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IDENTIFICATION OF THE STAPHYLOCOCCUS AURES FROM BIOCHEMECAL NATURE

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Abstract

The germs from Staphylococcus type are Gram – positive, disposed in irregular batches, aerobe, facultative anaerobe, immobile, non sporulated, catalyze positive. The isolation of the Staphylococcus is made on the agar-blood or on the hyper chlorite medium for the products intensely contaminated and hemolysis is the main hemolysis secreted by Staphylococcus Aureus and the main factor of pathogenicity of this bacterial species. The staphylococci produce non-diffusible pigment, that colors only the bacterial colony but not also the culture medium, of golden yellow color. The pigment genesis is more intense at the room temperature and in the presence of the oxygen. On the mediums with blood appears beta hemolysis.The staphylococci are resistant to the conditions of external medium. They resist in cultures at the refrigerator for some months, in dry fastering 2-3 months. They are relatively resistant to antiseptic and disinfectants and the gamma radiations, at the action of colorants. They can be destroyed in 60 minutes at the temperature of 60°C, are sensitive to bacteriophages, to UV radiations.

Keywords: pathogenicity, aerobe, catalyze positive

INTRODUCTION

The *Staphylococcus Aureus* colonizes the nostrils and the colon from where they can contaminate the tegument. The material support of the transmission is represented by soil, sand, furniture, carpets, dust and air from the rooms.

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The following products have bacteriostatic effect on the *staphylococcus* strains: lemon, pineapple, apple, apricot, peaches juice, chocolate, cocoa.

The staphylococci are especially resistant to antibiotics. Over 95% of the staphylococci are resistant to penicillin. The staphylococci sterns resistant to methicillin are poli resistant strains exteriorizing the concomitant resistance toward cephalosporin, erythromycin, clindamycin.

They are still sensible to vancomicin, although in some countries were noted already some strains resistant also to this reserve antibiotic.

MATERIAL AND METHODS

Were used thus, in order to accomplish the proposed objectives, the methods that underline the biochemical nature of *Staphylococcus Aureus.*

Methods of underlining the catalysis

- Catalysis decomposes the oxygenated water in water and oxygen
- The oxygen underlined is underlined by forming the gas bubbles
- Method – the culture of research is suspended on blade in a drop of H2O2
- The appearance of the bubbles – positive catalysis

Methods of underlining the oxidase

- The oxidative enzymes act on some substances producing colorant compounds

Methods of prominence – with tertametil paraphenyl diamine

- bands impregnated with reactive
- the bands wet with distilled water is deposed on part of the colony
- the color goes in dark purple – positive oxidase
- the reactive is dripped on the suspect colonies

Methods of prominence of the coagulase

- on the blade
- a small quantity of colony is deposited in a drop of plasma
- the appearance of small coagula – positive coagulase
- in tubes
- in test tubes with citrate plasma is added the culture in broth
- is incubated at thermostat 24 hours
- the appearance of coagulas – positive coagulase

RESULTS AND DISCUSSIONS

Table 1.

The prominence of the *Staphylococcus Aureus* by the biochemical nature.

Biochemical nature			
The prominence of catalysis	The prominence of oxidases	The prominence of coagulase on the blade	The prominence of coagulase in the tube
+ Formations of the gas bubbles	- The color doesn't go to dark purple	+ The presence of coagulas	+ The presence of coagulas

Fig. no.1. Left –negative catalysis bacteria
Right - positive catalysis bacteria
Source - atlas.microumftgm.ro\bacteriologie\bactgen\cbio.html

The fast identification of the species *Staphylococcus Aureus can be made with the help of the* trade aditives of indirect agglutination.

The reagents sensitized with fibrinogen and G immunoglobulins couple the connected coagulase, respectively the protein A from the wall of *Staphylococcus Aureus*, which has as macroscopic expression the agglutination of the mixture between the reactive and the culture of *Staphylococcus Aureus*. The reagents that include additional antibodies anti-polysaccharide capsular which assure the identification with extra sensitivity of the strains of *Staphylococcus Aureus resistant to methicillin,* that express weakly the parietal antigens.

The catalysis is a hemoprotein that decomposes the peroxide of hydrogen in water and oxygen. The bacteria that produce it is protected thus of the lethal effects of the hydrogen peroxide that appeared as the final metabolite in the aerobe metabolism of the carbohydrates. Immediately and after 5 minutes, from the accomplishing of the test, was observed the appearance of the gas bubbles. The speed of the H2O2 decomposition increases together with the temperature. The false positive reactions can be owed to the oxygen dissolved in the reactive. The inconvenient can be avoided if the reactive is agitated with the pipet before the utilization. The oxidative enzymes act on some substances producing colored compounds, but in case of *Staphylococcus Aureus* the test at oxidase is negative.

The free coagulase is an extracellular protein with role on enzyme that coagulates the citrated plasma.

Connected coagulase („clumping factor") component of the cellular wall that reacts directly with the fibrinogen, determining the aggregation in batches of the bacterial cells with masses of fibrin.

The result for both types of coagulation in case of *Staphylococcus Aureus* is positive.

The multicentric evaluation performed on a batch of 892 staphylococci in the reference laboratories from Nederland, France and Switzerland underlined sensitivities and respectively specificities of 98,2 and 98,9 for Staphaaurex plus.

The fast identification of *Staphylococcus Aureus* became possible also with the help of the test of hybridization of the nucleic acids using the bacterial culture, the clinical test respectively.

CONCLUSIONS

The identification on the basis of the biochemical nature by tests of catalysis, oxidase and coagulase, underlined the fact that *Staphylococcus Aureus* is positive at catalysis and coagulase, and negative at the oxidase test.

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