JOURNAL OF BACTERIOLOGY, May, 1965
Vol. 89, No. 5

Encapsulated *Pseudomonas aeruginosa* (*Pseudomonas aeruginosa mucosus*) Strains

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Received for publication 18 January 1965

In *Bergey's Manual*, *Pseudomonas aeruginosa* is described as a motile, gram-negative rod (0.5 to 1.5 μ in size); no mention is made of a capsule. Most previous workers have described this microorganism as nonencapsulated. Encapsulated strains of *P. aeruginosa* are rarely encountered. Such strains were first described by Sonnenschein (Zentr. Bakteriol. Parasitenk. Abt. I Orig. **104:** 365, 1927), and then by Dahr and Kolb (Deut. Med. Wochschr. **61:**1879, 1935), Reid et al. (J. Bacteriol. **41:**94, 1941), and Henriksen (Acta Pathol. Microbiol. Scand. **25:**485, 1948).

In the course of routine work on specimens sent to our Institute between 1961 and 1963, we isolated 242 *P. aeruginosa* strains, among which 2 were observed to be encapsulated. One of these strains (633) was isolated from the sputum of a patient and the other (1440) from the urine of a different patient.

The mucoid growth potentialities of the two *P. aeruginosa* strains on different media in the early stages of isolation are shown in Table 1. They formed capsules most obviously on nutrient agar with 25% horse serum. Figure 1 shows the mucoid growth of one of the strains on this medium. Unstained areas around the rods, corresponding to the capsule, were observed (Fig. 2) on smears prepared with cultures grown on serum-supplemented medium, when smears were gram-stained or stained by the method of Jasmin (J. Bacteriol. **50:**361, 1945). When the strains were subcultured serially, they lost their capsule-forming ability. However, they grew and formed capsules when freeze-dried cultures kept at room temperature for 26 and 7 months were subcultured on nutrient agar with serum.

TABLE 1. *Mucoid growth of the two encapsulated Pseudomonas aeruginosa strains in different media in the early stages of isolation*

Medium (in petri dishes)	Strain	
	1440	633
Nutrient agar (20 ml)	++*	++
Chocolate-agar (20 ml)	++	++
Blood-agar (20 ml; 5% rabbit erythrocytes)	+++	+++
Nutrient agar (18 ml) plus horse serum (2 ml)	++	++
Nutrient agar (16 ml) plus horse serum (4 ml)	+++	+++
Nutrient agar (15 ml) plus horse serum (5 ml)	++++	++++
Nutrient agar (14 ml) plus horse serum (6 ml)	++++	++++
Nutrient agar (15 ml) plus calf serum (5 ml)	+++	+++
Nutrient agar (15 ml) plus human serum (5 ml)	+++	+++
Nutrient agar (15 ml) plus human ascitic fluid (5 ml)	+++	+++

* Plus signs show the degree of mucoid growth.

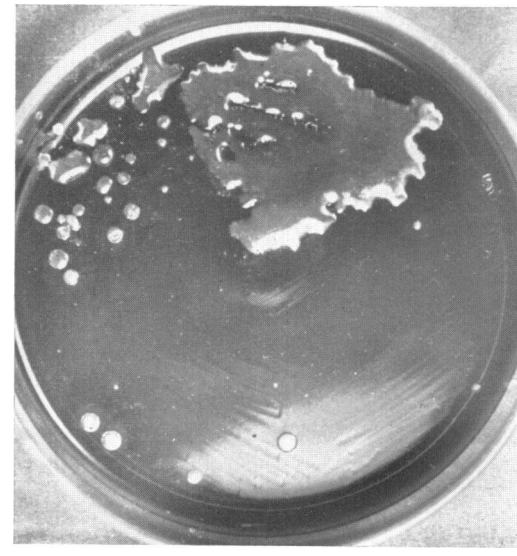

FIG. 1. *Mucoid growth of encapsulated Pseudomonas aeruginosa 1440 on nutrient agar medium containing 25% horse serum.*

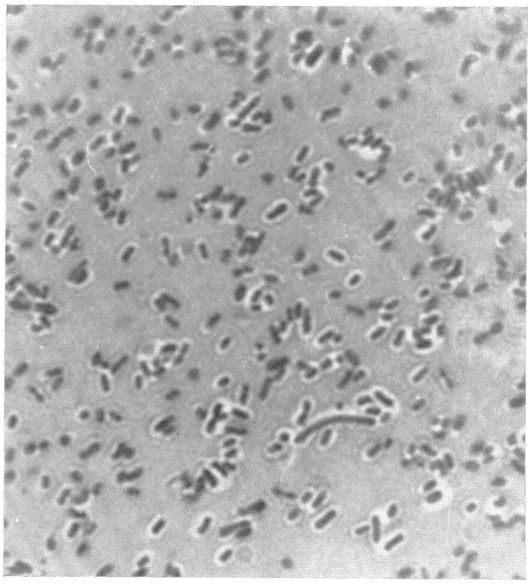

FIG. 2. *Bacteria on a smear prepared from the culture of encapsulated Pseudomonas aeruginosa 1440 and stained by the Jasmin method.*

We failed to show an additional antigen in encapsulated *P. aeruginosa* strains other than those found in their nonencapsulated variants. No difference was observed between biochemical activity of encapsulated strains and of their nonencapsulated variants. One of the encapsulated strains was found to be more pathogenic for mice than its nonencapsulated variant. No difference was observed between the effects of antibiotics on the encapsulated strains and their nonencapsulated variants.