PRODUCTION OF HYDROGEN SULFIDE BY INTESTINAL BACILLI IN DIFFERENT GROWING MEDIA

TRANSLATION NO. 1158

August 1964

UNITED STATES ARMY
BIOLOGICAL LABORATORIES
Fort Detrick, Frederick, Maryland
DDC AVAILABILITY NOTICE

Qualified requestors may obtain copies of this document from DDC.

This publication has been translated from the open literature and is available to the general public. Non-DOD agencies may purchase this publication from Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield, Va.
PRODUCTION OF HYDROGEN SULFIDE BY INTESTINAL BACILLI IN DIFFERENT GROWING MEDIA

USSR

Following is the translation of an article by A. A. Shemyakina in the Russian-language publication Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (Journal of Microbiology, Epidemiology, and Immunobiology), No 11, 1963, pages 74-76.

From the Dorozh Sanitary-Epidemiological Station of the Sverdlovsk Railway

(Received by Editor 10 November 1962)

The ability to produce hydrogen sulfide during life activity is as we know one of the differentiating characteristics for various microorganism representatives of the intestinal family.

It is widely accepted that numerous representatives of the genus Escherichia, and also Salmonella produce hydrogen sulfide, but all species of dysentery bacilli do not have this capability. However, several investigators (Shiben, Pik-Levontin, Smirnov, and Trifonov) have pointed to the ability of certain strains of dysentery bacilli to form hydrogen sulfide. In our study, using for the purpose of determining hydrogen sulfide production a broth prepared from placenta (with the addition of one percent peptone and 0.5 percent sodium chloride) have also noted the presence of hydrogen sulfide in certain strains of dysentery bacilli.

Several experiments were set up to study this problem, aimed at discovering what effect the nutrient medium has on the formation of hydrogen sulfide by various representatives of the intestinal family of microorganisms.

Nutrient media included meat-peptone broth, one percent peptone water, Hottinger broth, and placental broth, prepared in the usual formulations. Innoculation was performed simultaneously on all media using a single loop of day-old agar culture and maintained at 37 degrees. The record of result was entered daily for
three days. The presence of hydrogen sulfide was determined by the
darkening of filter paper moistened with a 4 per cent solution of
lead acetate secured under the stopper of a tube containing 5 ml
of the inoculated medium being tested. Simultaneously, three
test tubes containing unincoculated medium being tested and the
same indicator paper strips was maintained under the same conditions.

In all 6 experiments were performed, and 50 cultures were
tested for the presence of hydrogen sulfide: 22 cultures of dys-
entery bacillus, 11 pathogenic types of intestinal bacillus (026,
055, 0111) 14 cultures of intestinal bacillus isolated from water
and rinsings, 2 cultures of Breslav bacillus, and 1 cultures of
paratyphoid bacillus. All the cultures were purified beforehand
through two-three-fold inoculation. All those were typical in
cultural-biochemical and serological properties.

Formation of Hydrogen Sulfide by Cultures of Microorganisms of
of the Intestinal Family on Various Media

<table>
<thead>
<tr>
<th>Наименование культуры</th>
<th>a) culture</th>
<th>b) number of cultures</th>
<th>c) results of seeding on different media</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>placental broth</td>
</tr>
<tr>
<td>Dysenteriae</td>
<td>22</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Intestinal bacillus,</td>
<td>11</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Intestinal bacillus,</td>
<td>14</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Pathogenic</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Pathogenic</td>
<td>50</td>
<td>38</td>
<td>12</td>
</tr>
</tbody>
</table>

Symbols: + positive result; - negative.

Legend: a) culture; b) number of cultures; c) results of seeding on
different media; d) placental broth; e) Nottinger broth; f) meat-
peptone broth; g) 1% peptone water; h) dysenteric; i) intestinal
bacilla, pathogenic; j) intestinal bacilla, nonpathogenic; k) sal-
monella; l) absolute; m) total.