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Veterinary, Medical and Forensic Entomology @ IZSLER

Abstract
IZSLER is involved in National and Regional Surveillance of arthropod transmitted diseases.
These activities are only possible thanks to a One Health approach and make it possible to identify new potential pathogens in addition to those under surveillance.

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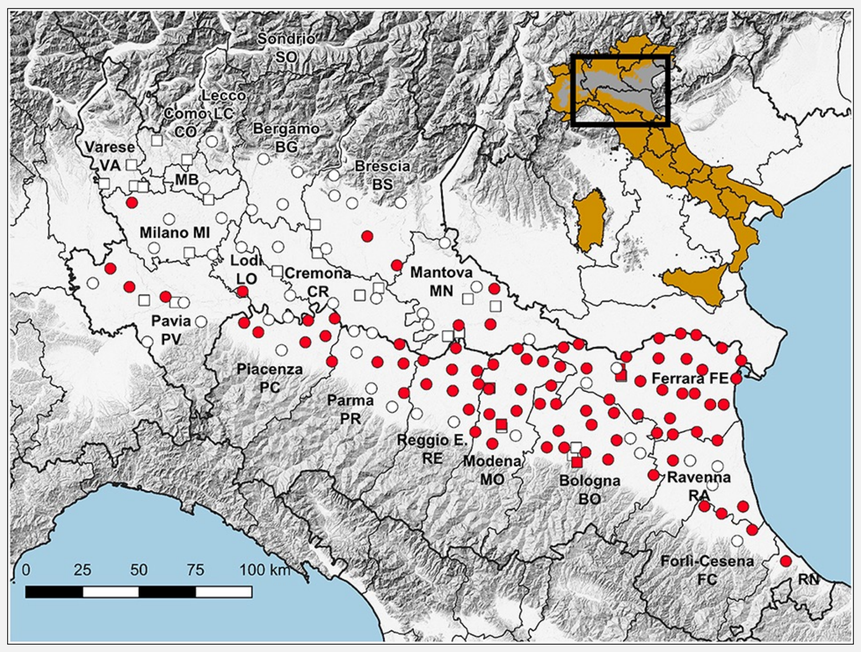
Introduction
The IZSLER boasts an activity of more than twenty years in entomology and acarology with medical-veterinary implications. In recent years IZSLER was involved in the surveillance of vector-borne diseases, dealing with regional and national surveillance of various pathogens transmitted by mosquitoes (WNV, USUV and importable mosquito borne diseases as CHIKV and DENV), sand flies (*Leishmania* and TOSV) or ticks (*Borrelia, Babesia, Rickettsia*, TBEV). The IZSLER also performs dating activities with Forensic Entomology methods.

Activities

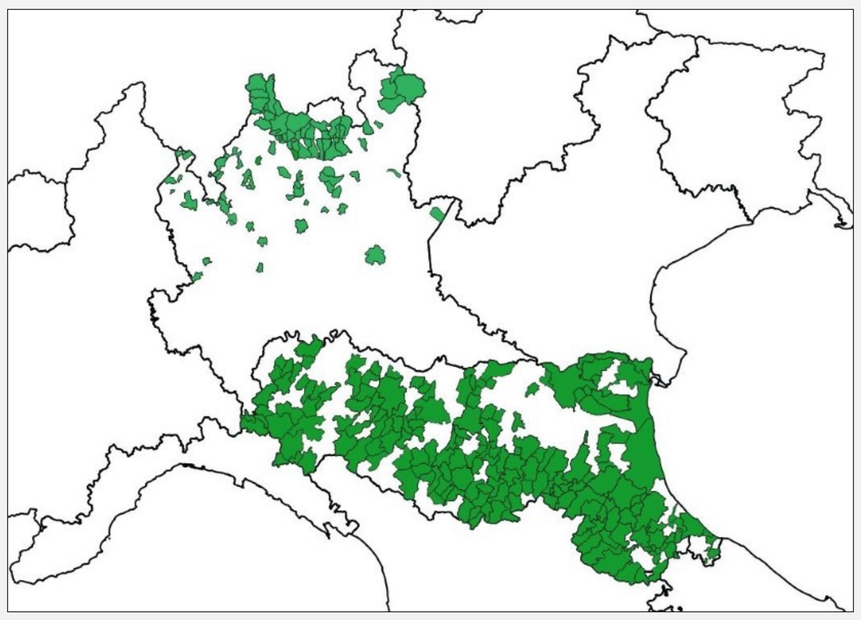
Mosquito-borne diseases
The main surveyed virus is the West Nile Virus that circulate between mosquitoes and birds and can infect human and horses as dead-end hosts. This surveillance was performed through a wide sampling effort of mosquitoes and wild birds. For example, more than 380,000 mosquitoes were collected in 2018, of which more than 270,000 were tested obtaining 232 pools WNV positive. IZSLER is also involved in surveillance of viruses possibly imported with sick travelers (as CHIKV, DENV, ZIKAV) and in detection of neglected viruses, as Tahyna virus.



Map showing the location of traps working throughout the season (circles) and for part of the season (squares), with reference to WNV detections (red), and the reference of the surveyed area on a map of Italy (from Calzolari et al. Front Vet Sci. 2020)

Sand fly-borne diseases
The IZSLER is involved in the Regional surveillance of *Leishmania* and Toscana Virus. This activity allowed the discovering of new viruses of the *Phlebovirus* genus for which pathogeny for human and animals is not jet characterized.

Tick-borne diseases
The IZSLER research and identify ticks and tick-borne diseases since 2008 thanks to integrated surveillance on wild fauna surveillance plans. To date about 10,000 ticks were identified and tested for various diseases such as Lyme disease, anaplasmosis, rickettsiosis, babesiosis, Tick-borne encephalitis, Crimean Congo Hemorrhagic fever. Furthermore, we produced guidelines and courses for tick-borne zoonoses prevention and diagnosis.



Map showing the municipalities where ticks were collected

Forensic entomology
Forensic entomology is the intersection between insect science and the legal system. Since 2010 IZSLER applies the principles of forensic entomology to sectors such as the legal veterinary and human medicine and food safety by different activities:

- providing information about the times of infestation,
- training about the potentiality of forensic entomology and its fields of application,
- performing research activity aimed to understand the eco-ethological aspects of the insect species most involved in the infestation/contamination.

Poster Download

Conclusions

Data obtained in the frame of National and Regional Plans of Surveillance provide the Health System with the fundamental data to evaluate the circulation of the searched pathogens and undertake the correct prevention actions (for example, start testing transfusions after the beginning of the WNV circulation). This is possible only by a joint effort of a multidisciplinary team (including veterinarians, entomologists, biologists, virologists, parasitologists, modellers), in the frame of a "One Health" approach.