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REPORT OF THE NINTH WHOPES WORKING GROUP MEETING

WHO/HQ, GENEVA
5–9 DECEMBER 2005

Review of:
DIMILIN® GR AND DT
VECTOBAC® DT
AQUA K-OTHRINE®
AQUA RESLIN SUPER®

World Health Organization

CONTROL OF NEGLECTED TROPICAL DISEASES
WHO PESTICIDE EVALUATION SCHEME

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1. INTRODUCTION

The ninth meeting of the WHOPES Working Group, an advisory group to the WHO Pesticide Evaluation Scheme (WHOPES), was convened at WHO headquarters in Geneva, Switzerland, on 5–9 December 2005. The objective of the meeting was to review the reports of testing and evaluation of Dimilin® (diflubenzuron) 2% GR and 2% DT (Crompton, Netherlands) and VectoBac® (*Bacillus thuringiensis israelensis*) DT, 3000 international toxic units (ITU)/mg (Valent BioSciences, USA) for mosquito larviciding; and Aqua K-Othrin® (deltamethrin) 2% w/w EW and Aqua Reslin Super EW (= Aqua Resigen; containing permethrin 25/75 cis/trans (10.35% w/w), s-bioallethrin (0.14% w/w) and piperonyl butoxide (9.85% w/w) (Bayer Environmental Science, France)) for space spraying for mosquito and fly control.

The meeting was opened by Dr Lorenzo Savioli, Director, Department of Control of Neglected Tropical Diseases. In his opening remarks he referred to the new name and departmental structure. Dr Savioli stated that the neglected tropical diseases, which include sleeping sickness, schistosomiasis, river blindness, hookworm, elephantiasis, dengue and blinding trachoma, affect several hundred million people and kill at least half a million annually, yet they receive little attention from donors, policy-makers and public health officials. He added that for costs that are relatively modest compared with those needed to control "the big three" – HIV/AIDS, tuberculosis and malaria – an integrated package for control of neglected tropical diseases could have a proportionately greater impact on the health of more poor people and be more equitable for the majority of the poorest and marginalized communities. Dr Savioli noted the importance of vector control as an essential cross-cutting activity for the control of vector-borne diseases.

Dr Michael Nathan, Team Leader, Vector Ecology and Management, reminded the meeting of the WHO *Global strategic framework for integrated vector management* (IVM)[1], which provides the guiding principles for assisting Member States in controlling vector-borne diseases. He informed the meeting of the WHO Bulletin (2005) policy and practice article *Exploiting the potential of vector control for disease prevention*[2] and commented that the development of guidelines for planning, implementation and monitoring of IVM activities and supporting Member States in vector control capacity strengthening would be priority activities of the Vector Ecology and Management team in the coming years.

Dr Morteza Zaim, Scientist in charge of the WHO Pesticide Evaluation Scheme (WHOPES), presented the objectives and an overview of the scheme to the participants. He noted that the recommendations of WHOPES on the use of public health pesticides are to facilitate the registration of such products by Member States. He also indicated that the reports of the WHOPES Working Group meetings are well received by national registration authorities and control programmes as an excellent source of information and consolidation of available information on pesticides evaluated by WHOPES and that every effort will be made to make the reports more useful and widely available.

Dr Zaim also noted that WHOPES is a four-phase programme and that the development of specifications constitutes the last phase of the scheme. He emphasized that WHO recommendations on the use

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[1] *Global strategic framework for integrated vector management*. Geneva, World Health Organization, 2004 (WHO/CDS/CPE/PVC/2004.10).

[2] Townson H, Nathan MB, Zaim M, Guillet P, Manga L, Bos R, Kindhauser M. Exploiting the potential of vector control for disease prevention. *Bulletin of the World Health Organization*, 2005, 83:942–947.

of public health pesticides are valid ONLY if linked to WHO specifications for their quality control.

The meeting was attended by 12 scientists (see Annex 1: List of participants). Dr Mir Mulla was appointed as Chairman and Dr Purushothaman Jambulingam as Rapporteur. The meeting was convened in plenary and group sessions, in which the reports of the WHOPES supervised trials and relevant published literature (see Annex 2: References) were reviewed and discussed. Recommendations on the use of the above-mentioned products were made.

The group also reviewed and revised the draft guidelines for testing mosquito adulticides for indoor residual spraying and for treatment of nets, to be published as a separate document by WHOPES.

2. REVIEW OF DIMILIN 2% GR AND 2% DT

2.1 Safety assessment

Dimilin® (diflubenzuron) is an insect growth regulator (IGR) of the benzoyl urea family [1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl) urea] that acts by disrupting chitin synthesis and deposition. The toxicity of diflubenzuron was evaluated by the FAO/WHO Joint Meeting on Pesticide Residues (JMPR) in 1981, 1984, 1985 and 2001 (JMPR, 2001).

WHO has classified diflubenzuron as "unlikely to present an acute hazard in normal use". Diflubenzuron (purity 99.6%) has very low acute toxicity when given by various routes (oral, dermal and inhalation). Diflubenzuron had little toxicity in rats exposed dermally, with an LD_{50} of >10 000 mg/kg bw, or by inhalation, with an LC_{50} >2.8 mg/litre of air. Only marginal increases (less than doubling) in methaemoglobin concentrations were seen in mice and rats given 10 000 mg/kg bw of a formulation of diflubenzuron, equivalent to 2500 mg/kg bw, which is above the limit doses used in toxicological tests. Diflubenzuron did not significantly irritate the skin or eyes of rabbits and did not irritate the skin of guinea-pigs exposed in a Magnusson and Kligman "maximization" study. Diflubenzuron was not a skin sensitizer.

Studies in rats showed that excretion was relatively rapid, >90% of the doses of 5 and 100 mg/kg bw being excreted within 24 hours.