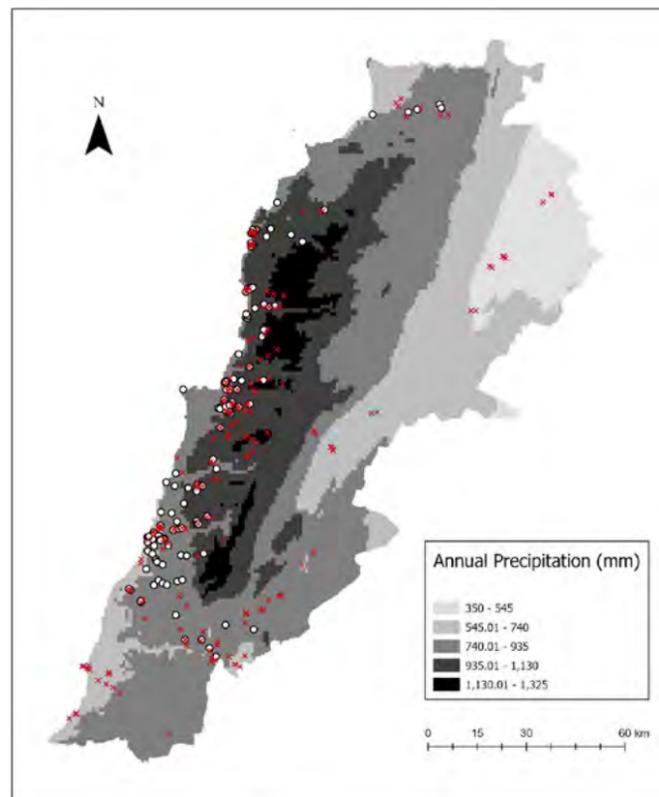
Since 2010, the medical entomology team of the Laboratory of Immunology and Vector-Borne Diseases at the Faculty of Public Health of the Lebanese University has been conducting several studies to track the spread of this mosquito and assess related health risks.

After inspecting more than 400 geographic sites over Lebanon, the medical entomology team reported a significant spread of *Aedes albopictus* mainly on the western versant of the Mount Lebanon chain characterized by relatively important humidity and precipitation levels. It was also observed at the northern (Akkar) and southern (Marjayoun) border areas (Map). However, the Tiger Mosquito was reported absent from arid and semi-arid areas of the Bekaa valley (Zahle, Baalbeck and Hermel districts) where precipitation levels are relatively low. The highest density of the mosquito was recorded in urban settings located between the coastal line and middle

altitude (500 m).

Moreover, the same team at the Faculty of Public Health assessed the capacity of the Lebanese populations of Tiger Mosquito to transmit different viruses. For that, mosquitoes reared in the Laboratory were fed with blood meals infected with Chikungunya, Dengue and Zika viruses. Results show that local populations of this mosquito were able to transmit significantly Chikungunya virus. In fact, 30% of tested mosquitoes were able to secrete this virus into their saliva, which is a mandatory step to ensure transmission to human hosts during the mosquito bite. This transmission ability was less marked for Dengue and Zika viruses. Both viruses took significantly more time to appear in the mosquito saliva.

As of now, Lebanese health authorities have not reported local transmission of these viruses. However, in 2012, a case of Dengue virus infection was identified in a patient



Average annual precipitation map showing collection points of *Ae. Albopictus* in Lebanon during 2015 and 2018. White dots and redmarks represent presence and absence locations respectively. Source: Haddad and collaborators (2022). PLoSNegl Trop Dis 16(2): e0010206. <https://doi.org/10.1371/journal.pntd.0010206>

without a history of travel, suggesting a potential local occurrence. Given the significant influx of workers and expatriates returning to Lebanon from regions in South America and South Asia where these viral diseases are endemic, the likelihood of local transmission in Lebanon remains a concern that necessitates vigilant monitoring and preventive measures.

What Is to Be Done?

The invasion of the Tiger Mosquito in Lebanon is not just a matter of mosquito bites. The geographical expansion of this mosquito, in addition to its proven ability to transmit various viral pathogens, pose significant health risks. It is about time for Lebanon to allocate resources to national mosquito control programs, promote targeted insecticide use and intensify public awareness in order to restrict the breeding of the Tiger Mosquito around households by removing all stagnant water. Only through concerted efforts can Lebanon effectively mitigate the potential risks associated with the Tiger Mosquito and protect the health of its population.

Infos

Cancer de la Peau: un Vaccin Thérapeutique dès 2025

Un véritable espoir dans le domaine de l'oncologie. Le patron de Moderna, Stéphane Bancel, a estimé possible auprès de l'AFP que le vaccin thérapeutique développé par la compagnie contre le cancer de la peau soit approuvé dès 2025, après de nouveaux résultats positifs annoncés. Ce vaccin thérapeutique n'est pas destiné à empêcher le développement de la maladie comme un vaccin classique, mais bien à la traiter une fois apparue. Il utilise toutefois le même principe : aider le système immunitaire du patient à se défendre lui-même contre la maladie. « On pense que le produit, dans certains pays, pourrait potentiellement être lancé sous une approbation accélérée à l'horizon 2025 », a déclaré Stéphane Bancel lors d'une interview. Ce calendrier est notamment encouragé par des résultats

publiés par Moderna montrant une amélioration, dans le temps, des chances de survie grâce au traitement qui utilise la technologie de l'ARN messenger ayant fait ses preuves contre le Covid-19.

Lors d'un essai sur environ 160 personnes atteintes d'un mélanome de stade avancé, la prise du vaccin en même temps que le médicament anticancéreux Keytruda a permis, sur une période de trois ans, de réduire de 49 % le risque de réapparition du cancer ou de décès, comparé aux patients uniquement traités avec l'anticancéreux. Moderna avait déjà annoncé l'année dernière les résultats de suivi sur deux ans, avec alors une réduction de 44 % des risques.

Dimma
HEALTHCARE