CULTIVATION OF TRAMETES SP. ON AGARIFIED PECTIN-CONTAINING MEDIA

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Abstract

This study examines the growth of Trametes strains on nutrient media with and without pectin, revealing significant differences. While both strains grew rapidly on standard media, T. hirsutus 1569 exhibited slower growth on pectin-enriched media compared to T. versicolor 1689. These findings suggest T. versicolor 1689 as a promising candidate for further investigation into its potential for pectinase synthesis.

Key words: *Trametes, cultivation, pectin, agar medium, radial growth rate.*

Introduction. Basidiomycetes of the genus *Trametes* are among the most studied representatives of this group of fungi [1]. This is due to their therapeutic and prophylactic properties and high activity of enzymes, including pectinases [2]. Pectinases degrade the substrate by depolymerising or deesterifying it. These enzymes are often used in the wine and brewing industry [3]. Since pectin is an inducer of pectolytic enzymes synthesis, its addition to the nutrient media will affect the growth of macromycetes [4]. The aim of the study was to screen the representatives of the genus *Trametes* for the growth rate in surface culture on agarified nutrient media containing pectin.

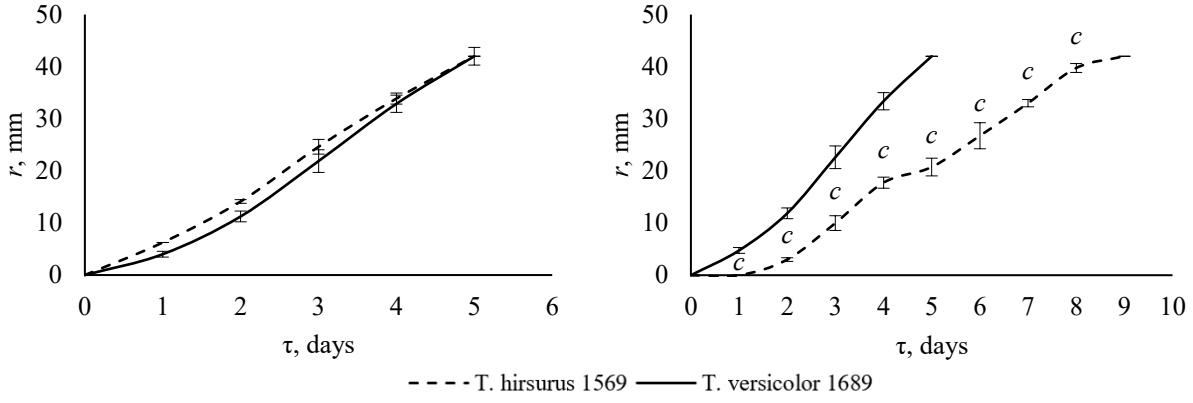
Materials and methods. The objects of the study were strains of *T. versicolor* 1689 and *T. hirsutus* 1569 obtained from the Collection of Cap Fungi Cultures of the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine (IBK). Glucose-peptone-yeast (GPY, control) and pectin-peptone-yeast (PPY) agarified nutrient medium was used for cultivation of the objects, in which pectin in the amount of 0.5% was used as a carbon source instead of glucose. Petri dishes were inoculated with an agar disc with 7-day-old mycelium and cultured at 28 °C. The study of cultural and morphological characteristics was carried out daily during the entire cultivation period. The colony growth was measured in four mutually perpendicular directions and used to construct growth curves. The radial growth rate was calculated using the formula:

$$\upsilon = \frac{r_2 - r_1}{\tau},$$

where r_1, r_2 are the colony radii at the beginning and end of the linear growth phase, mm; τ is the duration of the linear growth phase, days.

Cultivation was performed in triplicate. The results with values were considered statistically different: $a - p < 0{,}05$, $b - p < 0{,}01$, $c - p < 0{,}001$.

Results and discussion. The results obtained on the growth of the studied strains are shown in Fig. 1.



a *b*

Fig. 1. Growth dynamics of strains on: a - glucose-peptone-yeast and b - pectin-peptone-yeast media

Complete overgrowth of the Petri dish by both strains on GPY occurred in five days (Fig. 1. a). On the PPY (Fig. 1.b), strain *T. versicolor* 1689 showed similar results, while the other strain (*T. hirsutus* 1569) grew more slowly and overgrowth was observed in 9 days.

On GPY, the growth of *T. hirsutus* 1569 during the first two days was higher than for *T. versicolor* 1689, while on PPY medium, the colonisation rate of the Petri dish significantly decreased and differences in colony size were observed throughout the entire cultivation period. In addition, the effect of pectin on the growth of *T. versicolor* 1689 was not detected, while for *T. hirsutus* 1569 statistical differences in growth on different media were recorded.

The calculated radial growth rate for *T. hirsutus* 1569 strain on GPY was (9.21 ± 0.35) mm/day, and for T. versicolor 1689 – (9.63 ± 0.15) mm/day. On PPY medium, the average growth rate was (9.54 ± 0.21) mm/day, and for *T. hirsutus* 1569 the value of this indicator was (6.13 ± 0.12) mm/day.

Conclusions. Thus, the rate of pectinase synthesis by strain *T. versicolor* 1689 could potentially be higher than that of *T. hirsutus* 1569, so it is a promising object for further studies on enzymatic activity.

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