Sousa et al; ***Salmonella*** **Carrau Septicemia in a South American River Turtle (*Podocnemis expansa*)**
Braz J Vet Pathol, 2011, 4(3), 181-182.

BJVP
Brazilian Journal of Veterinary Pathology

Letter to the Editor

Salmonella Carrau Septicemia in a South American River Turtle (*Podocnemis expansa*)

Dear Editor,

Cold-blooded animals can harbor a wide variety of *Salmonella* serotypes in their intestine (2, 10). In chelonians some species of *Salmonella* are considered part of the intestinal flora of their hosts, without developing any clinical sign. However, in animals with compromised immune system, salmonellosis (zoonosis) can happen, causing important clinical disease (1, 5, 9). Pet turtles are frequently reported as responsible for salmonellosis in humans (11, 13). *Salmonella* species has also been detected in free-living turtles (5).

The present study reports *Salmonella* Carrau in a 2-month-old South American river turtle (*Podocnemis expansa*). This animal was captured in wildlife with many others from the same species, in Trombetas river (Amazonian region), for a nutritional management research in captivity at São Paulo State.

The transport of the animals was done in water tanks by trucks, during 10 days until arrival at São Paulo State, where they were kept in cement tanks with potable water from an artesian well that was renewed daily. The turtles were fed with commercial ration for turtles. Two weeks after been kept in captivity, there was an increased mortality of the turtles. One ill turtle was physically exanimate. The plastron showed some hyperemic areas and algae grow (Figure 1). Blood samples were collected by heart puncture and inoculated in enrichment broth and maintained at 37ºC for 24 hours. Again a sample of it was streaked on brilliant green agar and MacConkey agar plates. Non-fermenting colonies present after incubation at 37ºC for 24 hours were submitted to biochemical examination, being inoculated in triple sugar iron agar and lysine iron agar. In addition to the biochemical tests, colonies were checked out using anti-serum to *Salmonella*, using polyvalent anti-somatic antigen serum (O) and polyvalent antiflagellar antigen serum (H) of *Salmonella*. Serotyping identification revealed *Salmonella* Carrau.

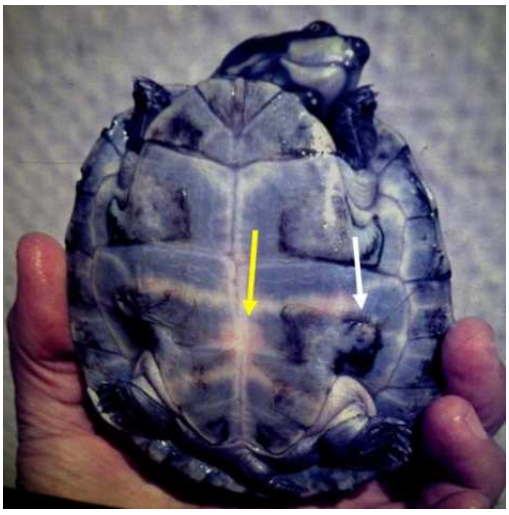

Figure 1: Exemplar of *Podocnemis expansa* showing hyperemic area (yellow arrow) and algae grow (white arrow) on the plastron.

It is already known that *Salmonella* spp. can occurs naturally in the intestine flora of many cold-blooded vertebrates without clinical signs. Approximately 90% of all reptiles carry and shed *Salmonella* with their feces (3, 14) into the environment, where they may readily survive and multiply (3). Aquatic environment represent favorable condition for maintained these bacteria. Ingestion of feces or contaminated water is considered a probable way of

Brazilian Journal of Veterinary Pathology. www.bjvp.org.br . All rights reserved 2007.

infection with *Salmonella*, since turtles feed mainly into water (4). Another origin of the agent might be the transmission by eggs, which are contaminated when they are laid due to *Salmonella* penetration through the eggshell, infecting the hatchlings (12), what could be happen in this case, considering that the animal in question was very young. Although the bacteria has already been isolated from healthy reptiles (7, 10), in immune deficient animals, *Salmonella* can cause diseases. Risk factors such as transport, overpopulation, inadequate hygiene, malnutrition, changes in ambient temperature, and concomitant infections can contribute to the development of salmonelosis in the animals called reservoirs (6). In those situations the equilibrium of the intestinal flora can be affected, resulting in *Salmonella* multiplication, toxin production and septicemia, as seen in this report. *Salmonella* in reptiles have been reported mainly in reference to their zoonotic significance (13). *Salmonella* Carrau is a serotype of *Salmonella* that was isolated from tegu lizards (*Tupinambis merianae*) (7) and also from humans in Amazon region of Brazil (8), indicating a possible important relationship between these species.

Acknowledgments

The authors are grateful to Augusto Shinya Abe for the turtle and to the Institute Adolfo Lutz for the serotyping identification.

1. CHIODINI, RJ. SUNDBERG. J. Salmonellosis in reptiles: a review. Am. J. Epidemiol., 1981, 115, 494-495.

2. CORRENTE M., MADIO A., FRIEDRICHK G., GRECO G., DESARIO C., TAGLIABUE S., D'INCAU M., CAMPOLO M., BUONAVOGLIA C. Isolation of *Salmonella* strains from reptile and comparison of different culture media. J. Appl. Microbiol., 2004, 96, 709-715.

3. GEUE L., LÖSCHNER U. *Salmonella enterica* in reptiles of German and Austrian origin. Vet. Microbiol., 2002, 84, 79-91.

4. HIDALGO-VILA J., DIAZ-PANIAGUA C., FRUTOS-ESCOBAR C., JIMÉNEZ-MARTÍNEZ C., PÉREZ-SANTIGOSA N. *Salmonella* in free-living terrestrial and aquatic turtles. Vet. Microbiol., 2007, 119, 311-315.

5. HIDALGO-VILA J., DIAZ-PANIAGUA C., RUIZ X., PORTHEAULT A., EL MOUDEN H., SLIMANI T., FRUTOS-ESCOBAR C., CASO MS. *Salmonella* species in free-living spur-thighed tortoises (*Testudo graeca*) in central western Morocco. Vet. Rec., 2008, 162, 218-219.

6. JOHNSON-DELANEY CA. Reptile zoonoses and threats to public health. MADER DR. Ed. Reptile Medicine and Surgery. St. Louis: ELSEVIER, 2006, 1017-1022.

7. MACIEL BM., ARGÔLO FILHO RC., NOGUEIRA SSC., DIAS JCT., REZENDE RP. High Prevalence of *Salmonella* in Tegu Lizards (*Tupinambis merianae*), and susceptibility of the serotypes to antibiotics. Zoonoses and Public Health, 2009, 1-7.

8. MARQUES NDB, RAMOS FLP, REIS EMF, RODRIGUES DP, HOFER E. *Salmonella* serovars of human origin identified in Pará State, Brazil from 1991 to 2008. Rev. Pan-Amaz Saude, 2010; 1, 93-100.

9. ONDERKA D.K., FINLAYSON M.C. *Salmonellae* and salmonellosis in captive reptiles. Can. J. Comp. Med., 1985, 49, 268-270.

10. PASMANS F., MARTEL A., BOYEN F., VANDEKERCHOVE D., WYBO I., IMMERSEEL FV., HEYNDRICKX M., COLLARD JM., DUCATELLE R., HAESEBOUCK F. Characterization of *Salmonella* isolates from captive lizards. Vet. Microbiol., 2005, 110, 285-291.

11. SÁ IVA., SOLARI CA. *Salmonella* in Brazilian and imported pet reptiles. Braz. J. Microbiol., 2001, 32, 293-297.

12. SCHRÖTER M., SPEICHER A., HOFMANN J., ROGGENTIN P. Analysis of the transmission of *Salmonella* spp. through generation of pet snakes. Environ. Microbiol., 2006, 8, 556-559.

13. WEIL BJ., MARTENS PB., HARTE JS. Iguana-associated salmonellosis in a young adult. J. Adolesc. Health, 1995, 17, 120-122.

14. WOODWARD, D.L., KHAKHRIA, R., JOHNSON, W.M. Human salmonellosis associated with exotic pets. J. Clin. Microbiol., 1997, 35, 2786-2790.

Eliane de Sousa[1]
Karin Werther[1]
Tânia de Freitas Raso[2]
Ângelo Berchieri Júnior[1]

[1]Departamento de Patologia Veterinária, FCAV - UNESP - Jaboticabal-SP,
[2]Departamento de Patologia, FMVZ - USP- São Paulo-SP, Brazil.
Corresponding Author: Eliane de Sousa, Via Prof. Paulo Donato Castellane, km 5,
Jaboticabal - SP, 14884-900, Brazil.
E-mail: elianesb@fcav.unesp.br