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IDENTIFICATION OF SALMONELLA, SHIGELLA IN FOOD TOXINFECTIONS

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Abstract

The alteration of meat in low temperatures is accompanied by the production of some compounds of abnormal color, as ammonia, sulphureted hydrogen. The direct physical and bacteriological methods show that the samples of meat tainted are changing the organoleptic characteristics (smell, consistency, smell and taste). In order to foreseen the alteration or the period of validity, is asked for the performing of a test of freshness of meat. It was investigated their alteration, as indicators of alteration of red meat, packed in vacuum, kept at 1°C , for a period of 8 weeks. In case the meat kept in aerobe conditions, it is quite the opposite. The fresh meat kept in the refrigerator is attacked by psychorophilic organisms. In case of the meat with a pH approximately of 5,6 there are present sufficient simple hydrates of carbon in order to sustain approximately 10^8 *microorganisms/* cm^2.

Keywords: sulphureted hydrogen, ammonia, alteration

INTRODUCTION

All the serotypes of enteric *Salmonella* enteric subspecies are parasites for human being and mammals, while the other subspecies and bongori *Salmonella* are met mainly in birds and animals with cold blood. The two major sources, the human being and the animals, are responsible for the pollution of the soil and of the waters, where they can survive for a long time.

A series of factors as: intensification of the commerce and of the travels at great distances, the population migrations, the industrialization of the food and of the growth of the animals for consumption, have contributed to the wide spreading of serovars and to the growth of morbidity by salmonellosis.

The majority of the other serotypes instead don't have a specificity of host. There are serotypes of *Salmonella* with specificity of host, present only in human being (*S. typhi, S. paratyphi*), in animals (*S. typhisuis* – in pigs, *S.*

abortus ovis – in sheep) or in birds (*S. gallinarum, S. pullorum*). The isolation of the salmonellas from human host has always a clinical significance – sick person or healthy carrier. In general there is a geographical distribution of the salmonella, in our area being isolated most frequently Salmonella typhimurium, Salmonella enteritidis and in some periods*Salmonella agona*.

Toxina *Shiga*is a thermo labile exotoxin, with neur-, entero- and cytotoxic properties, with role in blocking the protein synthesis. By cytotoxic effect on the capillary endothelium it determines vascular complications and the producing of the hemolytic-uremic syndrome in shigellosis. It is produced by *S. dysenteriae* type 1 (*S. shigae*) and only in feeble quantities by the other species. For this cause *S. shigae* is the most pathogen from all the types.

The period of incubation is short (1-3 days), and the debut sudden, with fever, severe abdominal cramps, tenesmus, stools with initial watery nature, then mucopurulent and pathognomonic sanguinolent, accompanied by neurologic signs. Severe clinical forms are registered especially at extreme ages and in immune-depressed. *S. dysenteriae* serotype 1 (*S. shigae*) is responsible for the most severe forms of disease, complicated with hemolytic-uremic syndrome.

MATERIAL AND METHODS

We accomplished a prospective study, based on the microbiologic diagnosis registered in the bacteriological register of the laboratory of medical analysis, S.C. Diaser, Oradea.

The duration for which was extended the study is of 5 years, included in the period 01.01.2014-31.12.2019.

For the performing of the study was used also the archive, registered in the specific program of the computer from the laboratory of S.C. Diaser, Oradea, the computerized data base of the unit, respectively.

Necessary materials for the performing of the examination:

■ A recipient of collection (collection recipient of fecal matter with collecting spoon) with transport medium
■ Wood spatula
■ Latex gloves

For the collection of fecal matter it has to be collected a sample of fecal matter of 5-10g introduced in the collection recipient of fecal matter with transport medium. If the stool is liquid, it will be collected 5 ml. It is recommended to be chosen a liquid, mucous and bloody portion, if there is one.

RESULTS AND DISCUSSIONS

In regard to the culture medium, the broth, for *Salmonella*with acid selenite of sodium in many versions, has the specificity of the fact that the selenite with cysteine gave the best results to the isolation of the serotypes met equally in human being. Its productiveness can be enriched also in the period of incubation shortened 12-18 hours by incubation 40-41°C. When the possibilities don't allow but a single medium of enriching, the medium with selenite is preferable. It is inhibitor for other enterobacteria (especially lactose-positive), but *Proteusul*and*Shigella*are developed relatively frequently. The Rappaport-Vasiliadis broth, underlined also as having a good capacity of enriching, is recommended and mentioned with higher results for the enriching of all the other serotypes, with the exception of *Salmonella serotip Typhi*.

The broth for the gram-positive results has the capacity more reduced than the selenite broth or the tetrathionate broth, allowing also the growth of other gram-positive bacilli, not only of the enterobacteriacae, for this reason it is recommended also for the isolation of some non fermented gram-negative bacilli pathogen conditioned.

The culture medium with the tetrathionate broth was used for the isolation of *Salmonella* serotype*Typhi*. It is used in more limited quantity because of the laborious preparation and the difficulties of commercialization as industrial product "ready to be used" or in dry form.

The microscopic examination of faecal samples indicates usually the presence of erythrocytes and leucocytes in a large number. The test has a significance if there is a number of polymorph nuclear (PMN) larger than 10/hpf (microscopic field with large power – objective 40x). The most frequently involved are the germs from the group *Shigella, Salmonella, Campylobacter, Escherichia coli* enteroinvasive and enterohemorrhagic. The greater the number of leucocytes present in faecal matters, the larger the probability of the existence of an invasive pathogen agent.

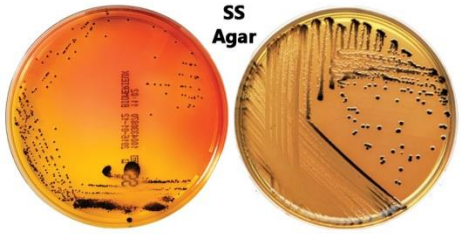

Figura 1. *Salmonella – Shigella,* colonii lactozo – pozitiv, mediul de cultură SS.
https://microbenotes.com

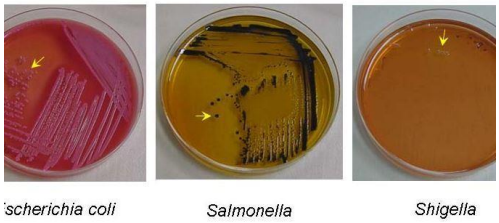

Figure 2. *Escherichia Coli, Salmonella, Shigella*, lactose – negative colonies for E. Coli and Shigella. Lactose – negative colonies, Salmonella. Culture medium SS – Agar.
https://www.microbeonline.com

Figura 3. *Salmonella*: colonii "ochi de pisică".
Mediul de cultură SS
https://catalog.hardydiagnostics.com

The efficiency of the culture medium for *Salmonella – Shigella*is underlined in the study regarding the "Superiority of agar MacConkey compared to Agar *Salmonella-Shigella*for the isolation of *dysenteriae* Type 1".

Agar MacConkey was superior to the SS agar in detecting *S. disenteriae type 1*; 83% of the isolated were detectable on agar MacConkey, compared to 40% on agar SS. In exchange, 84% of the isolated *S. flexneri were detectable* on agar SS, compared to 51% only on agar MacConkey. These discoveries confirm the fact that, for the culture of the faecal test tubes about which is considered that *S. S. disenteriae tip I*, one of the used mediums, should be non-inhibitor.

CONCLUSIONS

The mediums moderately selective have a higher selective capacity, inhibiting considerably the lactose-positive enterobacteriaceae. Thus, they allow the unhindered development of lactose-negative enterobacteriaceae as *Salmonella, Shigella, Providencia, Proteus, Morganella* and tardive lactose-

positive, *Citrobacter, Serratia,Hafinia*. Enterocolitis *Yersinia*is hardly developed, usually after the continuation of the incubation 22-29 ℃ maximum 24 hours, and on some mediums, as ADCL, XLD, IM, SMID, is strongly inhibited. This mediums are usually used for the isolation of pathogens from the *Salmonella and Shigella* genre.

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