Impact of Indoor Residual-Sprayed Deltamethrin on Different Surfaces in a Malaria Endemic Area in Balai Ringin, Sarawak

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Abstract

Malaria control programme utilizing indoor residual spraying of chemical insecticide is only effective if a high coverage of targeted area is achieved. The effectiveness of the residual spraying, on the other hand, relies on the efficacy and residual activity of the insecticides applied, which to a certain extent are influenced by the nature of the sprayed surfaces. The bioefficacy of indoor residual-sprayed deltamethrin wettable granule (WG) formulation for the control of malaria was compared with the current dose of deltamethrin wettable powder (WP) in malaria endemic areas in Balai Ringin, Sarawak. Doses of 20 mg/m² WP (control), 20 mg/m² WG, 30 mg/m² WG and 40 mg/m² WG were sprayed separately on different surfaces namely, wooden, rough-bamboo, smooth-bamboo and brick surfaces. Residual activity of WP and WG formulations was tested against lab-bred Anopheles maculatus using WHO standard procedure. Deltamethrin at 30 mg/m² WG exhibited the highest sustainable level of effectiveness against An. maculatus (An. maculatus mortality was between 95% - 100%) up to week 60 post-spraying when sprayed on smooth-bamboo surface. These results indicated that 30 mg/m² WG could be an ideal concentration for controlling malaria vector effectively up to 15 months of which long-lasting residual spraying was envisaged. The usual two spraying cycles per year with 20 mg/m² deltamethrin WP could be replaced with 30 mg/m² deltamethrin WG since the long residual activity was achieved by employing a single spraying only.

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