



## CONIDIA PRODUCTION OF ENTOMOPATHOGENIC FUNGUS IN SOLID STATE FERMENTATION.

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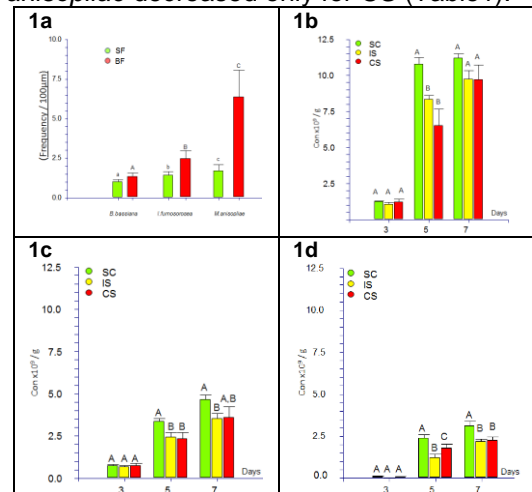
**Key words:** Entomopathogenic fungus, solid state fermentation, agitated culture.

**Introduction.** Conidia of entomopathogenic fungi (EF) are used in biological control, for the management and control of plagues [1]. Conidia are produced by solid state fermentation (SSF) using static reactors mainly [5], although in some cases agitation could be advantageous [2, 3]. The objective of this work was to study the effect of agitation on conidia quality and production.

**Methods.** Branching frequency (BF) and septa frequency (SF) were measured for the EF *Beauveria bassiana*, *Isaria fumosorosea* and *Metarhizium anisopliae* [4]. Conidia production kinetics were performed during 7 days (27±1°C) using SSF on rice and oat (1:1), inoculated with 1x10<sup>6</sup> conidia/per gram of initial dry matter (con/g). Three levels of agitation were tested: static culture (SC), intermittent stirring (IS) (2 minutes at 300 rpm every 24 h) and continuous stirring (CS) (300 rpm). Hydrophobicity (% phase exclusion) [6] and viability % in plate count [4] were performed. Data were analyzed using ANOVA and Tukey-Kramer (multiple comparison), with ( $\alpha = 0.05$ ) in both cases.

**Results.** Both BF and SF showed differences among the three strains. *Metarhizium anisopliae* presented the highest values for BF and SF (Fig 1a). For the day 7, production decreasing in IS and CS except for *B. bassiana* (Fig. 1b, 1c and 1d and table1), respect to SC.

Hydrophobicity for *B. bassiana* at day 7 not presented differences; for *M. anisopliae* and *I. fumosorosea* reductions are in IS; while CS increased value in both (Table1). Viability at day 7 for *B. bassiana* not presented differences, while decreasing values for *I. fumosorosea* for IS and CS; and *M. anisopliae* decreased only for CS (Table1).



**Fig1.** Branching and Septa Frequencies (a). Conidia production in SSF by three EF (b, c and d) using different levels of agitation. Letter indicated different mean groups.

**Conclusions.** Frequency of branching and septa not enhance resistance to the stirring conditions, these conditions affect the conidial production for *I. fumosorosea* and *M. anisopliae* in SSF, also continuous stirring increased the values of hydrophobicity, and this condition affect the viability markedly for *I. fumosorosea*.

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Strain	Stirring condition	Conidia Production	Hydrophobicity	Viability
Bb.	SC	100 <sup>A</sup>	100 <sup>A</sup>	100 <sup>A</sup>
	IS	87 <sup>A</sup>	105 <sup>A</sup>	99 <sup>A</sup>
	CS	86 <sup>A</sup>	107 <sup>A</sup>	99 <sup>A</sup>
If.	SC	100 <sup>A</sup>	100 <sup>A</sup>	100 <sup>A</sup>
	IS	75 <sup>B</sup>	56 <sup>B</sup>	80 <sup>B</sup>
	CS	77 <sup>A,B</sup>	107 <sup>A</sup>	55 <sup>C</sup>
Ma.	SC	100 <sup>A</sup>	100 <sup>A</sup>	100 <sup>A</sup>
	IS	70 <sup>B</sup>	75 <sup>B</sup>	98 <sup>AB</sup>
	CS	73 <sup>B</sup>	117 <sup>C</sup>	93 <sup>B</sup>

**Table1.** Effect of stirring on conidia production, hydrophobicity and viability of conidia. Data are relative values respect to static culture at 7 d. Same letter indicates no significant differences. Bb: *Beauveria bassiana*, If: *I. fumosorosea*; Ma: *M. anisopliae*.