Biochemical and Serological Characteristics of a
Yersinia enterocolitica Isolate

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Yersinia enterocolitica was isolated from human mesenteric lymph nodes. Its morphological characteristics and biochemical and serological reactions are described.

Although long known as an animal pathogen, Yersinia enterocolitica has only recently been recognized in clinically significant human infections. Over two hundred cases have been cited in the world literature, but there have been few isolations in the United States. This organism is an etiological agent of mesenteric lymphadenitis, and its biochemical characteristics have been reported by Jansson, Wallgren, and Ahrvonen (1), examined, and then reincubated for an additional 24 hr. A single colony (0.5 mm, nonhemolytic, convex, smooth, glistening, translucent grey with a beaten copper appearance) appeared on both the CO₂ and anaerobic blood-agar plate.

The distinctive characteristic of temperature-dependent motility was observed in thioglycolate broth. Broth incubated at 27 C showed diffuse growth with active motility, whereas at 37 C growth appeared as isolated clumps and no motility was observed. A Gram stain of the lymph node showed rare gram-negative cocccobacilli, whereas Gram stains from cultural media revealed the characteristic pleomorphic forms: from the blood-agar plate a small (0.8 to 1.2 μm) cocccobacillary, gram-negative rod with bipolar staining, and from the thioglycolate broth a larger (3 to 5 μm) gram-negative rod with uneven staining.

Table 1 shows the series of biochemical tests
performed. The organism was differentiated from *Y. pseudotuberculosis* by indole and acetyl methyl carbinol (Voges-Proskauer) production, ornithine decarboxylation, sucrose fermentation, and failure to ferment rhamnose. The isolate was identified as *Y. enterocolitica* similar to biotype II of Niléhn on the basis of inability to ferment salicin, production of acid from xylose, and production of indole.

To confirm serologically the identification, a soluble extract was prepared for the precipitin test by autoclaving the 0.85% saline-suspended growth from three blood-agar plates incubated for 48 hr at 27 C. All *Y. pseudotuberculosis* antisera, *Y. enterocolitica* P-76, and *Y. enterocolitica* P-71 were negative. However, the extract reacted (1:8,192) with anti-*Y. enterocolitica* 33114. This organism was originally isolated by the New York State Department of Health and was the first reported North American isolate (4).

Table 2 shows the results of agglutination tests performed on the serum of a patient taken at different stages of his illness. The antigen preparation consisted of a Formalin-killed saline suspension of *Y. enterocolitica* from a blood-agar plate incubated at 27 C. The turbidity of the suspension was adjusted to match a McFarland nephelometer no. 1 standard. The tube agglutination test was incubated in a water bath at 50 C for 18 hr. A rapid increase in titer can be seen followed by a loss of specific antibody within 2 months. This specific antibody response by the patient to the *Yersinia* infection is diagnostic.

Disc-diffusion antibiotic sensitivity tests showed this organism to be sensitive to ampicillin, chloramphenicol, colistin, sulfasoxazole, kanamycin, streptomycin, tetracycline, and gentamycin.

*Y. enterocolitica* is a readily identifiable but seldom reported bacterium of clinical significance. It is similar morphologically and biochemically to *Y. pseudotuberculosis* but appears to be antigenically distinct.

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**LITERATURE CITED**