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Current state of the organization of the medico-social help to elderly and senile age people

Keywords: advanced age, living conditions, medico-social help.

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FUNGUS *TRICHODERMA*: ANTIBIOTIC ACTIVITY OF METABOLITES

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Summary: The problem of search and selection of new antibiotics of the metabolites of imperfect fungi is particularly relevant in our time. The effect of metabolites of fungi of the genus *Trichoderma* in a number of gram-negative and gram-positive microorganisms is studied. Antibiotic effect of the studied metabolites is shown.

Keywords: bactericidal effect, the imperfect fungi, metabolites, gram-negative and gram-positive bacteria, method of the holes.

Introduction

The interest in the imperfect fungi and their metabolites in the latter time increases. Metabolites and extracts isolated from a number of imperfect fungi are often the producers of many biologically active compounds, in particular, new antibiotics [2, 4, 7]. These metabolites are primarily characterized by an important property - the bactericidal [1, 3]. It is known that the fungi of the genus *Trichoderma* are the producers of metabolites having high antibiotic activity against fungi and bacteria.

Extremely promising in this respect fungi *T. citrinoviride, T. asperellum, T. hamatum, T. harzianum*. Describes the preparation of the culture fluid of fungi antibiotics - pentaibolov. Shown that these antibiotics are highly active against fungi, gram-positive bacteria and mycobacteria [6]. Despite the relatively long period of research data fungi isolates in central Siberia, and their metabolites are not sufficiently studied [5, 8]. The purpose of this study was to investigate antibiotic activity metabolites of fungi of the genus *Trichoderma* against a number of opportunistic strains of microorganisms.

Materials and methods

The objects of study were sterile metabolites derived from the species *T. citrinoviride* - strains MC, TN4; species *T. asperellum* - strains 01-00, K12, 30, of *T. hamatum* - MO strain, the species *T. harzianum* - strains M 99 / 5, 0-97 and from netipirovannogo strain 119/85 *Trichoderma sp*. Fungi were cultured on Czapek broth; term cultivation for metabolites accounted for ten days. To study the bactericidal activity of metabolites in the experiment were taken opportunistic bacteria: two strains of *Acinetobacter baumannii* gramnegativnogo and one strain grampozitivnogo *Staphilococcus haemoliticus*, isolated from patients pankreanekrozom patients Clinical Hospital № 7 City of Krasnoyarsk. For pre-culturing isolated strains were plated on nutrient agar (RM-agar), produced by Federal State Unitary Enterprise;State Scientific Center of Applied Microbiology and Biotechnology, and then incubated in an incubator for three days at 37 ˚ C. Received isolated typical colonies of each species were selected loops and suspended in test tubes with sterile saline, according to the standard turbidity. Sown dose suspensions of microorganisms was 1.5 h108 CFU / ml (0.5 turbidity standard McFarland). Sowing prepared suspensions was performed pressed with a cotton swab in three directions at the plate dried Mueller-Hinton agar, poured thick. Determination of bactericidal activity of the investigated extracts was performed by the wells. In the hole made with a sterile cork borer in a newly seeded plates, sterile, replaceable spouts studied metabolite was added in an amount of 0.1 ml. Control was saline. The experiments were conducted in five replicates. After entering into the wells of metabolites sown cup without turning transferred to a thermostat and incubated at 37 ˚ C for ten days. Observations on the growth of test cultures started after days of incubation. Statistical analysis was performed using software package STATISTICA v.6.0. Calculated the mean and standard deviation. Significant differences were determined by nonparametric Mann-Whitney test.

Results and discussion

In the course of this work it was found that part of the studied metabolites have a marked antibiotic activity against the test bacteria (Tables 1 and 2):

Table 1

Table 2

Thus, the most pronounced effect of the antibiotic was found in metabolites of the fungus *Trichoderma* strain 119-85 and strain M 99 / 5: First inhibited *A. baumannii* strain 40 with a maximum area of growth inhibition on the tenth day 16 ± 3 mm, and *S. haemoliticus* strain 3 with a maximum area of suppression on the tenth day 16 ± 1 mm, the second suppressed similar to strains with a maximum area of growth inhibition on the tenth day 17 ± 2 mm, and *S. haemoliticus* 3 with a maximum area of suppression on the tenth day 14 ± 3 mm. Antibiotic effect on the studied strains of bacteria was observed in TN 4, MC, MO, and strain 30.

Conclusion

It is shown that the diameter of the inhibition of growth with increasing duration of the experiment increases, but only slightly. Studies have shown that the investigated strains 119-85 and M 99 / 5 *Trichoderma* fungi can be considered as promising producers of new biologically active substances.

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Table 1

Antibiotic activity of metabolites of fungal strains of Trichoderma species against opportunistic microorganisms

Strains of opportunistic microorganisms	Growth inhibition zone diameter (M ± m), mm; 5 days cultivation									
	Studied strains of fungi of the genus *Trichoderma*									
	МК	119-85	97/6	М 99/5	К-12	ТН4	01-00	МО	0-97	30
A. baumannii 30	-	-	-	-	-	17,0 ±1	-	12,0 ±1	-	16,0 ±1
A. baumannii 40	12,0± 1	12,0±2	-	15,0±2	-	-	-	-	-	-
St. haemolyticus 3	-	14,0±2	-	13,0±3	-	-	-	-	-	-

Note: «-» – antibiotic activity was not detected.

Table 2

Antibiotic activity of metabolites of fungal strains of Trichoderma species against opportunistic microorganisms.

Strains of opportunistic microorganisms	Growth inhibition zone diameter (M ± m), mm; 10 days cultivation									
	Studied strains of fungi of the genus *Trichoderma*									
	МК	119-85	97/6	М 99/5	К-12	ТН4	01-00	МО	0-97	30
A. baumannii 30	-	-	-	-	-	20,0 ±4	-	17,0 ±2	-	19,0 ±2
A. baumannii 40	12,0±3	16,0±3	-	17,0±2	-	-	-	-	-	-
St. haemoliticus 3	-	16,0±1	-	14,0±3	-	-	-	-	-	-

Note: «-» – antibiotic activity was not detected.

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CONTENT OF CALCIUM AND PHOSPHORUS IN THE BLOOD PLASMA UNDER INFLUENCE BY DERIVATIVES OF B-CYCLODEXTRIN

In the present work the maintenance of the element maintenance of calcium and phosphorus in plasma of blood at laboratory animals is investigated at application of the new derivative connections which are being clathrate and conjugate of β-cyclodextrin with acid paraaminobenzoic were used. Positive dynamics of the maintenance of defined elements under influence of the synthesized substances is revealed. The most positive tendency is found out in the skilled group received conjugate of β-cyclodextrin with acid paraaminobenzoic.

Keywords: acid paraaminobenzoic, β-cyclodextrin, phosphorus, calcium

Maintenance phosphorus-calcium a homeostasis - a necessary condition for normal ability to live of an organism.

About 99 % of all quantity of calcium and 85 % of phosphorus are in the bone fabric, being the core of depot in an organism. Allocate the various mechanisms which are taking part mastering of given minerals in an organism. Recently a greater role in a phosphorus-calcium exchange give kidney y to the device [5].

There is a set of various factors capable to influence mechanisms всасывания the given elements. One of such is paraaminobenzoic the acid which physiological role up to the end is not investigated yet. It is known, that as chemical compound acid paraaminobenzoic (PABA) it is known with 1863, with 1939 as the substance possessing properties of vitamin, and with 1940 is established its antibacterial property in relation to сульфаниламидам and it sulfonamide has been allocated from yeast then its necessity for synthesis of a folic acid [13]. Besides by researchers it is noted, that PABA it is capable to stimulate physical endurance and working capacity [7], and also positively to influence a condition of the central nervous system [4, 6]

Alongside with it is known, that β-cyclodextrin (I) and its numerous derivatives have found wide application in physiology and pharmacology, mainly as "containers" of medical products, owing to the unique opportunity to encapsulation various waterproof connections (formation of connections of inclusion of type "visitor-owner") [8, 11]. Encapsulation protects the included medicinal substance from biodecomposition, promotes increase of its solubility and promotes its selective delivery in a necessary place for the demanded period of time [9,10,12]. In previous our works high physiological and pharmacological activity of similar connections, in