



GROWTH OF *Thermomyces lanuginosus* ON SURFACE CULTURE

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Introduction. *Thermomyces lanuginosus* is a thermophile fungi growing at temperatures from 20 °C to 55 °C (1). An important characteristic of this fungus is that their enzymes are more stable at high temperatures than enzymes produced by mesophiles microorganisms (2). *T. lanuginosus* produces many degradative enzymes including amylases, xylanases and lipases (3). Mycelia growth on surface culture is among the first steps for inocula propagation. However, mycelium growth and characteristics are strongly dependent on the culture medium. Therefore, the aim of this study was to evaluate the effect of the culture medium composition on the radial growth rate and biomass production of *T. lanuginosus* on surface culture.

Methods. Dextrose and Sabouraud agar, YPD, PDA, and PDA with yeast extract and Czapek dox were used to select the culture medium of *T. lanuginosus* as pre-inoculum for SSF. *T. lanuginosus* was grown in Petri dishes, by placing in the center 1 cm² of mycelium agar and incubated for 7 days at 45 °C. In the same way, it was grown on a cellophane membrane that was placed on the agar. Radial growth rate, growth density and mycelium disaggregation (using a vortex and a dismembrator) in each culture medium were evaluated. Obtained results were evaluated statistically using ANOVA and Friedman test.

Results. Table 1 summarizes the results of radial growth rate and growth density of *T. lanuginosus* obtained in each one of the mediums analyzed.

Table 1. Radial growth rate and growth density of *Thermomyces lanuginosus* on different culture mediums (45°C).

Culture Medium	Without cellophane membrane		With cellophane membrane	
	Radial growth rate (cm/day)	Growth density (mg/cm ²)	Radial growth rate (cm/day)	Growth density (mg/cm ²)
Dextrose and Sabouraud agar	0.6 ± 0.004	1.1 ± 0.095	0.6 ± 0.008	2.5 ± 0.160
YPD	0.8 ± 0.010	4.1 ± 0.017	0.6 ± 0.001	1.9 ± 0.200
PDA	0.6 ± 0.063	2.0 ± 0.033	0.5 ± 0.000	1.4 ± 0.020
PDA with yeast extract	0.6 ± 0.002	1.9 ± 0.041	0.7 ± 0.002	1.9 ± 0.190
Czapek dox	0.7 ± 0.005	0.7 ± 0.070	0.4 ± 0.001	0.3 ± 0.090

Highest radial growth rate and growth density were obtained with YPD medium without cellophane. Use of cellophane did not have any effect on those variables excepting on Sabouraud medium where the growth density was higher in presence of cellophane. Mycelium disaggregation was achieved by vortexing for two min in presence of glass beads. Three zones of the surface culture (center, middle and periphery of dish Petri) with and without cellophane were evaluated.

Table 2. Analysis of results on disaggregation level of *T. lanuginosus* mycelium using vortex without cellophane membrane.

SourceTerm	DF	F-Ratio	Prob Level	Power (Alpha=0.05)
A: Medium	5	3.34	0.031673*	0.757109
B: Age	2	0.1	0.903614	0.06285
AB	10	0.07	0.999886	0.063977

* Term significant at alpha = 0.05

Table 2 shows that medium composition is significant with a probability value less than 0.05 affecting the level of disaggregation. Mycelia growth on dextrose and Sabouraud agar presented the highest level of disaggregation. Culture age was not statistically significant.

Conclusions. Highest radial growth rate and growth density of *T. lanuginosus* were obtained with YPD medium. Use of cellophane had a negative effect on growth density. The highest level of mycelium disaggregation was obtained with dextrose and Sabouraud agar. Mycelia disaggregation is statistically dependent on culture media composition but not on the mycelium age.

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