

Combatting Mosquitoes In Belgrade Via GPS Devices And Drones



The Serbian capital's improved system to combat mosquitoes complies with European standards and follows climate change trends

DR DRAGANA DESPOT, DIRECTOR OF THE INSTITUTE FOR BIOCIDES AND MEDICAL ECOLOGY

The Institute for Biocides and Medical Ecology has been performing tasks of monitoring and combatting mosquitoes in Belgrade since 2015. The previous method of combatting mosquitoes has been improved to enable the permanent control of numbers with the mapping of habitats for mosquito larvae and adult forms via GPS devices and implementation in the GIS programme. Monitoring also encompasses invasive species of mosquitoes and the risk of imported zoonosis.

» **The Institute for Biocides and Medical Ecology took over the job of combatting mosquitoes that was previously carried out by a private company, thereby realising huge savings.**

- This type of method of working is harmonised with the requirements of European standard EN 16636 (Pest management services / Requirements and competences), and follows the trends of climate change.

The new working system was presented by eminent world experts at the 20th European

Society for Vector Ecology (E-SOVE) Conference in Lisbon from 3rd to 7th October 2016 and at the 8th EMCA (European Mosquito Control Association) Conference in Montenegro from 12th to 16th March 2017, as well as at scientific meetings in Athens and Budapest.

By localising the problem and reducing the degree of infestation, invasiveness, and risks from imported vector-borne diseases, we can control the efficiency and development of resistance to applied biocides. The rationalisation for usage of materials is aligned with environmental principles and the safety of human health. This also leads to financial savings.

In short, the system appears as follows:

In the afternoon hours specialised traps are set for mosquitoes in some 40 locations

around the territory of the city of Belgrade. The traps possess as a lure frozen SO₂ – dry ice that mimics the breathing of humans (animals) and thus entices mosquitoes, while have also their own power supply, which enables them to function autonomously for a minimum of 18 hours. The traps are collected the next morning and brought to the Institute's entomological laboratory. At the laboratory we determine the number of mosquitoes and which species are present, then samples are separated for PCR analysis to check for the presence of pathogens that are carried by mosquitoes (West Nile virus, malaria, Chikungunya virus etc.). This means that we have the results on the number of mosquitoes by around 11am, while we receive the results of PCR analysis in the afternoon hours. In this

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way it is possible for us to organise activities for that same evening to combat mosquitoes at locations that showed an increased number of mosquitoes or which tested positive for the presence of the fever-causing West Nile virus. The aforementioned activities are carried out during a period of 24 hours, while several days were previously required.

In 2017 we will use a drone to monitor mosquitoes and act directly in prevention works by applying preparations in the inaccessible areas that represent mosquito hotbeds. This is a brand new technological approach to monitoring and combatting mosquitoes that is still in its infancy in many developed countries. In addition to operations aimed at monitoring and combatting mosquitoes, the drone will also have a role in emergency situations, because the Institute has authorised and trained legal entities to deal with emergency situations (epidemics, floods etc.).

The Institute also carries out projects for the Ministry of Health on the monitoring of vector-transmitted diseases, such as West Nile virus and tick-borne encephalitis, on the entire territory of Serbia. Super analysis of samples is carried out at respected European

laboratories, such as the Istituto Sperimentale Zooprofilattico dell'Abruzzo e del Molise "Giuseppe Caporale" in Teramo, Italy. We are also in the process of establishing cooperation with the National Institute of Public Health in Prague, in the field of entomological analysis.

» **There is a lot of talk about the need to prevent infectious diseases. How much of a role does your institution play in that?**

- Our institute was founded in October 1891 with the aim of preventing infectious diseases and it forms part of the network of health institutions that operate as state-owned facilities founded by the City of Belgrade. It performs health activities at several levels of health protection in the field of preventative healthcare from infectious diseases for the population, implementing DDD measures for the prevention and control of infectious

(Medilab secure project). In addition this, we also participate in numerous international projects that relate to vectors and pathogens of vector-transmitted disease.

» **Does Serbia invest enough in the professional development of staff and the procurement of equipment for these purposes?**

- The advancement of science and technology, in light of the risks of climate change, demands professional training, innovation biocides (the Institute developed a new mosquito larvacide in 2016) and the procurement of equipment for applying biocides. Scientific and expert meetings, both at home and abroad, are attended regularly. In the last two years, the technical capacity has been increased with 35 devices for cold and warm ULV fogging, as well as 35 vehicles suitable for this purpose.

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diseases. The preventative services provided by the Institute are based on the best evidence of practice and research, as well as the highest professional and ethical standards. The Institute determines and monitors the implementation of a unified doctrine in the application of biocides in the prevention and combatting of infectious diseases, as well as implementing medical ecology programmes through risk assessments in the application of biocides.

The Institute plays a major role in preventing infectious diseases and combatting epidemics: smallpox in 1972, detecting WNV in 2012, the floods of 2014. Our experts are members of several working groups related to the prevention of infectious and vector-borne diseases in Serbia and at the regional level

» **When it comes to legislation in the field of biocides, to what extent is this area in Serbia harmonised with the EU Acquis?**

- Our legislation is harmonised with the laws and directives of the European Union. All products and preparations used by the Institute in its work are registered by the Ministry of Agriculture and Environmental Protection, and are used in European Union countries. «

