



OXYGEN-RICH PULSES IN *Isaria fumosorosea* CULTURES ENHANCE GERMINATION AND OSMOTIC STRESS RESISTANCE OF CONIDIA

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Introduction. *Isaria fumosorosea* is an entomopathogenic, mesophilic fungus (Ascomycota) with a worldwide distribution and the ability to infect a wide range of insects (1). The infective units are the conidia, however in most cases, the quality and the capacity of the conidia to resist abiotic factors have not been considered in the selection of these bio-control agents. Oxidant moderate stress has been studied in *Beauveria bassiana* (2) and *Metarhizium anisopliae* (3). Catalases are part of the antioxidant response in these fungi, and also have a role in the germination rate in conidia, improving infectivity against insects (4).

The objective of this study was to determine the effects of oxygen-rich pulses on the germination rate in conidia, resistance to osmotic stress and expression of catalases.

Methods. Studies were done with *Isaria fumosorosea* strain CNRCB1. All tests were realized with freshly harvested conidia (after 156 h of culture) exposed to normal atmosphere (21% O₂) and oxygen-rich pulses (26% O₂) (3). For the germination test (G), approximately 5000 conidia properly diluted were added to Petri dishes (three per treatment) containing Sabouraud Dextrose Agar incubated at 28°C. This test was also performed for the same medium containing 0.5 M NaCl (osmotic stress test, aw=0.975). At each sampling time (6, 8 and 10 h), an aleatory section of agar was cut, placed on a sterile slide and at least 100 conidia were counted using a microscope. Catalase activity was measured as reported previously (2).

Results. Conidia produced in a rich-oxygen atmosphere had a significantly (t student P<0.05) higher G, even under osmotic stress (OS), compared with conidia obtained in a normal atmosphere (Table 1). Significantly higher catalase activity (t student P<0.05) was detected also in conidia exposed to a rich-oxygen pulses (Fig. 1). The reduction in germination time of conidia and the increase in his infectivity against insects plague have been related to a higher catalase activity (4).

Table 1. Germination (G) and germination under osmotic stress (OS) of *Isaria fumosorosea* CNRCB1 conidia obtained under normal (21% O₂) and oxygen-rich atmosphere (26% O₂).

% O ₂	Time (h)	G (%)	OS (%)
21	6	0	0
	8	16±0.7	0
	10	51±0.6	13±0.4
26	6	19±0.6	0
	8	89±1.1	64±1.0
	10	99±0.7	86±1.7

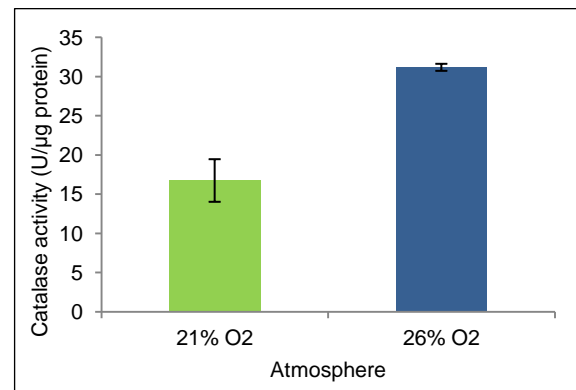


Fig.1 Catalase activity of conidia of *Isaria fumosorosea* grown under 21% O₂ and 26% O₂

Conclusions. An oxygen-rich atmosphere induced an increase in germination of conidia of *I. fumosorosea*, even under osmotic stress. This could be explained by higher catalase activity, supported by similar reports (4).

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