



# **GUIDELINES FOR EFFICACY TESTING OF MOSQUITO REPELLENTS FOR HUMAN SKIN**



**CONTROL OF NEGLECTED TROPICAL DISEASES  
WHO PESTICIDE EVALUATION SCHEME**

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The first draft of the guidelines was subsequently peer reviewed by individuals and institutions known for their expertise in the subject.

The above-mentioned drafting committee considered all comments and prepared a second draft. This revised draft was reviewed and discussed at the WHOPES consultation held at WHO headquarters in Geneva, Switzerland on 23–27 February 2009. Representatives from industry were invited to attend the first one-and-a-half-days of the meeting for the purposes of exchanging information and sharing views, after which the second draft and comments were further reviewed by a group of WHO-appointed experts, who finalized the guidelines by consensus. These experts were Dr Jane Bonds, Florida A&M University, Panama City, FL, USA; Dr Don Barnard, Mosquito and Fly Research Unit, United States Department of Agriculture, Gainesville, FL, USA; Dr Ulrich Bernier, Mosquito and Fly Research Unit, United States Department of Agriculture, Gainesville, FL, USA; Dr Gary Clark, Mosquito and Fly Research Unit, United States Department of Agriculture, Gainesville, FL, USA; Dr Vincent Corbel, Centre de Recherches Entomologiques, Cotonou, Benin; Dr David Dame, Gainesville, FL, USA; Dr Nigel Hill, London School of Hygiene and Tropical Medicine, London, UK; Dr Zairi Jaal, Universiti Sains Malaysia, Penang, Malaysia; Mr Christophe Lagneau, EID Méditerranée, Montpellier, France; Mr Mark Latham, Manatee County Mosquito Control, Palmetto, FL, USA; Dr Lee Han Lim, Institute for Medical Research, Kuala Lumpur, Malaysia; Professor Dr

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The Department greatly appreciates feedback and suggestions from national programmes, research institutions and industry on the guidelines in order to improve future editions.

## 1. INTRODUCTION

The purpose of these guidelines is to provide specific and standardized procedures and criteria for efficacy testing and evaluation of mosquito repellents for human skin. Their aim is to harmonize the testing procedures carried out in different laboratories and institutions in order to generate comparable data for registering and labelling such products by the national regulatory authorities. However, the requirements for registration of pesticides, including repellents, are determined by the national regulatory authorities.

These guidelines are an expanded and updated version of those recommended by the WHO Pesticide Evaluation Scheme (WHOPES) Informal Consultation on the evaluation and testing of insecticides, held at WHO headquarters in Geneva, Switzerland, on 7–11 October 1996 (1). These were reviewed and recommended by the WHO Consultation on testing and evaluation of public health pesticides, held at WHO headquarters on 23–27 February 2009.

The guidelines provide guidance and procedures on laboratory studies, field trials and evaluation of technical material used in mosquito repellent products and on the methods used to determine their application rate(s) and effectiveness. Guidance is also provided on the single-dose evaluation of formulated repellent products. With some modification, the guidelines can be used to determine the repellency of candidate compounds for other flying insects that blood-feed on humans.

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