

Guidelines title [In English]

**Módszertani Levele – A Szúnyogok Elleni Védekezésről  
[Methodological letter – On the control of mosquitoes]**

Year of edition

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Summary

Objectives:

This publication summarises the epidemiological and public health significance of native mosquito species in Hungary, the framework of the legislation on defence, including some of the national acts on public health, and outlines the related tasks of the National Public Health and Medical Officer Service (ÁNTSZ) designed according to the WHO, CDC and EPA standards. This document sums up how to regulate the implementation of mosquito control organised centrally by the government, including both aerial applications of insecticides and biological control methods (to suppress mosquito larvae), and technological details as well. Furthermore, it mentions the importance of control efficiency measurement (counting bites) and elimination of mosquito breeding sites.

Although the system mentioned in this document seeks to minimise the environmental risk and restricts the use of insecticides to inhabited areas, it does not define criteria for determining the necessity of control treatments at exact territories. However, the document contains a very detailed description of the biological characteristics of the most important mosquito species, the necessity of controls still depends on the needs of local citizens only, but not on the phenology of mosquitoes. Meanwhile, the authors point out that there is an urgent need to carefully investigate larval breeding sites also and put attention on the risk of developing resistance against insecticides.

Targeted mosquito species: *Aedes vexans*, *Anopheles maculipennis s.l.*, *Culex pipiens form molestus*, *Coquillettidia richiardii*.

Methods:

- Surveillance methods: Before applying any chemical treatment of an area, checkpoints should be marked, at least 1 point/200ha and 100m apart. These checkpoints must be visited in the same hours (5-8 AM or 6-9 PM) by the same person, by collecting mosquitoes (with mouth aspirator) for 5-15 minutes in case of adult mosquitoes. The collected mosquitoes should be counted, identified, and relevant field data should be noted. An indicator of relevant mosquito density is 20-30 mosquitoes/hour/person.  
In the case of larvae control, before the treatment checkpoints by a range of 20-50 meters from each other should be chosen, where larvae are present in high numbers. The larvae should be collected with a net, the density of larvae should be calculated using a formula, and stored labelled.  
The density of adults and/or larvae must be checked after the treatment as well to assess the efficiency of the treatment.
- Risk level ranking: not specified.
- Period of activation: all year long.
- Other: Control methods focus primarily on the reduction of the adult population (eliminating the already hatched individuals) using insecticides (deltamethrin-, dichlorvos-, or permethrin-based) (98%), and partially on suppression of larvae using larvicides (2%) as a preventive method.

Audience: public health officers, entomologists.

Scale (national/local): national.

Technical annexes: For treating adults, insecticides are dispersed by cold-, thermal- and ULV fogging techniques.

Specificities:

Approved ULV-preparations: AQUA RESILIN SUPER, K-OTHRIN 10, MOSQUITOX 1, MOSQUITOX 1 forte, UNITOX.

Compounds used for thermal fog: UNITOX, RESILIN premium

Compounds used in larvicide treatments: TEKNAR HP-D, VECTOBAC 12AS, VECTOBAC G\*CG, MOSQUITOX-XQ-1, VECTOBAC TP, BIOPREN-BM 20 EC, BIOPREN-BM 5 GR

Aircrafts and ULV nozzles used in mosquito control:

Type of aircraft	Type of nozzle and quantity	
<b>Fixed-wing aircraft</b>		
AN-2	Micronair or Autorot X-20	4-8
M18 Dromader		
Piper PA 25-235 (Pawnee)		
Piper PA 36-300 (Brave)		
Turbo Čmelak Z 137 T		
Turbo Čmelak Z 137 A		
Čessna 188		
Shadow-BD (Corp-Spray spray equipment)	Micronair X-1:VP	12
<b>Helicopter</b>		
KA-26	Beecomist-275	6
MI-2	(With a 40/60 micrometre drum)	6
Hughes MD 500	or	
Rogerson-Hiller UH 12	Unirot-4 (With 30 micrometre drum)	
<b>Glider</b>		
Apollo CX Tandem-R (with defensor ULV sprayer adapter)	Maser 84	10