

## *Cedecea davisae* Bacteremia

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Received 12 December 1985/Accepted 26 June 1986

**A case of bacteremia caused by *Cedecea davisae* is presented. This is the first reported case of bacteremia caused by this organism.**

The name *Cedecea* was proposed in 1980 for a new genus, in the family *Enterobacteriaceae*, formerly designated as CDC Enteric Group 15 (J. J. Farmer III, P. A. D. Grimont, F. Grimont, and M. A. Asbury, *Abstr. Annu. Meet. Am. Soc. Microbiol.* 1980, C123, p. 295). The genus *Cedecea* is phenotypically distinct from other genera in the family *Enterobacteriaceae*. Like *Serratia* cultures, *Cedecea* cultures are lipase positive and resistant to colistin and cephalothin. Unlike *Serratia* strains, *Cedecea* strains do not hydrolyze gelatin or DNA. Seventeen isolates of the species designated as *Cedecea davisae* have previously been reported (1). Sputum was the most common source. Other sources included a gall bladder, hand wounds, and an eye swab from a 4-day-old infant. None of the 17 strains was isolated from blood or spinal fluid. A literature search revealed no reports of a prior isolation of *C. davisae* from blood. In 1982, Farmer and co-workers reported a case of bacteremia caused by a species of *Cedecea* designated as *Cedecea neteri* (2).

**Case report.** A 70-year-old female with a history of heart disease was admitted to McLaren General Hospital, Flint, Mich., on 22 February 1985 because of bronchitis and chronic obstructive pulmonary disease (COPD). On hospital day 4, *Staphylococcus aureus* was isolated from three blood cultures. The patient was started on nafcillin and responded well to this therapy. She experienced no further febrile episodes or any other overt signs or symptoms of infection until hospital day 22.

Precipitous drops in hemoglobin and platelet counts were noted on hospital day 22. During hospital days 23 and 24, the patient experienced an episode characteristic of disseminated intravascular coagulation (DIC). However, three blood culture sets were negative except for one bottle which grew coagulase-negative staphylococci. The patient received many units of packed erythrocytes and platelets in an effort to control the DIC. No further cultures were submitted at this time, and no cause of the DIC was determined.

On hospital day 25, three sets of blood cultures, each set consisting of an aerobic bottle and an anaerobic bottle (BACTEC bottles; Johnston Laboratories, Inc., Towson, Md.) were obtained. Within 24 h, two of the aerobic bottles became positive, one with *Staphylococcus epidermidis* and the other with a group D streptococcus, an enterococcus, and a gram-negative rod. The gram-negative organism had a biochemical profile number of 3105121 when tested by the API 20E system (Analytab Products, Plainview, N.Y.). According to the API profile index, the organism was classified as a *Cedecea* species. Biochemical tests were done immediately to identify the organism to the species level.

The gram-negative rod was lipase positive, DNase and gelatin negative, and resistant to cephalothin and colistin. It did not grow in media without thiamine (1). The organism was positive for malonate utilization, ornithine decarbox-

TABLE 1. Biochemical reactions of the McLaren General Hospital *C. davisae* isolate

Test	Reaction after 2 days of incubation at 36°C
Indole production	-
Voges-Proskauer	+
Citrate (Simmons) utilization	+
H <sub>2</sub> S production (triple sugar iron agar)	-
Urea (Christensen)	-
Phenylalanine deaminase	-
Lysine decarboxylase (Moeller)	-
Arginine dihydrolase (Moeller)	+
Ornithine decarboxylase (Moeller)	+
Motility	+
Gelatin hydrolysis at 22°C	-
Growth in KCN	+
Malonate utilization	+
Acid production from:	
Glucose	+
Lactose	+
Sucrose	+
Mannitol	+
Dulcitol	-
Salicin	+
Adonitol	-
Inositol	-
Sorbitol	-
Arabinose	-
Raffinose	-
Rhamnose	-
Maltose	+
Xylose	+
Trehalose	+
Cellobiose	+
Melibiose	-
Glycerol	-
Mannose	+
Mucic acid production	-
Tartrate (Jordan)	-
Acetate utilization	-
Esculin hydrolysis	+
Lipase	+
DNase at 25°C	-
Reduction of nitrate to nitrite	+
Oxidase	-
<i>o</i> -Nitrophenyl-β-D-galactopyranoside	+
Pigment production	-
Growth in media without thiamine	-

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ylase (Moeller), arginine dihydrolase (Moeller), and the Voges-Proskauer test. Multiple biochemical tests were done subsequently at McLaren General Hospital to confirm the identification of the organism (Table 1). The organism was also sent to the Centers for Disease Control (CDC), where it was confirmed as *C. davisae*. The organism was susceptible, as determined by MIC testing (Micro-Media Systems, Inc., Potomac, Md.), to amikacin, carbenicillin, gentamicin, tobramycin, cefotaxime, cefoperazone, piperacillin, and tetracycline (moderately so) but was resistant to ceftiofur, ampicillin, and cephalothin.

On hospital day 26, a central venous pressure catheter tip and a Swan-Ganz tip were submitted to the laboratory for culturing. Both specimens grew large numbers of *S. epidermidis* and *C. davisae*. Three sets of blood cultures, each set consisting of a resin bottle and an anaerobic bottle, were obtained on day 26. Resin bottles were used because the patient was receiving antibiotics. All three resin bottles and two of the three anaerobic bottles were positive within 24 h for *C. davisae*. *C. davisae* was also recovered in small numbers from sputum cultures obtained on days 25 and 26. The patient was started on mezlocillin, gentamicin, and clindamycin. The platelet count stabilized without further infusion of blood products.

This was the first and only documented case of *C. davisae* at our hospital. The fact that we have not found this organism previously despite close monitoring of tracheal sites in the ward this patient was in may indicate that it was acquired from the patient's own flora and not the hospital environment, although this infection still meets the criteria for nosocomial infections. However, we cannot rule out

contamination from other sources. Some of the evidence suggests that the contaminated central venous pressure catheter and Swan-Ganz lines may have been the foci of the infection. Both *S. epidermidis* and *C. davisae* were isolated in large numbers from the tips, and both organisms were recovered from the blood during the acute phase of the illness. The patient's recovery was dramatic when these lines were removed and appropriate antibiotic therapy for *C. davisae* was begun. The patient was carrying the organism in her sputum at the time of the bacteremia, but the clinical picture did not suggest pneumonia. She was still colonized 4 weeks after the acute phase of the illness. Perhaps the arterial line became contaminated via an oral or hand route and thus set the stage for the bacteremia.

This case represents the first known report of *C. davisae* bacteremia.

We thank R. Sturm for reviewing the clinical aspects of this case and the manuscript.

#### LITERATURE CITED

1. Farmer, J. J., III, B. R. Davis, F. W. Hickman-Brenner, A. McWhorter, G. P. Huntley-Carter, M. A. Asbury, C. Riddle, H. G. Wathen-Grady, C. Elias, G. R. Fanning, A. G. Steigerwalt, C. M. O'Hara, G. K. Morris, P. B. Smith, and D. J. Brenner. 1985. Biochemical identification of new species and biogroups of *Enterobacteriaceae* isolated from clinical specimens. *J. Clin. Microbiol.* **21**:46-76.
2. Farmer, J. J., III, N. K. Sheth, J. A. Hudzinski, H. D. Rose, and M. F. Asbury. 1982. Bacteremia due to *Cedecea neteri*. *J. Clin. Microbiol.* **16**:775-778.