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BRIEF COMMUNICATION

THERMOTOLERANT *Campylobacter* SPECIES ISOLATED FROM PSITTACIFORMES IN THE PERUVIAN AMAZON REGION

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In the last years, the thermotolerant campylobacters (*C. jejuni* subsp. *jejuni*, *C. coli* and *C. lari*) have acquired a great importance in public health, specially as agents of human diarrheal disease[1,5].

These zoonotic bacteria are carried in the intestinal tract of a wide variety of wild and domestic animals and, as result of fecal contact during processing, frequently contaminate foods derived from animals[12,14]. There is evidence to indicate that poultry and, to a lesser extent, pets (especially kittens and puppies) are important reservoirs of *Campylobacter* and principal vehicles of campylobacteriosis[2].

Frequently, in Iquitos (eastern Peru), parrots (Psittaciformes) captured from the jungle, are bred by families as pets, especially in the peri-urban zones. Since the sources from which humans acquire the campylobacteriosis, are only partially known, in this study, we determined the frequency of carriage of thermotolerant campylobacters in wild Psittaciformes.

Fecal samples were obtained by cloacal swabs from 142 wild parrots in different peripheric zones of Iquitos city (in the Peruvian Amazon region, Southern latitude 3°45'). The animals were caught in the jungle, sampled and then released.

All samples were immediately placed into the transport and enrichment medium proposed by FERNANDEZ[4], consisting of (wt/vol): *Brucella* broth (Difco) 2.8 g%; agar - agar (Difco) 0.15 g%; ferrous sulphate (Merck) 0.05 g%, sodium metabisulfite (Merck) 0.05 g%; sodium pyruvate (Merck) 0.05 g%, trimethoprim (Sigma) 1 mg%; rifampicin (Sigma) 1.5 mg%; colistin (Sigma) 1000 IU%; amphotericine (Squibb) 1 mg% and defibrinated horse blood 3 ml%. After that, they were streaked onto modified SKIRROW plates[12] consisting of (wt/vol): *Brucella* agar (Difco) 4.3 g%; ferrous sulphate (Merck) 0.05 g%, sodium metabisulfite (Merck) 0.05 g%; sodium piruvate (Merck) 0.05 g%, vancomicin (Sigma) 1 mg%; trimethoprim (Sigma) 0.5 mg%; polimixin B 250 IU%; cephalotin 1 mg%; amphotericine (Squibb) 0.1 mg% and defibrinated horse blood 5 ml%. The plates were incubated at 42°C for 48 h in an atmosphere of 5% O_2 - 10% CO_2 and 85% N_2.

Suspected colonies were identified morphologically (Gram stain) and biochemical characterization of the isolates was done using the differential tests proposed by LIOR[9] and GOOSSENS & BUTZLER[6]: catalase and oxidase tests, growth conditions, susceptibility to nalidixic acid (30μg), hippurate hydrolisis, rapid H_2S production and DNA hydrolisis.

The results obtained show that 10/142 (7.0%) of the wild parrots studied yielded thermotolerant campylobacters (Table 1). This value is lower than that reported by MAGGI et al. in Chile (8.3%) who determined the prevalence of *Campylobacter* in caretakers and animals from the Santiago zoo[11].

On the other hand, this isolation rate is slightly lower than that reported by TRESIERRA-AYALA et al. [13] in domestic parrots from this peruvian region (8.0%); however, our results suggest that these birds may be important reservoirs of campylobacters.

These bacteria were not isolated from *Aratinga weddellii, Amazona amazonica* and *Ara manilata.*

C. jejuni subsp. *jejuni* was the most frequent of isolated species; in contrast, *C. lari* was not isolated from these birds. Only biovars I and II of *C. jejuni* subsp. *jejuni* and *C. coli* were found.

C. jejuni subsp. *jejuni* biovar I was isolated from all the species of parrots under study but not in *Aratinga weddellii, Amazona amazonica* and *Ara manilata*, being the most prevalent biovar in these birds.

LUECHTEFELD et al.[10] and KAPPERUD & ROSEF[8] were some of the first investigators to document the isolation of these organisms from wild birds. LUECHTEFELD et al.[10] reported an isolation rate of *Campylobacter* spp. from aproximately one-third of the migratory birds from which they took samples.

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TABLE 1
Distribution of the biovars of *C. jejuni* subsp. *jejuni* and *C. coli*, isolated from wild parrots studied

Parrots	n	*C. jejuni* subsp. *jejuni*		*C. coli*		TOTAL
		I	II	I	II	
Pionites melanocephala	25	1(4.0)	1(4.0)	0(0.0)	1(4.0)	3(12.0)
Brotogeris versicolurus	17	1(5.9)	0(0.0)	0(0.0)	1(5.9)	2(11.8)
Ara ararauna	10	1(10.0)	0(0.0)	0(0.0)	0(0.0)	1(10.0)
Brotogeris cyanoptera	33	2(6.1)	0(0.0)	1(3.0)	0(0.0)	3(9.1)
Ara macao	13	1(7.7)	0(0.0)	0(0.0)	0(0.0)	1(7.7)
Aratinga weddellii	24	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Amazona amazonica	12	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Ara manilata	8	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
TOTAL	142	6(4.2)	1(0.7)	1(0.7)	2(1.4)	10(7.0)

( ): %

KAPPERUD & ROSEF [8] reported high isolation rates of *C. jejuni* from crows, gulls, and domestic pigeons. They concluded that campylobacters are a normal component of the intestinal flora in several bird species. At the other side of the spectrum, HILL and GRIMES [7] documented the absence of *C. jejuni* from waterfowl on Lake Onalaska, Wis. They suggested that the distribution of the organism among migratory waterfowl was sporadic. It is probably that the relative high body temperature of birds may favor the growth of thermotolerant campylobacters and due to their great mobility, wild birds can live near man and may function as effective sources of contamination, through fecal excrements, of pastures, forage and surface waters.

The epidemiology of the campylobacteriosis is still not completely understood. At present, we do not know the extent to which human infections are derived from animals, so, it would be important to do more studies for clarifying the epidemiology of human campylobacteriosis that seems to be a very complex problem in the peruvian jungle.

RESUMO

Espécies de *Campylobacter* termotolerantes isolados de Psittaciformes silvestres na região amazônica do Peru.

Foi determinada a freqüência de isolamento de campylobacters termotolerantes em Psittaciformes silvestres capturados na região amazônica do Peru. Campylobacters foram isolados em 10/142 (7.0%) dos animais estudados, sendo *C. jejuni* subsp. *jejuni* biovar I (6/10) o mais freqüente, seguido de *C. coli* biovar II (2/10), *C. lari* não foi isolado. Os resultados sugerem que estas aves podem ser importantes reservatórios destas bactérias.

REFERENCES

1. BLASER, M.J.; TAYLOR, D.N. & FELDMAN, R.A.- Epidemiology of *Campylobacter jejuni* infections. **Epidem. Rev., 5**: 157-176, 1983.

2. DEMING, M.S.; TAUXE, R.V.; BLAKE, P.A. et al.- *Campylobacter* enteritis at a university: transmission from eating chicken and from cats. **Amer. J. Epidem., 126:** 526-534, 1987.

3. FERNANDEZ, H. - **Thermophylic species of *Campylobacter*: bacteriological, epidemiological and pathogenical aspects**. São Paulo, 1983. (Doctoral Thesis-School of Medicine, University of São Paulo).

4. FERNANDEZ, H.- Increase of *Campylobacter* isolation rates using an enrichment medium. **Rev. Microbiol. (S. Paulo), 23:** 5-7, 1992.

5. FERNANDEZ, H.- Thermotolerant *Campylobacter* species associated with human diarrhea in Latin America. **Cienc. e Cult., 44:** 39-43, 1992.

6. GOOSSENS, H. & BUTZLER, J.P.- Isolation and identification of *Campylobacter* spp. **In:** NACHAMKIN, I.; BLASER, J.M. & TOMPKINS, L.S., ed. ***Campylobacter jejuni*: current status and future trends**. Washington, American Society for Microbiology, 1992. p. 300.

7. HILL, G.A. & GRIMES, D.J.- Seasonal study of a freshwater lake and migratory waterfowl for *Campylobacter jejuni*. **Canad. J. Microbiol., 30:** 845-849, 1984.

8. KAPPERUD, G. & ROSEF, O.- Avian wildlife reservoir of *Campylobacter fetus* subsp. *jejuni, Yersinia* spp. and *Salmonella* spp., in Norway. **Appl. environ. Microbiol., 45:** 375-380, 1983.

9. LIOR, H.- New, extended biotyping scheme for *Campylobacter jejuni, Campylobacter coli* and "*Campylobacter laridis*". **J. clin. Microbiol., 20:** 636-640, 1984.

10. LUECHTEFELD, N.A.; BLASER, M.J.; RELLER, L.B. & WANG, W.L.L.- Isolation of *Campylobacter fetus* subsp. *jejuni* from migratory water-fowl. **J. clin. Microbiol., 12:** 406-408, 1980.

11. MAGGI, L.; MARTINEZ, J.; PRADO, V.; GONZALEZ, L. & RIVEROS, V.- Prevalence of *Campylobacter jejuni/coli* in caretakers and animals from the Santiago zoo. **Rev. méd. Chile, 116:** 7-12, 1988.

12. SKIRROW, M.B.- *Campylobacter* enteritis: a "new" disease. **Brit. med. J., 2:** 9-11, 1977.

13. TRESIERRA-AYALA, A.; BENDAYAN, M.E.; BERNUY, A.; ESPINOZA, F. & FERNANDEZ, H.- Carriage of the classical thermotolerant campylobacters in healthy domestic animals from Eastern Peru. **Rev. Inst.Med. trop. S. Paulo, 37:** 537-539, 1995.

14. TRESIERRA-AYALA, A. & FERNANDEZ, H.- Occurrence of thermotolerant *Campylobacter* species in domestic and wild monkeys from Peru. **Zbl. Vet. Med. (B), 44:** 61-64, 1997.

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