

**Laboratory and field preliminary tests of *Metarhizium anisopliae* formulated with neem oil (Suneem) against *Anopheles gambiae* sl adult emergence**

**Authors: SEYE F.<sup>1, 2</sup>, NDIONE R. D.<sup>1</sup>, TOURÉ M.<sup>1</sup>, BOUKRAA S.<sup>2</sup>, BAWIN T.<sup>2</sup> ZIMMERJ-Y<sup>2</sup>. NDIAYE M.<sup>1</sup>, FRANCIS F.<sup>2</sup>**

**1-** U.E.R.BV, Laboratory of Reproductive Biology, Department of Animal Biology, Faculty of Science and Technology, University Cheikh Anta Diop of Dakar, PO Box 5005, Dakar Fann, Senegal

**2-** Department of functional and evolutionary Entomology, Gembloux Agro-Bio Tech, University of Liege, Passage des Déportés 2, B-5030 Gembloux, Belgium

**ABSTRACT:**

*Metarhizium anisopliae* have shown great potential for the control of malaria vectors. However, their ability to control aquatic stages of anopheline vectors with conidial formulation is need. In laboratory condition (25°C and 76%RH), we formulated *M. anisopliae* with emulsifian neem oil (Suneem 1%) before application on *An. gambiae* larvae at 4, 6, 8, 10 and 12 % (v/v) to determine the LD<sub>90</sub>. We applied in semi-field environment, the LD<sub>90</sub> of the formulation into artificial vats on the *Anopheles gambiae* sl larvae collected from many breeding sites at dry and rain seasons.

In laboratory condition, the LD<sub>50</sub> was  $4.4 \times 10^6$  spores/ml and the LD<sub>90</sub> was not obtained 24 after exposure. The probite line equation was  $Y=1.61 x - 0.55$  and  $R^2= 0.9793$ . The LD<sub>50</sub> was  $3.1 \times 10^6$  and the LD<sub>90</sub> was  $5.3 \times 10^6$  spores/ml 48 h after exposure. The probite line equation was then  $Y= 1.69 x + 1.79$  and  $R^2= 0.9757$ . Microscope magnifying revealed also the fungal attack via cuticle and mycelia germination one dead larvae and pupae.

In semi-field environment, treatment revealed that, at  $5.3 \times 10^6$  spores/ml, the formulation has a great emergence inhibition of mosquito adult formation. No significant difference was observed between dry and rain season application of *M. anisopliae* on the larvae. Therefore, a combination of *M. anisopliae* with Suneem may provide a more sustainable management strategy for malaria vectors control at the larval stages.

**Keywords: *Metarhizium anisopliae*, *Anopheles gambiae*, biological control**