

Editorial

***Corresponding author**
Harry Hariharan, DVM, PhD
 Department of Pathobiology
 St. George's University School of
 Veterinary Medicine
 Grenada, West Indies
 Tel. +1-473-444-4175
 Fax: +1-473-439-5068
 E-mail: hhariharan@squ.edu

Volume 1 : Issue 2

Article Ref. #: 1000VMOJ1e002

Article History

Received: August 22nd, 2016

Accepted: August 22nd, 2016

Published: August 23rd, 2016

Citation

Hariharan H. Observations on emerging zoonotic enteric bacterial pathogens. *Vet Med Open J*. 2016; 1(2): e3-e4. doi: [10.17140/VMOJ-1-e002](https://doi.org/10.17140/VMOJ-1-e002)

Copyright

©2016 Hariharan H. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Observations on Emerging Zoonotic Enteric Bacterial Pathogens

Harry Hariharan, DVM, PhD*

Department of Pathobiology, St. George's University School of Veterinary Medicine, Grenada, West Indies

Concern of human disease due to gastrointestinal pathogens, *Salmonella* spp., *Campylobacter* spp., *Vibrio* spp., *Escherichia coli*, and *Yersinia enterocolitica* continues worldwide. For prevention and control of outbreaks, it is important to have knowledge of the sources of infection or the animal reservoirs. In Grenada, we isolated several potentially human pathogenic serovars of *Salmonella* from animals in the last few years. These included *Salmonella enterica* serovars Javiana, Rubislaw, and Montevideo from free-living cane toads.¹ A somewhat similar picture was evident with regard to mongoose, another wild animal in Grenada. The most common serovars were Javiana and Montevideo.² Of these, serovar Javiana had emerged as a human pathogen in the United States a few years ago. Our isolates showed absence of resistance to the currently used antibiotics for cases of human salmonellosis, including ciprofloxacin and cefotaxime. In another recent study done in Grenada, we isolated *S. Saintpaul* and *S. Montevideo* from blue land crabs. In the Caribbean, *S. Saintpaul* has been frequently isolated from humans.³ On the other hand, Rubislaw was the most common serovar from green iguanas (*Iguana iguana*), and some isolates showed reduced susceptibility to cefotaxime.⁴ Blue land crabs and green iguanas are used as human food in Grenada, which is a matter of concern when these animals may carry pathogenic *Salmonella* strains with drug resistance.

Campylobacter spp. can cause not only gastroenteritis, but also extragastrointestinal manifestations including Guillain-Barré syndrome (GBS). *C. jejuni*-related GBS is perhaps on the increase in some countries.⁵ GBS-like conditions can occur in animals, and further studies are required.⁶ *Campylobacter jejuni* and *C. coli*, including strains similar to those causing human disease have been isolated from animals in Grenada. However, we have not looked for the emerging species *C. ureolyticus*, which was called *Bacteroides ureolyticus* until recently. Hariharan et al⁷ isolated *B. ureolyticus* from many equine endometrial swabs 2 decades ago in Canada. It has become necessary to include *C. ureolyticus* in further epidemiological studies on *Campylobacter* spp. This species of *Campylobacter* appears to surpass *C. coli* as the second most common causative agent of *Campylobacter*-related human gastroenteritis in Ireland.⁸

Potentially zoonotic vibrios have been isolated from shellfish, including conchs from Grenada.⁹ Little is known regarding the bacteria associated with the queen conch (*Strombus gigas*), and further research is needed on this shellfish used for human consumption in the Caribbean.

Animals such as goats may harbor human pathogenic strains of *E. coli*, such as serotype O157:H7.¹⁰ Hariharan et al¹¹ reported a case of diarrhea and systemic infection in a goat due to *Escherichia fergusonii*. This organism can cause disease resembling salmonellosis in ruminants, and diarrhea in humans as well.

Another re-emerging organism is *Yersinia enterocolitica*, causing unusual increase in human cases.¹² Pigs are the main reservoirs of virulent serotypes of this organism.¹³

In summary, research on animal reservoirs of human bacterial pathogens need to continue for understanding the epidemiology, and for effective prevention and control.

REFERENCES

1. Drake M, Amadi V, Zieger U, Johnson R, Hariharan H. Prevalence of Salmonella spp. in cane toads (*Bufo marinus*) from Grenada, West Indies, and their antimicrobial susceptibility. *Zoonoses Public Health*. 2013; 60: 437-441. doi: [10.1111/zph.12018](https://doi.org/10.1111/zph.12018)
2. Miller S, Amadi V, Stone D, Johnson R, Hariharan H, Zieger U. Prevalence and antimicrobial susceptibility of Salmonella spp. in small Indian Mongooses (*Herpestes auro punctatus*) in Grenada. *Comp Immunol Microbiol Infect Dis*. 2014; 37: 205-210. doi: [10.1016/j.cimid.2014.05.003](https://doi.org/10.1016/j.cimid.2014.05.003)
3. Peterson R, Hariharan H, Matthew V, et al. Prevalence, serovars, and antimicrobial susceptibility of Salmonella isolated from Blue Land Crabs (*Cardisoma guanhumi*) in Grenada, West Indies. *J Food Prot*. 2013; 76: 1270-1273. doi: [10.4315/0362-028X.JFP-12-515](https://doi.org/10.4315/0362-028X.JFP-12-515)
4. Sylvester WRB, Amadi V, Pinckney R, et al. Prevalence, serovars and antimicrobial susceptibility of Salmonella spp. from wild and domestic green iguanas (*Iguana iguana*) in Grenada, West Indies. *Zoonoses Public Health*. 2014; 61: 436-441. doi: [10.1111/zph.12093](https://doi.org/10.1111/zph.12093)
5. Kaakoush NO, Castano-Rodriguez N, Mitchell HM, Ming Man S. Global epidemiology of Campylobacter infection. *Clinical Microbiology Reviews*. 2015; 28: 687-720. doi: [10.1128/CMR.00006-15](https://doi.org/10.1128/CMR.00006-15)
6. Hariharan H, Rodriguez A, Hariharan S. Update on Guillain-Barre Syndrome-like conditions in animals. *Webmed Central Veterinary Medicine*. 2011; 2(6): 1-9. doi: [10.9754/journal.wmc.2011.001959](https://doi.org/10.9754/journal.wmc.2011.001959)
7. Hariharan H, Richardson G, Horney B, Heaney S, Bryenton J, Moore I. Isolation of Bacteroides ureolyticus from the equine endometrium. *J Vet Diagn Invest*. 1994; 6: 127-130. doi: [10.1177/104063879400600130](https://doi.org/10.1177/104063879400600130)
8. O'Donovan D, Corcoran GD, Lucey B, Sleator RD. Campylobacter ureolyticus: A portrait of the pathogen. *Virulence*. 2014; 5(4): 498-506. doi: [10.4161/viru.28776](https://doi.org/10.4161/viru.28776)
9. Hariharan H, Amadi V. Shellfish as reservoirs of bacterial pathogens. *Journal of Coastal life Medicine*. 2016; 4: 253-258. Web site: <http://jclmm.com/qk/20164/1.pdf>. Accessed August 21, 2016
10. Amadi VA, Avendano E, Onyegbule OA, et al. Antimicrobial drug resistance in Escherichia coli including O157:H7 isolate from feces of healthy goats in Grenada. *Annual Research & Review in Biology*. 2015; 7: 68-74. doi: [10.9734/ARRB/2015/17129](https://doi.org/10.9734/ARRB/2015/17129)
11. Hariharan H, Lopez A, Conboy G, Coles M, Muirhead T. Isolation of Escherichia fergusonii from the feces and internal organs of a goat with diarrhea. *Can Vet J*. 2007; 48: 630-631. Web site: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1876196/>. Accessed August 21, 2016
12. Martin L, Cabanel N, Lesoille C, Menrd T, Carniel E. Investigation of an unusual increase in human yersiniosis in Creuse, France. *Int J Infect Dis*. 2015; 34: 76-78. doi: [10.1016/j.ijid.2015.03.011](https://doi.org/10.1016/j.ijid.2015.03.011)
13. Hariharan H, Giles JS, Heaney SB, Leclerc SM, Schurman RD. Isolation, serotypes, and virulence-associated properties of Yersinia enterocolitica from the tonsils of slaughter hogs. *Can J Vet Res*. 1995; 59: 161-166. Web site: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1263759/>. Accessed August 21, 2016