



EFFECT OF OXIDANT PULSES IN *Metarhizium anisopliae* CULTURES: CONIDIAL PRODUCTION AND INFECTIVITY

Nohemí García^{1*}; Saúl Tlecuil²; Ernesto Favela¹; Octavio Loera¹

¹ Universidad Autónoma Metropolitana-Iztapalapa, Depto. Biotecnología. CP 09340, México, D.F.

² Universidad Politécnica de Tlaxcala, C.P. 90180, México, Tlaxcala

*Email: nohemi_gar.o@hotmail.com

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Introduction. The entomopathogenic fungus *Metarhizium anisopliae* is considered an alternative for the control of agricultural pests. Air pulses enriched with O₂ applied from 60h, increase up to 100% the production of conidia, with respect to the normal atmosphere (NA, 21%) [1, 2]. Previous study showed that O₂ > 30% has not effect on the growth of filamentous fungi [3]. The objective of this study was to determine the effect of pulses of O₂ above 30% on the production of conidia by *M. anisopliae* and the corresponding infectivity.

Methods. The study was conducted with *Metarhizium anisopliae* CP-OAX, using serological bottles with oat-peptone medium [1]. Cotton plugs on bottles were replaced at 60 h with rubber stoppers. The atmosphere was changed every 24 h with O₂ at 30, 35 or 40%. Conidia yield was reported per square centimeter [1]. Infectivity was tested with *Tenebrio molitor* adults, infected by immersion (3s) in a conidia suspension. At the end of the bioassay, estimation were achieved for these parameters: time for death on set (t_0 , d), time for 50% mortality (LT₅₀, d), specific death rate (k , d⁻¹), and asymptotic survival (S , %), all were determined from data fit to the model:

$$Y = (100 - S)e^{-k(t-t_0)} + S \quad [4].$$

Results. The yield of conidia after 132 h improved 1.3 fold (Tukey: P < 0.05) with O₂ pulses at 30%, compared with the NA (Fig 1), this is consistent with previous studies [1, 2]. As O₂ concentration increased, the yield of conidia was not significantly different from that obtained with 21% O₂ (Tukey: P > 0.05), which shows that *M. anisopliae* CP-OAX tolerates higher concentrations of O₂ than previous reports [1].

Infectivity studies with *T. molitor* showed that, although the conidia were produced in lesser amount, compared to the results with 30% O₂, these have the same infectivity (Table 1), since infectivity parameters such as TL₅₀, k , S and t_0 were not significantly different (Tukey: P > 0.05).

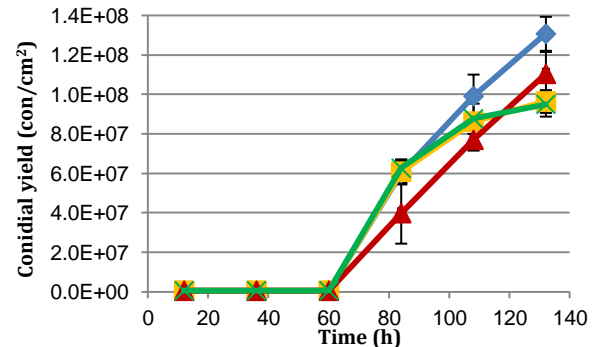


Fig.1 Conidia production kinetics with pulses of 21% (x), 30% (◇), 35% (□) and 40% (△) of oxygen in the atmosphere of the culture of *M. anisopliae*.

Table 1. Parameters of infectivity to adult *Tenebrio molitor*. Not found significant difference between treatments (Tukey, p > 0.05)

Treatment (%O ₂)				
Parameter	21%	30%	35%	40%
S (%)	0	0	0	0
t₀ (d)	2.46	2.44	3.04	3.0
K (d⁻¹)	1.78	1.82	1.13	1.38
TL₅₀ (d)	4.13	3.79	4.56	4.32

Conclusions. Oxidant pulses favored conidiation by *M. anisopliae*. Maximal yields were obtained with 30% O₂. The tolerance to higher oxidizing conditions could be advantageous in the design of production systems to accelerate conidiation, since infectivity towards *T. molitor* adult was not affected.

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