

**TITLE:** ARCOBACTER SPP. PATHOGENIC SPECIES OF AVIAN ORIGIN: PHENOTYPIC CHARACTERIZATION AND INTERACTION WITH HOST

**AUTHORS:** OLIVEIRA, M.G.X; VIEIRA, M.A.M.; MESQUITA, R. G.; FONSECA, J.G.S.; MOREIRA, N.; SANCHES, A.A.; MATTOS, M; AMARAL, T.A.T.G.; GOMES, C.O.M.S.; MORENO, A.M; KNÖBL, T.

**INSTITUTION:** FACULDADE DE MEDICINA VETERINÁRIA E ZOOTECNIA da USP, São Paulo, SP (Av. Prof. Orlando Marques de Paiva, 87 - Butantã, 05508-010 São Paulo – SP, Brazil); CENTRO UNIVERSITÁRIO FMU (Rua Ministro Nélon Hungria, 541 - Vila Tramontano, São Paulo - SP, 05690-050); ESCOLA PAULISTA DE MEDICINA – UNIFESP (R. Botucatu, 720 - Vila Clementino, São Paulo - SP, 04023-062, Brazil).

**ABSTRACT:**

*Arcobacter* is a pathogen involved in foodborne diseases which is frequently isolated from foods of animal origin. The objective of the present study was to evaluate the *in vitro* and *in vivo* interaction of *Arcobacter butzleri* and *Arcobacter cryarophilus* of avian origin. Four virulent strains of *Arcobacter* spp. obtained from poultry meat sold in the city of São Paulo were used in this study. *In vitro* analysis demonstrated that the strains presented low ability to form biofilms. In HeLa cell adhesion tests, strains showed low to moderate intensity adhesion, and only one strain did not show ability to adhere. All strains tested were cytotoxic to VERO cells, causing elongation and rounding of the cytoplasm and vacuolization. *In vivo* tests included inoculation of SPF birds and the ligated rabbit intestinal loop model. The rabbit model showed accumulation of liquid and intense hemorrhage 12 hours after inoculation, with diffuse edema in the lamina propria and submucosa, ectasia of lymph vessels, and mixed inflammatory infiltrate. The intestinal lumen showed red cells associated with cell debris. Thirty birds (divided into 5 groups) were challenged. Animals were inoculated by gavage with 0.1 mL of culture  $1.0 \times 10^9$  CFU/mL *A. butzleri*, *A. cryarophilus*. Macroscopic changes observed upon *post-mortem* examination showed different lesion patterns, including hyperemia of the small intestines, gas formation in intestinal loops, and pale organs. Live birds showed only slight diarrhea without other apparent clinical manifestations. Histology analysis showed intense inflammation of small intestines with reduced villus height. Immunological analysis was based on genes that encode IFN- $\alpha$ , IL-1, IL-10, and  $\beta$ -actin measured by real time PCR in cecal tonsils and spleen of the birds. Challenged animals did not show inflammatory reaction in spleen cells. Tonsils showed increased expression of the proinflammatory cytokines IL-1 and INF  $\alpha$ . Similar results for the expression of cytokines IFN- $\gamma$ , TNF, IL-6, and MCP-1 were observed in studies involving gnotobiotic rats challenged with *E. coli*, *Campylobacter jejuni*, and *Arcobacter butzleri*. Data obtained in the present study suggest that *Arcobacter* spp. is more than a commensal in vertebrate hosts, indicating the pathogenic potential and risk of foodborne transmission of these bacteria.

**Keywords:** diarrhea, diseases of poultry, pathogenic bacteria, *Arcobacter*, foodborne transmission.

**Development Agency:** Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)