Isolation of Oxidase-Negative *Pseudomonas aeruginosa* from Urine Culture

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An isolate of *Pseudomonas aeruginosa* lacking characteristic indophenol oxidase was recovered from a catheterized urine specimen.

The patient had a chronic urinary tract infection secondary to prolonged usage of phenacetin. In March 1979, renal calculi were surgically removed. The patient had been on penicillin (20,000,000 U per day) for 72 h before surgery. Seven days postoperatively, gentamicin and ampicillin were administered. Renal function improved, and the urine culture showed growth of *P. aeruginosa* with a colony count of less than 10,000/ml. The patient was placed on oral medication (nitrofurantoin) and discharged. On 20 May 1979, the patient was readmitted with a severe urinary tract infection. Gentamicin therapy was started after a catheterized urine specimen had been submitted to the microbiology laboratory for culture.

The urine was inoculated with a calibrated 0.001-mm loop to 5% sheep blood agar and MacConkey agar. After 24 h of incubation, there were more than 100,000 colonies of gram-negative bacilli per ml. Beta hemolysis and greenish pigmentation were produced on blood agar, and colorless, lactose nonfermenting colonies appeared on the MacConkey agar.

Indophenol oxidase is an integral part of the identification schema for glucose nonfermenting gram-negative bacilli. An organism with biochemical and physical characteristics of *P. aeruginosa* was isolated; however, all tests for indophenol oxidase were negative. The oxidase test was performed with the PathoTec Co Strips (General Diagnostics, Div. of Warner-Lambert Co., Morris Plains, N.J.), a Cepti-Seal reagent dropper (Marion Scientific Corp., Kansas City, Mo.), and filter paper saturated with 1% aqueous tetramethyl-p-phenylenediamine solution. Biochemical characteristics were tabulated (profile index no. 2202000-63) by using an API 20E with oxidative-fermentative medium and motility tubes incubated for 48 h at 35°C (Analytab Products, Plainview, N.Y.) (3). Table 1 shows that this organism had biochemical characteristics consistent with *P. aeruginosa* except for the

### Table 1. Biochemical characteristics of *P. aeruginosa* compared with those of the oxidase-negative isolate

<table>
<thead>
<tr>
<th>Tests for:</th>
<th>P. aeruginosaa</th>
<th>Oxidase-negative isolateb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucoseb</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Xyloseb</td>
<td>+ (−)</td>
<td>+</td>
</tr>
<tr>
<td>Mannitolb</td>
<td>+ (−)</td>
<td>−</td>
</tr>
<tr>
<td>Lactoseb</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Maltoseb</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Glucose (gas)b</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Catalase</td>
<td>4+</td>
<td>4+</td>
</tr>
<tr>
<td>Oxidase</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>Growth on MacConkey agar</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Simmons citrate</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Urea</td>
<td>+ (−)</td>
<td>−</td>
</tr>
<tr>
<td>Nitrate reduction (gas)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Indole</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Triple sugar iron</td>
<td>K/K</td>
<td>K/K</td>
</tr>
<tr>
<td>H2S butt</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Gelatin hydrolysis</td>
<td>+ (−)</td>
<td>+</td>
</tr>
<tr>
<td>Motility</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Pyocyanin</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Growth at 5, 25, 37, and 42°C</td>
<td>−, +, +, +, −, +, +, +</td>
<td>−, +, +, +, +, +</td>
</tr>
<tr>
<td>Lysine decarboxylase</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Arginine decarboxylase</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Ornithine decarboxylase</td>
<td>−</td>
<td>−</td>
</tr>
</tbody>
</table>

a +, Positive test; −, negative test; K, alkaline.
b Oxidative-fermentative base.

### Table 2. Antibiotic susceptibility

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Zone diam (mm)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>6.1</td>
<td>Resistant</td>
</tr>
<tr>
<td>Cephalothin</td>
<td>4.3</td>
<td>Resistant</td>
</tr>
<tr>
<td>Kanamycin</td>
<td>12.7</td>
<td>Resistant</td>
</tr>
<tr>
<td>Colistin</td>
<td>13.9</td>
<td>Resistant</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>13.9</td>
<td>Resistant</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>15.8</td>
<td>Sensitive</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>21.3</td>
<td>Sensitive</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>9.4</td>
<td>Resistant</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>9.1</td>
<td>Resistant</td>
</tr>
</tbody>
</table>
lack of oxidase activity (4). Kirby-Bauer antimicrobial susceptibility testing was performed (Table 2). The susceptibility pattern was consistent with patterns obtained for \textit{P. aeruginosa} (1).

The lack of oxidase may have been due to antibiotic therapy (2). Our isolate was identical to the type 1 isolate of Hampton and Wasilauskas (2) with the exception of mobility and urea. In each case, an aminoglycoside antibiotic had been administered before isolation of the oxidase-negative \textit{P. aeruginosa}. This is the first isolate of an oxidase-negative \textit{P. aeruginosa} to have been found by our laboratory.

\textbf{LITERATURE CITED}


