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COMPARATIVE CHARACTERISTIC OF DISAPPEARANCE OF REFERENCE STRAINS OF YEAST-LIKE MUSHROOMS OF THE GENUS CANDIDA ON VARIOUS NUTRIENT MEDIA

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INTRODUCTION

Candida generation yeast is divided into several species that are not similar in clinical and epidemiological values (Rebrova R.N., 1989; Dekhkankhodzhaeva N.A., 1996; Elinov N.P., 2002; Fotos PG, Lilly JP, 1998; Gautret P. et al., 2000). Yeast fungi of the generation Candida have always attracted the attention of doctors of various industries (Rebrova R.N. 1989; Mueller E., Leffler B., 1995; Elinov N.P., 2000; Safarov R.T., 2004; Bazhenov L.G. ., 2005; Paulain D., 2000). Specialists in the field of microbiology and infectious diseases believe that the yeast fungi of the generation Candida are opportunistic microorganisms, are found in the human body under normal conditions and cause pathology with various exogenous influences and changes (Dekhkankhodzhaeva N.A., 1995; Elinov N.P. , Vasilieva N.V., 2000; Mukhamedov I.M. et al., 2004; Bailey A. et al., 1995; Cannon RD, Chaffin WL, 1999).

Due to the need for a more accurate and correct diagnosis, various studies are being developed and conducted with microorganisms of the generation Candida. At the same time, the need for high-quality and relatively cheap nutrient media is increasing.

PURPOSE OF THE STUDY

A comparative study of the basic biological properties and growth characteristics of reference strains of Candida generation yeast grown in standardized nutrient media made from local raw materials.

RESEARCH METHODS AND MATERIALS

The studies were carried out in the laboratory EMYUKITI of the Ministry of Health of the Republic of Uzbekistan "National collection of microorganisms of human infection". Museum strains of C. albicans, C. tropicalis, C. krusei, C. guillermondii, provided by Professor L. G. Bazhenov, were taken for research.

Museum cultures were planted on media with a pH of 6.0-6.5. For identification, the type of filamentation, the number of chlamydospores and biochemical properties — carbohydrate fermentation — were determined. For identification, a methodological instruction was used, confirmed by the Ministry of Health of the Republic of Uzbekistan (N. Nuraliev et al., 2006).

For statistical processing of the obtained results, the Fisher and Student methods, which are in the modification of Ermoliev, were used. At the same time, Excell calculation programs were used on a Pentum-4 computer.

Rice bran extract (EOR) was prepared in 2 versions: in nutrient broth (EOR-1) and in 0.9% isotonic NaCl solution (EOR-2). When planting test strains of museum cultures of yeast fungi of the Candida generation, it was found that their growth in the main nutrient medium of the rice bran (EOR-1 and EOR-2) was the same as the standard control nutrient medium of Saburov.

After this study, a series of studies were conducted with different reference strains of the Candida generation.

RESULTS AND THEIR DISCUSSION

Results should be provided for each strain separately.

C.albicans. As a result of the experiment, it was found that the number of grown living cells of C. albicans in a nutrient medium containing a rice bran hydrolyzate exceeded 100 times.

With an increase in the number of dilutions

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in standardized culture media, no growth was observed (solution 108), but in the proposed culture media, cultures of reference strains were observed to grow, and when compared with other broths on the 3rd day of growth, the number of cells increased to 3x1010 ± 1x108.

After comparing the viability of C. albicans, the features of the revitalization of long-stored collection strains were examined. The process of revitalizing C. albicans strains using rice bran hydrosylate medium was successful. In standard nutrient media, all strains were not revitalized, but in the proposed media, growth of broths 105 and 106 was observed on day 3 with all biological properties preserved.

At the next stage of the study, the number of living cells in the colonies grown in various nutrient media was determined. In the calculation, the number of living cells of the broth 105 was not determined due to the same growth, but the broths 106 and 107 gave a noticeable difference in the number. In all broths, the difference was greater by 1 category ($p < 0.001$).

Therefore, the number of cells grown in different nutrient media was different. These nutrient media not only provide the process of revitalization of collection strains of C. albicans, but also accelerate their reproduction, thereby increasing the reliability of the next stages of identification, due to the large number of living cells.

When transplanting from one medium to another, microorganisms adapt, because of which many of them may die or fail to restore their biological properties. Given this, we carried out a transplant of cultures from the proposed environment in the control and vice versa. The transplanted reference C. albicans strains in the first case were not able to show their biological properties. The number of living cells decreased, as a result, the morphology of the colonies changed. This indicates that the proposed nutrient medium surpasses standardized media in terms of growth factors and other features. When transplanting strains from a standardized medium into the proposed medium, no negative effects were observed, which once again confirms the correspondence of the proposed nutrient medium for the growth of reference C. albicans strains.

The viability of hospital strains of C. albicans isolated from patient materials were classified by a similar method.

In the studied hospital strains, in all nutrient media, growth was observed in the required amount, starting from the second dilution. There was a difference in the third dilution, growth in a standardized medium was 3x105 colony forming units (CFU), and in the proposed culture medium was 8x105 CFU. With the increase in the number of broths, the difference became significant. In all solutions, the growth of hospital strains of C. albicans was quantitatively higher on rice bran nutrient medium.

C.krusei. The above listed studies were repeated with C.krusei. The above transplants and sequential identifications show that the viability of the reference C. krusei strains planted on the proposed medium is somewhat lower than those planted on a standardized medium.

The viability of the reference C. krusei strains grown on rice bran-based medium was satisfactory; growth in broth 106 after 48 and 72 hours was uniform. In broth 107, their viability was 2-3 points lower than in the compared medium. But, in the big picture, C. krusei grew quite well in the developed medium, in particular, in the broth 108 of the standardized medium on the third day it did not grow, while on the ESM the number of microbial bodies of the reference culture reached 10,000 units.

When comparing the activity of the reference strains of C. albicans and C. krusei, it was established that on the second day on broth 107 these strains differ from each other in terms of these indicators. If C.albicans gave the results, respectively, 1x109 ± 1x107, then C.krusei gave the result 3 points lower ($p < 0.001$), and in broth 108 did not give growth.

This situation continued on the third day, but the viability of C. krusei on a standardized medium was higher than in the proposed medium.

The revitalization process in standardized environments yielded higher rates than C. albicans, the same result was obtained on an environment with ESM. Cultures stored for a long time in a subcultural state during transplantation onto media with ESM have the ability to give the necessary growth. The colonies grown in the two media did not differ in the number of living cells and did not give a noticeable difference, but C.krusei lagged behind C.albicans in the total number of living cells. When transplanting from the proposed environment to a standardized result, it fell by 3-5 points. This is an indicator of low cultural effectiveness. During the passage of C.krusei culture from a standardized culture medium to the proposed number of microorganisms grown, it also decreased.

C.tropicalis. To study these fungi, a series of experiments was carried out with other species of yeast from the Candida family. Comparison was made with data from C. albicans and C. krusei. When comparing the growth of the reference C.tropicalis strains in a standardized nutrient medium and ERO, it was established that with an increase in the degree of separation on the second day, the quality of culture growth decreases.

When sowing C.tropicalis on the proposed medium on the basis of ERO, it gives multiple colonies, after 48-72 hours on broth 106 it gives

uniform growth, after 48 hours on broth 107 it's 2.5 times more, after 72 hours 2 times more. More than 2000 colonies were found in broth 108 after 48 hours, and no growth was observed in a standardized medium.

Studies conducted on the revitalization of the reference C.tropicalis strains gave indicators very similar to those obtained from studies of C.albicans and C.krusei. The studied cultures of C.tropicalis gave good growth on the proposed nutrient medium. Further studies of the growth in the number of C.tropicalis cultures showed that colony growth was observed in all broths. The number of living C.tropicalis cells grown in ERO was 1-2 points lower.

In a culture medium containing rice bran components, C.tropicalis cultures did not show the ability to grow. Thus C.tropicalis showed low growth ability in ERO.

C.guillermondii. Similar strains were also tested with these strains. The ability of these strains to grow on the second and third days was the same, but in the number of colonies they were significantly inferior to other studied strains.

The data obtained showed that in the colonies of C. guillermondii grown on media containing components of rice bran, the number of living cells was 10–100 times higher ($p < 0.001$). This was observed from the first day of traditional growth to the next day. The revival of the culture of C.guillermondii in nutrient media with ERA occurred actively and qualitatively, and the colony of these strains developed 100-1000 times more.

In the study of the number of living cells in the colonies of the reference C. guillermondii strains, it was found that in the nutrient medium containing the components of the rice bran the colonies were large, the number of microbial bodies was large, which was 10-100 times in broths 106 and 107.

When C. guillermondii was re-plated on medium with rice bran components, a decrease in the number of cells was not observed; on the contrary, a 10-fold increase in microbial mass was observed. And when transplanted to standardized nutrient media, a decrease or non-change in the number of cells was observed, i.e., equal to the number of planted cells. The reason for the increase in the number of microbial bodies is a good indicator of the proposed nutrient medium, i.e., this medium provides active division of the microbial bodies of the studied strains of the Candida family of fungi.

FINDINGS

1. The proposed nutrient medium based on rice bran (ERO -1 and ERO-2) is optimal for the growth of colonies, cell viability, for the revitalization of long-stored cultures of Candida sp., To increase the number of microbial bodies in the grown cultures.

2. Growth, vitality and recovery in the proposed environment were high for C.albicans and C.guillermondii.

REFERENCES

1. *Bazhenov L.G., Artemova E.V., Nechmirev A.B. The crystallographic method for the identification of microorganisms and its capabilities using the example of fungi of the genus Candida // Infection, immunity and pharmacology. - 2005. - No. 5. - S. 16-18.*
2. *Elinov N.P. Medical mycology by the XXI century - at the beginning of the third millennium // Problems of medical mycology - 2000. - V.2. - No. 4. - S.6-12.*
3. *The study of the quality of the nutrient medium based on rice bran for the cultivation of bacteria / Nuraliev N.A., Nometov B.N., Bektimirov A.M.T., Zhumaniyozov K.Y. //Method. recommendations. - Urgench. - 2004. - 11 p.*
4. *Muller E., Leffler V. Mycology. M: World. - 1995 .-- 343 p.*
5. *Nuraliev N.A., Iskhakova H.I., Allaberganova Z.S., Bektimirov A.M. Biological properties of yeast fungi of the genus Candida and their bacteriological diagnosis // Methodological recommendations. - Urganch, 2006 .-- 14 p.*
6. *Rebrova R.N. Fungi of the genus Candida in diseases of non-fungal etiology. M: Medicine. - 1989. - 128 p.*
7. *Bailey A., Wadsworth E., Calderone R. Adherence of Candida albicans to human buccal epithelial cells: host-induced rpotein synthesis and signaling events. Infect Immun 1995; 63 (2): 569-572.*
8. *Cannon R. D., Chaffin W. L. Oral colonization by Candida albicans. Crit Rev Oral Biol 1999; 10 (3): 359-383.*
9. *Paulain D. Combined detection of mannanenia and anti mannan antibodies for the diagnosis of systemic infections caused by pfthogenic Candida species in ICU and oncohaematology patients // 6th Congress of the ECMM, November 9-11, 2000, Barcelona, Spain. Satellite symposium. P.1.*