CORRECT DESCRIPTION OF *PSEUDOMONAS MILDENBERGII*
BERGEY ET AL., 1930

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In 1922, Hermann Mildenberg published a comparison of two bacteria; one was the München strain of "Bac. cyanogenes" isolated from blue milk, and the other was a blue bacterium newly isolated from air at the University of Cologne. Mildenberg wanted to know whether the blue bacterium from the air was the same as the blue milk bacterium. In presenting detailed descriptions of both strains, he referred to the blue milk bacterium as St. M. (Stamm Muenchen), and to the isolate from air as Bl. Bac. (Blaubacillus). Although the two proved to be different, he did not give a name to the air isolate and so it entered the literature as "der Blaubacillus" of Mildenberg.

A description purported to be that of Mildenberg's blue bacterium appeared for the first time in the 3rd edition of *Bergey's Manual* (Bergey, 1930) under the name *Pseudomonas mildenbergii*. Unfortunately in translating from German to English, the descriptions of Mildenberg's bacterium and "Bac. cyanogenes" were confused, and the description which emerged was a mixture of the two. This incorrect description has been copied in each succeeding edition of the *Manual* so that a correct description under the name *P. mildenbergii* has never been published. Perhaps for this reason I have not been able to acquire authentic strains, although I have written to many likely places both here and abroad. The cultures I have received under the name *P. mildenbergii* fit the incorrect description of *Bergey's Manual* and are, therefore, not authentic strains. As a matter of fact, they conform to the description of *P. conveca* Chester 1901 and should be so redesignated. Table 1 gives the histories of five strains which were received as *P. mildenbergii*, and of another strain which I identified as *P. mildenbergii* on the basis of agreement with the erroneous description repeated in the latest edition of *Bergey's Manual* (Breed, Murray, and Smith, 1957).

In order that the correct description of *P. mildenbergii* may be known and the name may be dissociated from strains falsely bearing the name, the correct description is herewith presented in the form in which it should be substituted in *Bergey's Manual*, 7th edition:


mil.den.ber'gi.i. Mildenberg, a patronymic; M.L gen.noun *mildenbergii* of Mildenberg.

Cocccoid rods. Motile, possessing 1 to several polar flagella. Gram-negative.

Gelatin stab: Slow liquefaction. Surface growth bluish.

Agar colonies: Small, round, entire, umbonate, bluish white, spreading, becoming confluent, and forming an irregular, serrate, raised, mucoid, glistening, viscous to ropy steel blue growth. The medium becomes dark blue fluorescent. After 3 to 4 weeks, the pigment fades to blue green to green and eventually disappears.

Agar slant: Abundant, smooth or undulant, raised, moist, mucoid, glistening, viscous or ropy steel blue growth. The pigment gradually fades. The medium appears intensely blue to bluish violet and fluorescent.

Broth: Turbid with a grayish, viscid sediment and sometimes with a pellicle. The medium becomes light greenish yellow. Unpleasant odor.

Milk: Becomes weakly alkaline. No coagulation. Milk becomes blue violet to blue.

Potato: Luxuriant, slimy, glistening, raised, steel blue becoming dirty slate gray and then gray. The potato also becomes gray.

No gas from glucose.

Aerobic.

Optimal temperature, 18 to 22 C. Grows well...
TABLE 1

Histories of strains in the ARS Culture Collection which conform to the erroneous description of Pseudomonas mildenbergi found in Bergey’s Manual of Determinative Bacteriology

<table>
<thead>
<tr>
<th>NRRL No.</th>
<th>Date Received</th>
<th>Donor and Prior History</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-21</td>
<td>1940</td>
<td>L. B. Lockwood as 1064; ATCC as <em>Pseudomonas mildenbergi</em> 795; B. W. Hammer as <em>Pseudomonas cyanogena</em> from blue milk in 1913.</td>
</tr>
<tr>
<td>B-251</td>
<td>1940</td>
<td>ATCC as <em>Pseudomonas mildenbergi</em> 598—presumably another strain isolated by B. W. Hammer from blue milk in 1913.</td>
</tr>
<tr>
<td>B-252</td>
<td>1940</td>
<td>ATCC as <em>Pseudomonas mildenbergi</em> 795; B. W. Hammer as <em>P. cyanogena</em> from blue milk in 1913.</td>
</tr>
<tr>
<td>B-652</td>
<td>1946</td>
<td>R. S. Breed as <em>P. syncyanea</em>; W. C. Tobie; A. J. Kluyver (same as ATCC 9979). Reidentified as <em>P. mildenbergi</em> after receipt.</td>
</tr>
<tr>
<td>B-2159</td>
<td>1958</td>
<td>O. Lysenko as CCEB 231. Isolated from <em>Bombyx mori</em>.</td>
</tr>
<tr>
<td>B-2267</td>
<td>1959</td>
<td>A. Fuchs.</td>
</tr>
</tbody>
</table>

Aqueous solutions of the pigment turn red in the presence of strong acids, turn green in the presence of strong alkalis, and become dirty violet in weakly alkaline solutions.

Source: Air.

Habitat: Probably soil.

This corrected description of *P. mildenbergi* makes necessary its relocation in the “Key to the species of genus *Pseudomonas*,” pages 90–99 in the 7th edition of Bergey’s Manual. The name should be deleted from the key on page 92 and inserted on page 90 on the line below *Pseudomonas reptilivora*. *P. mildenbergi* fits quite well in the key at this point except that its ability to produce indole is unknown.

SUMMARY

The correct description of *Pseudomonas mildenbergi* Bergey et al., 1930, abstracted from one published by Mildenberg in 1922, is offered in a form that may be substituted for the incorrect description in *Bergey’s Manual of Determinative Bacteriology*, 7th edition (1957). In addition, the changes made necessary by this correction in the “Key to the species of genus *Pseudomonas*” are indicated.

REFERENCES

