

# WORLD HEALTH ORGANISATION TEST APPLIED ON *CULICOIDES*: A MULTICENTRIC STUDY

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■ VECTOR SURVEILLANCE

The aim of this work is to organize a multicentric assay to compare susceptibilities of *Culicoides* populations to insecticides (i.e. *C. imicola* and *C. obsoletus sensu stricto*). The base line of the World Health Organisation test kit (WHO/VBC81.805) is to expose mosquitoes to papers impregnated with insecticides to detect the resistance of *Anopheles* (paludism vector) in the field. In a novel approach, the WHO test can be used on *Culicoides* to assess midges' susceptibility to insecticides. Information on the intrinsic susceptibilities to insecticides is required to assess correctly the existing (or new) formulations of insecticide. This multicentric assay will improve our capacity to experiment by networking and assess the population variability by comparing susceptibilities between different populations of *Culicoides*.

Field-collected midges are trapped alive using an ultraviolet light trap (OVI model, South Africa) and replacing the collection jar with a fine mesh cage. To prevent desiccation, cages are covered with wet papers, wrapped in aluminium foil and retrieved at dawn. It is important to choose the site and period with abundant target species to improve robustness with more individuals. Experiments should be carried out in an insecticide-free environment with constant temperature and humidity, and started a few

hours after collection. Insecticide-impregnated papers are rolled and fastened into the WHO kit test tube. About 30 *Culicoides* (approximately 20 nulliparous females) are collected and transferred to the tube. Tubes are maintained horizontally for an hour (exposure to insecticide). Mortalities are recorded 1 h and 24 h after exposure. One control is performed without insecticide to validate the test. Mortalities are analysed by probit regression to obtain LC<sub>50</sub> and LC<sub>90</sub> for each population. The test has to be run at least with four concentrations of insecticide, one control and four replicates with samples from the same population. Only nulliparous females are recorded. Insecticide concentrations are given in percentages (WHO standard). In this WHO test, the target species are *C. imicola* and *C. obsoletus s.s.*, and the active ingredient used is deltamethrin at doses 0.005, 0.001, 0.0005 and 0.0001%. Data will be centralized and analysed by EID-Méditerranée (France), and results will be given back to the partners and published. Future studies could focus on comparing the four deltamethrin concentrations on other species and testing *Culicoides* susceptibility to other components.

**KEYWORDS:** *CULICOIDES* – DELTAMETHRIN.

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