

# MediLabSecure (WP3) – Newsletter n°29 – November 2021



Dear network members,

We are very glad to announce you that we finally have been able to co-organize a two weeks training ON SITE in Valencia, Spain! This two weeks training gathered 20 advanced student and 18 trainers / organizers from 18 countries in total. Four trainees and three trainers were from MLS countries. We were very glad to finally meet again in person.

The activity report is available here:

[https://www.medilabsecure.com/documents/site/report\\_training\\_school\\_valencia\\_2021\\_10\\_18.pdf](https://www.medilabsecure.com/documents/site/report_training_school_valencia_2021_10_18.pdf)

## NEWS FROM MLS.ENTOMO

Don't forget to save time for our next **Online Balkan and Black Sea Regional Meeting** that will take place on the **2<sup>nd</sup> and 3<sup>rd</sup> of December 2021 respectively from 1 to 3 pm (2 Dec) and 10 am to 12 pm (3 Dec), CET time**. This Regional Meeting will focus on the **“Detection of emerging zoonoses and outbreak investigation”** with an exercise based on an **encephalitis case study**.

Important note: this registration is reserved to members from Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Montenegro, Republic of North Macedonia, Serbia and Turkey.

Please kindly send an email to [lauriane.mariame@ird.fr](mailto:lauriane.mariame@ird.fr) to register.

## NEWS FROM THE REST OF THE 'MED ENTOMOL' WORLD

### ENJOY READING

[Mosquito control success, failure and expectations in the context of arbovirus expansion and emergence](#)

Isabelle Dusfour, Sarah C.Chaney

In this a quite comprehensive article, Dusfour & Chaney depict an overview of the state of the control over invasive *Aedes* mosquitoes mainly *Aedes aegypti* and *Aedes albopictus*. They remind that except for four examples of success stories implying the eradication of those species and the disease it carried,

“worldwide *Aedes* vector control efforts have not succeeded in sustainably reducing the arbovirus burden in recent decades.” According to them the reasons for this failure mainly lies in the authoritarian and top down approaches of the organization of the control activities that led to a lack of involvement of the communities affected and no sustainability of the control efforts. Another explanation lies in the type of chemicals used during those campaigns that revealed themselves, at least, not environmentally friendly and sometimes even dangerous including for mammals, and also less and less effective as mosquitoes develop resistances. Then, the authors investigate the potential future of the fight against mosquitoes that may include auto dissemination traps, large scale trapping of adults and the currently studied 3 methods of the sterile insect technique (SIT, RIDL and IIT). Eventually, they enlarge the discussion and underline the importance of also focusing on controlling transmission, and not only the populations of vectors, reminding the plasticity of *Aedes* mosquito species and the emergence of new vector species and new viruses using humans as dead-end hosts.

### [Bat capture Manual for Africa](#)

Roland Suluku, Temidayo Adeyanju, Benallal Kamel (Kamel being a MLS member)

This manual is for researchers who works with bat species to solve the challenges of emerging zoonotic diseases. It helps understanding the necessary steps to bat capturing, ethical considerations, approvals and importance of safety during fieldwork. Steps to capture bats, probable habitats and procedures involved in collecting primary data for emerging zoonotic diseases are presented. This manual also exposes basic principles and guides to investigating zoonosis from bat species with reduced exposure and risks to personnel.

### [An updated checklist of the mosquitoes \(Diptera: Culicidae\) present in Algeria, with assessments of doubtful records and problematic species](#)

B. Merabti, M. Boumaza, M.L. Ouakid, Thaddeus M. Carvajal, Ralph E. Harbach

This article presents, based on records published from 1903 to 2021, fifty-three species belonging to seven genera are known with reasonable confidence to be present in Algeria, including *Aedes* (15 species), *Anopheles* (15), *Coquillettidia* (2), *Culex* (14), *Culiseta* (5), *Orthopodomyia* (1) and *Uranotaenia* (1). Two additional species, *Culex simpsoni* Theobald, 1905 and *Uranotaenia balfouri* Theobald, 1904, are provisionally regarded as present in Algeria. Published records are listed for each species, with indication of synonymous usage and variant spelling of names where applicable. Problematic species and doubtful occurrence records are discussed. Notes on taxonomy and medical importance are provided for the more important species.

### [Emerging Mosquito-Borne Viruses linked to \*Aedes aegypti\* and \*Aedes albopictus\*: Global Status and Preventive Strategies](#)

Jonas Näslund, Clas Ahlm, Koushikul Islam, Magnus Evander, Göran Bucht and Olivia Wesula Lwande

This article is mainly a call for innovative strategies for the prevention and control of CHIKV, DENV, YFV, and ZIKV viruses. Reminding that the two invasive species *Aedes. aegypti* and *Aedes. albopictus* are both at least potential vectors of those four arboviruses, this review highlights the human threats and economic burdens that the spread of those arboviruses represent. Moreover, beside the exception of the notable YFV vaccine, it reminds that there is currently a lack of efficacious and safe human vaccines and antiviral therapy against most of the arbovirus diseases. Thus according to the authors, the surveillance should include effective prediction models and be organized to monitor at least the level of virus activity, the vector populations and the infections in vertebrate hosts and human cases.



*Aedes albopictus* ( photo Nil Rahola-IRD)



*Aedes aegypti* ( photo Nil Rahola-IRD)

#### [Co-Circulation of All Four Dengue Viruses and Zika Virus in Guerrero, Mexico, 2019](#)

Daniel Nunez-Avellaneda, Chandra Tangudu, Jacqueline Barrios-Palacios, Carlos Machain-Williams, Luz Del Carmen Alarcón-Romero, Ma Isabel Zubillaga-Guerrero, Salatiel Nunez-Avellaneda, Lauren A McKeen, Israel Canche-Aguilar, Laura Loaeza-Díaz, Bradley J Blitvich

This article provides evidence for the concurrent circulation of ZIKV and the four serotypes of DENVs in Guerrero, Mexico.

#### [Surveillance of Mosquitoes \(Diptera, Culicidae\) in Kyiv, Ukraine between 2013 and 2017](#)

Tata Romanenko, Natalyia Hunchenko, Tetiana Kharkhun, Lyudmila Kardupel, Larysa Honcharenko and Stephen Higgs

This article describes the results of a State-supported mosquito surveillance program in Kyiv, Ukraine. The surveillance identified 29 different species: 5 Anophelinae and 24 Culicinae species. Culicine mosquitoes included 17 *Aedes*, 3 *Culex*, 3 *Culiseta*, and 1 *Mansonia* species. A declining trend in the numbers of mosquitoes collected from 2013 to 2017 is observed and has several potential explanations, including increased urbanization and more effective control, but also may reflect changes in surveillance efforts.

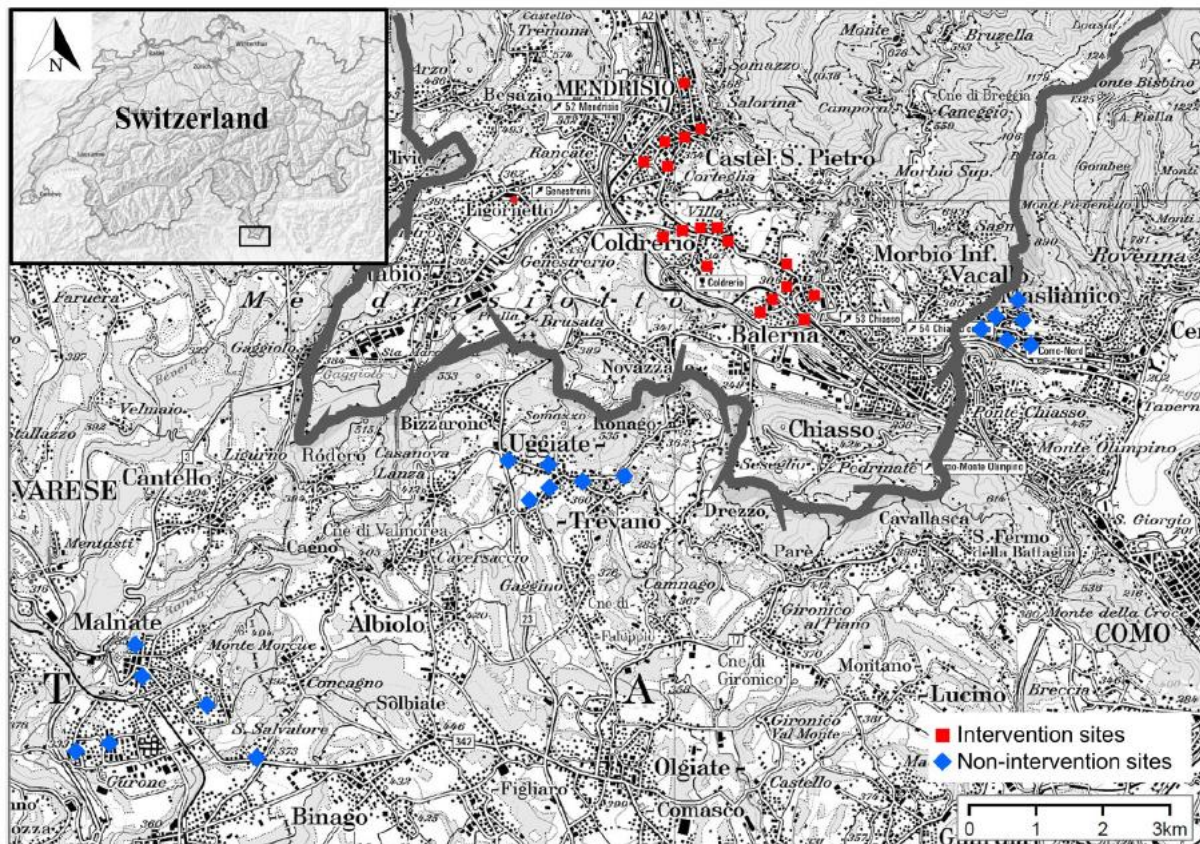
#### [Characterization and Host-Feeding Patterns of \*Culex pipiens\* s.l. Taxa in a West Nile Virus-Endemic Area in Southeastern Romania](#)

Georgiana Victorița Tiron, Ioana Georgeta Stancu, Sorin Dinu, Florian Liviu Prioteasa, Elena Fălcuță, Cornelia Svetlana Ceianu, Ani Ioana Cotar

This article studies *Culex pipiens* sensu lato in southeastern Romania where it has been documented as West Nile virus (WNV) vector. In Bucharest and the surrounding Ilfov county, which are WNV hotspots, the morphologically indistinguishable biotypes of *Culex pipiens*, namely *pipiens* and *molestus*, are both present and their involvement in WNV transmission was not previously documented for each biotype. Using real-time PCR assay based on CQ11 microsatellite, this study established a sympatric distribution of both biotypes. A preference for green areas was observed for *pipiens*, and human settings and animal farmlands for *molestus*. Thanks to this technique and the DNA barcoding of the blood-engorged mosquitoes the proportion of hybrids and the feeding preference for each of the *pipiens*, *molestus* and hybrids were established. The results confirm the role of *pipiens* biotype as enzootic/epizootic vector, and specifically show *molestus* as the bridge vector for WNV. These findings suggest that targeted mosquito control to limit WNV transmission may be possible.

## [Effectiveness of integrated \*Aedes albopictus\* management in Southern Switzerland](#)

Damiana Ravasi, Diego Parrondo Monton, Matteo Tanadini, Eleonora Flacio



**Fig. 1** The six municipalities across the Swiss-Italian border, denoted by the thick dark grey line, surveyed in 2019. The red squares and blue diamonds represent sampling sites in intervention and non-intervention areas, respectively. Map modified from <https://map.geoadmin.ch/>

This article describes the evaluation of the effectiveness of an integrated vector management (IVM) against *Aedes albopictus* implemented in southern Switzerland. The control measures focus on the aquatic phase of the mosquito with removal of breeding sites and applications of larvicides in public areas whereas private areas are reached through extensive public information campaigns. This IVM is implemented in all municipalities in southern Switzerland while in the Italian municipalities just across the Swiss-Italian border, where *Aedes albopictus* is also present but no coordinated intervention programme is in place. Thus the Italian municipalities areas serve as control. Measurements of density of mosquitoes on both sides were mainly performed via Ovitrap and adult female traps. The result is that mean numbers of *Aedes albopictus* eggs and adult females in 2019 were consistently higher in the municipalities not following an IVM programme: about four times (3.8) more eggs, than in the municipalities implementing an IVM programme. Comparison with data from 2012 and 2013 indicates that the gap between intervention and non-intervention areas may have almost doubled in the past 6 years.

[Pesticide pyriproxyfène–virus Zika : découverte d’une alliance tragique pour le développement cérébral](#)

[Common pesticide may have made the Zika epidemic worse – new research](#)

Pieter Vancamp, Barbara Demeneix

Pieter Vancamp and Babara Demeneix propose a hypothesis to explain the high prevalence of microcephaly in infants in Brazil during the Zika epidemics. It raises the question of the interactions

between the Zika virus fever epidemic in 2015 in Brazil and the concomitant use of pyriproxyfen as an insecticide in the regions of the Northeast. In these regions, the incidence of microcephaly in infants born to mothers with Zika during pregnancy was higher than elsewhere in Brazil. They have shown that pyriproxyfen disrupts thyroid hormone signaling, modifying processes crucial for the proper brain development of the fetus. The first stage of research began by demonstrating on xenopus (*Xenopus laevis*) tadpoles genetically modified and then exposed to pyriproxyfen, a blockage of the action of triiodothyronine (T3) involved in ensuring the equilibrium between the number of neurons and the number of glial cells. Besides, the authors also showed that the insecticide also tends to increase the concentration of the Musaschi 1 protein, which promotes a faster replication of the virus. They eventually, plead for pesticides to be subjected to improved testing protocols, the results of which will be used by decision-makers to support their health policies.

[First Serological Evidence of Crimean-Congo Hemorrhagic Fever Virus and Rift Valley Fever Virus in Ruminants in Tunisia](#)

Khaoula Zouaghi, Ali Bouattour, Hajer Aounallah, Rebecca Surtees, Eva Krause, Janine Michel, Aymen Mamlouk, Andreas Nitsche, Youmna M'ghirbi (**several authors being MLS members**)

This study determines seroprevalences of Crimean-Congo hemorrhagic fever virus (CCHFV) and Rift Valley fever virus (RVFV) and potential risk factors among livestock (cattle, sheep, and goats) in Tunisia. Sera were tested for antibodies against CCHFV (n = 879) and RVFV (n = 699) using various enzyme-linked immunosorbent assays (ELISAs) and indirect immunofluorescence assays (IIFA). The overall seroprevalence of IgG antibodies was 8.6% (76/879) and 2.3% (16/699) against CCHFV and RVFV, respectively. For CCHF seropositivity bioclimatic zones and breed were potential risk factors for the three tested animal species; while the season was associated with cattle and sheep seropositivity, tick infestation was associated with cattle and goats seropositivity and age as a risk factor was only associated with cattle seropositivity. Age and season were significantly associated with RVFV seropositivity in sheep. Thus, this study confirms the circulation of CCHFV and RVFV in Tunisia and identifies the principal risk factors in ruminants. This knowledge could help to mitigate the risk of ruminant infections and subsequently also human infections.

If needed, we may help to get the full pdf of these articles.

If you have any suggestions or information you wish to share, please let us know and send an email to the discussion [mls.entomo-all@listes.ird.fr](mailto:mls.entomo-all@listes.ird.fr)

Best regards,

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All the previous entomo newsletters are available on the [MediLabSecure website](#).