NOTE

Prevalence of *Campylobacter jejuni* in Feral Pigeons

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Campylobacter jejuni is now recognized as an important cause of acute bacterial enteritis in man. Since the first outbreak of acute enteritis due to this organism in Japan was reported by Itoh *et al.* [5] in 1980, many outbreaks with a frequency rivaling that of salmonellosis have been reported [4]. The source of human infection, however, has not been fully elucidated. *C. jejuni* is frequently found in the feces of such domestic animals as poultry, pigs, sheep and cattle [4, 11], and raw foods of animal origin have been implicated in outbreaks of campylobacter enteritis [1, 6, 7, 10]. Pet animals are also possible vehicles of transmission [2, 8, 11, 12]. It is most probable that there are different sources of human infection.

The purpose of the present study was to determine the frequency of *C. jejuni* in feral pigeons and also to discuss whether the bird serves as a potential source of *C. jejuni* infection in man.

The specimens tested were obtained from 329 pigeons inhabiting public parks, shrines and storehouses of animal feeds in eight localities in three prefectures of Central Japan. Of these specimens, 196 were obtained from rectal contents of apparently healthy pigeons shortly after the birds had been sacrificed for other purposes in Laboratory of Veterinary Microbiology. These pigeons

were captured between June and August, 1982. The other 133 samples were collected from fresh droppings with sterile cotton swabs in March, 1983. The swab was put into a tube containing 0.5 ml of heart infusion broth and transported to the laboratory within 2 h in an ice box. The fecal specimens were plated directly on Skirrow's medium supplemented with 7% lysed and defibrinated horse blood. The inoculated plates were incubated at 37°C for 48 h in a micro-aerophilic atmosphere.

Colonies suspected of those of *C. jejuni* were checked microscopically for typical comma or spiral shaped bacilli and then subcultured in differential media for biochemical tests [9, 13]. These tests included positive catalase and oxidase reactions, growth at 37 and 42°C but no growth at 25°C, growth in 1% glycine, negative glucose fermentation or oxidation, production of hydrogen sulfide as detected with lead acetate paper, sensitivity to nalidixic acid (30 µg/ml) and positive hippurate hydrolysis.

All specimens were examined also for *Salmonella* and *Yersinia* by standard direct plating and enrichment methods.

As shown in Table 1, *C. jejuni* was isolated from 54 (27.6%) pigeons out of 196 in 1982 and from 24 (18.0%) of 133 in 1983. As a whole, 23.7% (78/329) of

Table 1. Isolation of *Campylobacter jejuni* from rectal contents or fresh droppings of feral pigeons

Localities	Tested in 1982*			Tested in 1983*		
	Number of of pigeons		Percent positive	Number of pigeons		Percent positive
	Tested	Positive		Tested	Positive	
Aichi Prefecture						
Anjo	2	1	50.0	—**	—	—
Yatomi	21	5	23.8	—	—	—
Tokai	72	27	37.5	—	—	—
Gamagori	3	1	33.3	—	—	—
Chita	56	1	1.8	40	8	20.0
Nagoya	2	0	0	33	7	21.2
Mie Prefecture						
Kameyama	40	19	47.5	—	—	—
Gifu Prefecture						
Gifu	—	—	—	60	9	15.0
Total	196	54	27.6	133	24	18.0

* The specimens were obtained from rectal contents of captured pigeons at necropsy in 1982, and from fresh droppings in 1983.

** Not tested.

all pigeons were demonstrated to carry *C. jejuni*. Besides, *C. coli* was also isolated from three pigeons captured at Yatomi in 1982. However, no nalidixic acid-resistant thermophilic *Campylobacter* was isolated. The number of *C. jejuni* ranged from 6.0×10^2 to 8.0×10^6 /g of feces of 22 positive pigeons with a mean number of 9.5×10^5 /g.

The rate of isolation of *C. jejuni* apparently varied depending upon the area and the time of sampling, possibly due to one or more of the followings: different sample sizes, sampling methods and pigeon flocks from different localities.

On the other hand, no *Yersinia* spp. was isolated by the cold enrichment method from the same specimens; *Salmonella* spp. were isolated from only two specimens (0.6%) with selenite broth enrichment media. All isolates were identified as *S. typhimurium* subserovar *copenhagen*.

Only a few reports concerning the prevalence of *Campylobacter* in pigeons have

been published. Fenlon [3] and Weber *et al.* [15] reported high carrier rates of 50 and 54.9%, respectively. In Japan, Itoh *et al.* (1982) reported at the 94th Annual Meeting of the Japanese Society of Veterinary Science that 12.5% of feral pigeons carried *C. jejuni*; subsequently, at the 95th Annual Meeting, Fukuyama *et al.* (1983) reported that 13.2% of the pigeons excreted this organism. The present and other investigations suggest that *C. jejuni* is common in the intestinal flora of pigeons and also that pigeons probably constitute a natural reservoir of *C. jejuni*. To determine whether or not the strains from pigeons are pathogenic for man, further studies involving comparison of human and pigeon strains in the pathogenicity and antigenic properties are required, though at present no internationally uniform method for serotyping this species has been established. Since *C. jejuni* survives poorly outside the body unless protected from desiccation and contact with atmospheric oxygen

[14], it is unlikely that the organism in pigeon feces serve as a direct source of human infection. However, the pigeons living in parks and shrines have many chances of contact with man, especially children with high susceptibilities to the organism, and more work is necessary to clarify the epidemiological significance of pigeons in human campylobacter infection.

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要 約

ドバトにおける *Campylobacter jejuni* の分布 (短報) : 金城俊夫・森重正幸・源 宣之・福士秀人* (岐阜大学農学部獣医公衆衛生学教室, *家畜微生物学教室) —— 中部3県の8地域の公園, 神社, 飼料倉庫等に生息するドバトの糞から Skirrow 培地による直接培養で *C. jejuni* の分離を試みた。1982年には捕獲ドバト196羽の剖検時直腸便のうち54羽27.6%から, 1983年には133羽の新鮮排泄便のうち24例18.0%から, また総計では23.7%から該菌を分離した。一方, *Salmonella typhimurium* が僅か0.6%から分離されたが, *Yersinia* は全く検出できなかった。