

NEW DEPLOYMENT OF TRANSLUTHRIN EFFECTS INTO A LONG LASTING INSECTICIDE PAINT FORMULATION WITH DUAL ACTION RESULTS OF LABORATORY EFFICACY STUDIES AGAINST DISEASE VECTORS

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Abstract Transfluthrin is a volatile pyrethroid based on polyfluorinated benzyl alcohol that is commonly present in household insecticides like coils, electric vaporizers or aerosols used mainly against mosquitoes. Deployed into the air Transfluthrin exerts short-term effects. Due to its molecular structure, pyrethroid resistance breaking properties have been discussed for this active ingredient. Transfluthrin has not been used yet in products that offer long-lasting efficacy. Insecticide paints developed by Inesfly Corporation have shown long residual activity with active ingredients of distinct chemical classes, including pyrethroids, organophosphates, carbamates and IGRs. By using the Inesfly paint technology we formulated a Transfluthrin paint prototype exploiting the benefits of the active ingredient and the properties of the paint technology. VESTA paint (Transfluthrin 0.5%) was tested in the laboratory for contact activity in cone bio-assays (30 minutes exposure) according to WHO guidelines. For testing vapor-phase effects, the cones were placed at a distance of 5 cm from the painted surface and mosquitoes were exposed only to the vapours released from the paint layer. Knock down was recorded 1 hour and mortality 24 hours after exposure. In the laboratory contact and vapour phase cone bioassays 100% KD and mortality was obtained up to 22 months with *Aedes albopictus* and *Phlebotomus papatasi* when exposed to wooden boards at the painting rate of 8 m²/L, while *Culex pipiens* showed a delayed mortality of 63% at 24 hours. *Aedes albopictus* exposed to materials aged outdoors for 12 months, was largely killed by contact (83%) but no significant airborne effect was found. Excellent 97% KD (1h) and 100% mortality (24h) was observed with wild *Anopheles gambiae* exposed in the laboratory to primed cement surfaces aged for 6 months. The results of the laboratory experiments suggest that the Inesfly paint technology transforms the short acting Transfluthrin into a long-lasting formulation with dual action.

Key words Transfluthrin, paint, mosquito, sandfly, contact.