



Dear network members,

Here is few information to keep you updated of what's going on within the **MediLabSecure Medical Entomology Sector**!

NEWS FROM MLS.ENTOMO

> ESOVE Congress (October 2024)

The 23rd European Society for Vector Ecology (ESOVE) Conference, held in Montpellier from October 14 to 17, 2024, provided an exceptional platform aligned with MediLabSecure's One Health mission. Under the theme "One Health in Action: Supporting and Accelerating the Bridging of Vertebrate and Plant Health Communities" the conference underscored the need for collaborative, multisectoral approaches to tackle vector-borne diseases—a focus that resonates deeply with MediLabSecure's commitment to fostering cross-disciplinary public health initiatives across Europe and neighboring regions. Next SOVE Congress is scheduled to take place in Crete, Greece, in October 2025.



-Dr. Perparim Kadriaj and **Dr. Violeta Santrac**, two beneficiaries of a recent training course held in Tirana, Albania, from September 4th to 8th, 2023, represented MediLabSecure by highlighting the benefits they gained from the course. They presented a poster titled "Integrated Surveillance and Risk Mapping of Aedes albopictus Vectors in Urban Environments Using the VECMAP App: A Multinational Training Initiative finding". **-Dr. Vanessa Lagal** represented MediLabSecure by delivering a presentation titled "MEDILABSECURE: A One Health Network to Improve Preparedness and Response Capacities to Emerging Vector-Borne Diseases Increased by Environmental and Climate Change."

-Dr. Bulent Alten delivered a talk titled "Success in Mosquito Control: An Integrated Approach in Istanbul, Turkey" which focused on vector surveillance, surveillance systems, community-based surveillance, and management of vector-borne diseases.

-Dr. Cedric Marsboom from Avia-GIS presented "VectorNet3: The Third Iteration of the European Network for Medical and Veterinary Entomology".

⇒ Find the Congress abstracts here.

> Two webinars (October 2024)

- <u>Webinar on ARBOCARTO</u> (Tuesday, October 8th). A webinar introduced 38 participants from 11 countries to Arbocarto, a predictive mapping tool for predictive mapping of population densities of Aedes mosquitoes, vectors of the dengue, Chikungunya and Zika viruses. Organized by IRD/MIVEGEC, with panelists from INRAE and Cirad, the event showcased Arbocarto's ability to map mosquito populations and identify high-risk areas. Live demonstrations of different tool versions were followed by discussions on their features.

- <u>Webinar on Serious Games</u> (Tuesday, October 22nd). A webinar hosted by IRD/MIVEGEC introduced 30 participants from 13 countries to the use of serious games in public health education and vector surveillance. Organized with Cirad, ExposUM, and ARS La Réunion, the session highlighted games like "Stop Aedes" and "GoTick" for engaging communities and raising awareness of vector-borne diseases. ARS La Réunion shared practical experiences with "Stop Aedes," followed by discussions on the impact and evaluation of serious games in health education.

> Urban-vector mapping training (October 2024)

As part of the ongoing training organized by IRD and AVIA-GIS in Tunis, this second phase focused on **QGIS application**. Led by Dr. Alan Juache (Avia-GIS), the online sessions took place from **October 10th to 31st, 2024** and trained participants in processing and analyzing field data using QGIS. Covering GIS fundamentals, QGIS tools, and geoprocessing techniques, the training provided essential skills for integrating and mapping VECMAP data effectively.

> A <u>LinkedIn Group</u> dedicated to MediLabSecure Medical Entomology Sector. This group is strictly focused on sharing information, resources, and updates related to medical entomology. It aims to connect professionals and experts in the field to foster collaboration and knowledge exchange. Join us and invite relations that would be interested in!

MEDILABSECURE IN SHORT

> The MediLabSecure project (phase III) officially concluded in November 16th, 2024, after a celebrating a decade of strengthening the capacity of laboratories and institutions across 22 countries to combat vector-borne diseases, leaving behind a robust One Health network of experts and reference centers.

> See more on medilabsecure.com and in MediLabSecure's last newsletter.

NEWS FROM MEDICAL ENTOMOLOGY WORLD

> Improve your understanding of epidemics and their management with the <u>MOOC Social</u> <u>Sciences and Humanities and Epidemic management</u> (Institut Pasteur) available in both French and English.

> BlueSky has become a hub for the entomology community, with many experts sharing insights on vector-borne diseases and research. Here are some accounts to follow: @globalvectorhub.bsky.social; @entsocamerica.bsky.social; @arimcollection.bsky.social and the channel <u>#Mosquitoes</u>.

ENJOY READING

-Articles

• A-J Trájer, I Hoxha, B Xhekaj, K Platzgummer, V Dvořák, A-G Obwaller, J Stefanovska, A Cvetkovikj, J Walochnik, *K Sherifi, E Kniha, <u>Ecological setting of phlebotomine sand flies in</u> <u>the Republic of Kosovo</u>. *Heliyon*, 10(12), June 2024.

Sand flies are key vectors of *Leishmania spp*. and phleboviruses, with diverse fauna identified in Kosovo's humid continental climate. This study analyzed environmental and climatic factors, finding that wind speed, temperature seasonality and topography influenced sand fly distribution. Western Kosovo showed the highest diversity and risk for sand fly-borne diseases, *with Phlebotomus neglectus* and *P. perfiliewi* as main vectors. Tailored control strategies are needed to address regional risks, particularly in western areas vulnerable to leishmaniasis amid changing environmental conditions.

• L Babayan, *A Manucharyan, *L Paronyan, H Vardanyan, *R Danielyan, G Melik-Andreasyan, J Achenbach, <u>Distribution of vectors and arboviruses, and healthcare workers'</u> <u>knowledge of vector-borne diseases in Armenia</u>. The Journal of Infection in Developing Countries. 18. 1442-1449, September 2024.

Armenia's geographical and climatic conditions supports mosquitoes, sandflies, and ticks that transmit various diseases. In 2021, this study mapped vector distribution and tested for arboviruses, finding 20 mosquito species and 11 tick species. PCR testing revealed Crimean-Congo hemorrhagic fever virus (CCHFV) in ticks but no West Nile virus (WNV) in mosquitoes. Healthcare worker surveys showed higher awareness of arboviral diseases among epidemiologists, infectious disease specialists, and family doctors than other specialists. The study highlights the need for better surveillance and knowledge of arboviral diseases to improve disease monitoring and public health interventions.

• Z Gharbi, *A Ouni, G Balti, *A Bouattour, A Chabchoub, *Y M'ghirbi, First Evidence of Rickettsia conorii Infection in Dogs in Northern Tunisia, Veterinary Sciences, September 2024.

A cross-sectional study in Tunisia carried out between April 2021 and June 2022 assessed the role of dogs in the circulation of rickettsiosis. Specific IgG antibodies against *Rickettsia conorii* were tested in 136 dogs, revealing a 55.14% seropositivity rate. 51 seropositive dogs showed clinical signs such as fever and anemia, but no Rickettsia DNA was found in blood samples. However, qPCR detected *R. conorii* subsp. raoultii in 7 tick pools. The study emphasizes the need for a One Health approach to raise awareness about controlling tick infestations and canine zoonoses.

• *K E Benallal, M Mefissel, Y Dib, J Depaquit, D Kavan, Z Harrat, V Dvorak, P Volf, P Halada, **Phlebotomine sand fly survey, blood meal source identification, and description of Sergentomyia imihra n. sp. in the central Sahara of Algeria**, *Parasites & Vectors*. 17, November 2024.

Phlebotomine sand flies (Diptera: Psychodidae) are important vectors of various pathogens. In the Old World, *Phlebotomus* species are primary vectors, while *Sergentomyia* species have not been proven to transmit human pathogens. In this article, Algeria, significantly affected by human leishmaniasis, was the focus of an entomological survey in Ghardaïa and Illizi provinces, both known for leishmaniasis cases. Sand flies were collected and identified using morphological, molecular, and MALDI-TOF MS techniques. The survey identified *Sergentomyia antennata* and *S. fallax* in Ghardaïa, and *Ph. papatasi* and *Ph. alexandri* in Illizi, with blood meal analysis revealing various mammalian hosts. This study led to the description of a new *Sergentomyia* species, increasing Algeria's sand fly species count to 27.

• *J Tutagata, N Pocquet, *B Trouche, *J Reveillaud, <u>Dissection of Mosquito Ovaries,</u> <u>Midgut, and Salivary Glands for Microbiome Analyses at the Organ Level</u>. Journal Of Visualized Experiments (212), October 2024.

The rise of mosquito-borne diseases like malaria and dengue, coupled with insecticide resistance and a lack of vaccines, underscores the need for innovative approaches targeting mosquito microbiota. Metagenome-Assembled Genomes (MAGs) offer insights into the roles of microbes in mosquito organs like ovaries, midgut, and salivary glands, essential for pathogen transmission. This study presents an optimized protocol for contamination-free dissection, enabling precise microbiome analysis at the organ level to inform novel vector control strategies. A video illustrating this protocol will be released soon.

• M-A González, A Chaskopoulou, L Georgiou, E Frontera, F Cáceres, M Masia, R Gutiérrez-Climente, G L'Ambert, H Osório, G Seixas, F Defilippo, M Calzolari, F Montarsi, A Mosca, *J Figuerola, <u>Mosquito management strategies in European rice fields: Environmental and</u> <u>public health perspectives</u>, *Journal of Environmental Management*, Volume 370, November 2024.

Rice paddies are vital for food production but also serve as breeding grounds for mosquito vectors like *Culex*, *Aedes*, and *Anopheles*, posing health risks. Effective mosquito management must be cost-effective, sustainable, and legislatively supported. In Europe's top five rice-producing countries (Italy, Spain, Greece, Portugal, and France), mosquito issues and control efforts vary. *Aedes caspius* contributes to nuisance, while *Culex* species play a key role in West Nile virus (WNV) transmission. Biological larvicides with *Bacillus thuringiensis* serovar. *israelensis* are the main control method, with adulticides used during urban epidemics. Adaptive regional strategies are essential for managing mosquito-related challenges.

• C Teillet, R Devillers, A Tran, R Marti, M Demarchi, T Catry, J Rwagitinywa, J Restrepo, N Dessay, E Roux, **Spatial and temporal predictions of mosquito potential breeding sites and densities: integration of satellite imagery, in-situ data, and process-based modeling**. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. XLVIII-3-2024. 539-545, November 2024.

Dengue fever, transmitted by *Aedes aegypti*, remains a major threat due to the lack of reliable vaccines. Effective vector control is crucial but faces challenges like mosquito resistance to insecticides and high costs. In French Guiana, geospatial data and entomological surveys were conducted using the Arbocarto process-based model to predict mosquito breeding sites and densities. Higher *Aedes aegypti* densities were found in urban areas, influenced by temperature, precipitation, and housing types. This study underscores the utility of integrating remote sensing and predictive models to enhance vector surveillance and dengue prevention.

• A Vasic, B Milovanović, D Glišić, *M Kavran, J Kureljušić, A Živulj, B Kureljusic, V Milicevic, The transmission routes of African swine fever during an outbreak in Serbia July-August 2023: African swine fever virus detections in environmental samples and insects. Frontiers in Veterinary Science. 11. 1-8, November 2024.

African swine fever (ASF) is a highly contagious disease of pigs caused by an arbovirus (ASFV). While direct animal contact is the main transmission route, the role of environmental contamination and insects remains unclear. During a 2023 epidemic in Serbia, environmental samples and insect specimens, including flies and larvae, were collected from affected areas. While no ASFV DNA was detected in environmental samples or traps, it was found in fly larvae (*Lucilia sericata*) from carcasses and one *Stomoxys calcitrans* fly under experimental conditions. These results suggest a potential role for flies in the mechanical transmission of ASFV during outbreaks.

• A Klobučar, *M Kavran, S Petrinić, M Curman Posavec. <u>Temporal Activity and</u> <u>Distribution of the Invasive Mosquitoes Aedes albopictus and Aedes japonicus in the</u> <u>Zagreb Area, Croatia. Tropical Medicine and Infectious Disease</u>, 9(11), November 2024.

Aedes albopictus and Aedes japonicus, invasive mosquito species, were monitored in 12 cemeteries in Zagreb from 2017 to 2020 using ovitraps. Ae. albopictus dominated, present in all cemeteries with higher population density, while Ae. japonicus, though less frequent, showed consistent presence. Cemeteries, with their water-filled containers, were hotspots for these species, highlighting the need for integrated mosquito management and public education to control their spread.

<u>-Books</u>

• M Kosoy, P Imnadze, L Malania, N Bolashvili, A Kandaurov, C Webb, K Gilbertson, *R Danielyan, *A Manucharyan. <u>Atlas of Zoonotic Diseases in the South Caucasus</u>, LEPL National Centre For Disease Control and Public Health (NCDC), Georgia, 2024.

Zoonotic diseases, infectious diseases transmitted from animals to humans, account for 75% of recently emerging human infections. Veterinarians and animal husbandry workers face higher risks due to frequent exposure to animal carriers of pathogens. These individuals can act as biological sentinels for emerging zoonotic threats while potentially spreading infections to others. Mapping transmission risks regionally is essential to address health concerns for humans and livestock, guiding prevention efforts in high-risk areas.

* Member of the MediLabSecure network

If you have any suggestions or information you wish to share, please let us know and send an email to the discussion list **mls.entomo-all@listes.ird.fr**.