

## Probable *Campylobacter fetus* subsp. *fetus* Gastroenteritis

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Three strains of *Campylobacter fetus* subsp. *fetus* isolated from cases of gastroenteritis are reported. DNA-DNA hybridizations in addition to biochemical tests were used to confirm the identification of the isolates as *C. fetus* since all strains grew at 42°C. These isolates, like other *C. fetus* strains, are susceptible to cephalothin and thus would not have been detected in laboratories with *Campylobacter* isolation media containing this component.

It is generally agreed that *Campylobacter jejuni* is a leading cause of enteritis in humans, whereas *Campylobacter fetus* subsp. *fetus* rarely, if ever, causes enteritis and is primarily an opportunistic pathogen capable of causing systemic illness in debilitated or immunosuppressed patients. We report here on three strains of *C. fetus* recently isolated from fecal specimens of individuals with gastroenteritis. All patients were young adult males with no history of underlying disease and whose predominant complaint was crampy abdominal pain with intermittent bloody stools. A culture of feces from all three individuals on the routine enterobacterial media yielded no pathogens. In addition, tests for ova and parasites were negative.

The three strains were isolated in three different laboratories in diverse geographical locations of southern California, and the media and methods were not identical. The one consistent feature was that all laboratories used a *Campylobacter* isolation medium which did not contain cephalothin. Two laboratories used *Campylobacter* agar (Anaerobe Systems, Santa Clara, Calif.) and the third used a *Campylobacter* agar manufactured by Callabs (California Laboratories Industries, North Hollywood, Calif.). Both media employed combinations of vancomycin, trimethoprim, and polymyxin as the basis for selectivity. Two of the laboratories routinely incubated their primary *Campylobacter* plates at 42°C in a GasPak jar with a Campy Pak envelope (BBL Microbiology Systems, Cockeysville, Md.). The third laboratory incubated *Campylobacter* plates at 35°C in a GasPak jar with the GasPak envelope but without a catalyst. All three laboratories isolate *C. jejuni* from diarrheal feces at an incidence comparable or exceeding that of *Salmonella* spp.; none had

previously reported the isolation of a *C. fetus*-like organism from feces.

Identification of the strains as *C. fetus* was by biochemical tests and DNA-DNA hybridizations. Methods were those described by Harvey and Greenwood (3), except for the oxidase and hippurate tests which were performed with commercially available diagnostics (Clinical Standards Laboratory, Carson, Calif.). All three strains were tested on the battery of biochemicals (Table 1), but only the first isolate was confirmed by DNA-DNA hybridizations (Table 2).

All strains conform to the expected profile for *C. fetus* subsp. *fetus* with the exception of growth at 42°C. Although *C. fetus* subsp. *fetus* strains which are capable of growth at 42°C have been noted before (2, 4), it is considered a rare, but not inconsistent, feature. The DNA-DNA hybridizations confirmed the validity of this profile identification for isolate number 1. As Table 2 illustrates, the DNA from isolate number 1 was 98.8% related to that from the type strain of *C. fetus* subsp. *fetus* and less than 6.8% related to the DNA from the representative strains of the other *Campylobacter* species and *Campylobacter*-like organisms.

In 1979, Butzler and Skirrow (1) reported that in a survey of 22,000 stools for *Campylobacter* species, *C. fetus* was found in only three of the samples, and there was no association with gastroenteritis. Because of this extensive work in Belgium, most laboratories discount the possibility of isolating *C. fetus* from fecal specimens. Therefore, many of the commercially available *Campylobacter* isolation media contain cephalothin, an antibiotic which inhibits the growth of *C. fetus* strains but allows the growth of *C. jejuni* strains. In addition, most labora-

TABLE 1. Results of phenotypic tests

Strain	Oxidase	Catalase	Hippurate hydrolysis	Diam of inhibition zone (mm)		Growth at:			Growth in 1% glycine <sup>a</sup>	Growth in 3.5% NaCl <sup>a</sup>
				Nalidixic acid	Cephalothin	25°C	35°C	42°C		
C-135	+	+	-	- <sup>b</sup>	18	+	+	+	+	-
C-140	+	+	-	-	19	+	+	+	+(-)	-
C-142	+	+	-	-	20	+	+	+	+	-

<sup>a</sup> Tests were terminated after 5 days of incubation at 35°C. For each test, two basal media were used: fluid thioglycollate (Difco Laboratories, Detroit, Mich.), and *Brucella* broth (Difco) containing 0.16% agar. If test results differed, the test result with *Brucella* broth basal is given in parentheses.

<sup>b</sup> -, No zone of inhibition.

tories incubate *Campylobacter* selective media at 42°C, a temperature which enhances the growth of *C. jejuni* but which inhibits the growth of most strains of *C. fetus*. Unless laboratories

modify their *Campylobacter* isolation techniques to encompass the growth requirements of *C. fetus* as well as those of *C. jejuni*, it will remain impossible to adequately assess the relative frequency of *C. fetus*-associated gastroenteritis in this country. As with *Yersinia enterocolitica*, statistics for Belgium are not necessarily valid for the United States.

TABLE 2. DNA relatedness values between *Campylobacter* reference strains and thermophilic *Campylobacter* C-135

Reference DNA from strain:	% Relatedness to strain C-135
C-16, <i>C. fetus</i> subsp. <i>fetus</i> ATCC 27374 .....	98.8
C-61, <i>C. jejuni</i> ATCC 29428 .....	5.7
C-38, <i>C. coli</i> Butzler P2 .....	4.5
C-32, " <i>C. fecalis</i> " Firehammer 14227A .....	4.5
C-133, NARTC <sup>a</sup> NCTC 11352 .....	4.3

<sup>a</sup> NARTC, Nalidixic acid-resistant thermophilic *Campylobacter* spp.

## LITERATURE CITED

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