


## First Isolation of *Pseudomonas aeruginosa* from Ear Abscess of a Red-Eared Slider (*Trachemys scripta elegans*)

Mehmet Nuri AÇIK<sup>1</sup>  Sami ÜNSALDI<sup>2</sup> Şule MELEK<sup>2</sup> Burhan ÇETİNKAYA<sup>3</sup>

<sup>1</sup> Department of Microbiology, Faculty of Veterinary Medicine, University of Bingol, TR-12000 Bingol - TURKEY

<sup>2</sup> Department of Surgery, Faculty of Veterinary Medicine, University of Bingol, TR-12000 Bingol - TURKEY

<sup>3</sup> Department of Microbiology, Faculty of Veterinary Medicine, University of Firat, TR-23119 Elazig - TURKEY

Article Code: KVFD-2018-19410 Received: 16.01.2018 Accepted: 02.05.2018 Published Online: 03.05.2018

### How to Cite This Article

Açık MN, Ünsaldı S, Melek Ş, Çetinkaya B: First isolation of *Pseudomonas aeruginosa* from ear abscess of a red-eared slider (*Trachemys scripta elegans*). *Kafkas Univ Vet Fak Derg*, 2018 (Article in Press). DOI: 10.9775/kvfd.2018.19410

### Abstract

This case report is the first of the isolation and identification of *Pseudomonas aeruginosa* in a female, one year old red-eared slider hospitalized at the Surgery Clinics of Veterinary Faculty, Bingol University, Turkey, for unilateral ear abscess. Susceptibility of the agent to several antibiotics was also tested.

**Keywords:** Red-eared slider, Ear abscess, *Pseudomonas aeruginosa*

## Kırmızı Yanaklı Bir Su Kaplumbağasının Kulak Apsesinden *Pseudomonas aeruginosa*'nın İlk İzolasyonu

### Öz

Bu olgu sunumunda tek taraflı kulak apsesi şikayeti ile Bingöl Üniversitesi Veteriner Fakültesi Cerrahi Kliniğine getirilen bir yaşlı dişi kırmızı yanaklı bir su kaplumbağasından ilk kez *Pseudomonas aeruginosa*'nın izolasyonu ve identifikasyonu yapıldı. Ayrıca bu etkenin antibiyotiklere olan duyarlılıkları araştırıldı.

**Anahtar sözcükler:** Kırmızı yanaklı su kaplumbağası, Kulak apsesi, *Pseudomonas aeruginosa*

## INTRODUCTION

In Red-Eared Sliders, unilateral or bilateral ear abscesses may have a mild course as well as reach the severity that restricts the movement of the animal. Although many predisposing factors such as poor hygienic conditions, stress, vitamin A deficiency and malnutrition play a role in the formation of ear abscess, the etiology of the disease has not been fully elucidated [1,2]. The opportunistic pathogens found in water are thought to play an important role in the abscess formation by passing through the auditory canal and colonizing in the ear [1]. Although in a limited number of studies, various Gram positive and Gram negative bacteria are suggested to get involved in the etiology of ear abscesses of turtles [3,4], no data are available in the literature indicating possible role of *P. aeruginosa* as a primary factor in ear abscesses of Red-Eared Sliders. Therefore, this case report presents novel information toward the etiology of

ear abscesses in turtles by detecting *P. aeruginosa* for the first time. One of the interesting properties of *P. aeruginosa* is its progressively increasing resistance to many antibiotics in the market in recent years. Hence, antibiotic resistance levels of the agent isolated in the present study were also investigated.

## CASE HISTORY

The material of this case report was a female, one-year old Red-Eared Slider admitted to the Surgery Clinics of Veterinary Faculty, Bingol University, Turkey, with the complaint of swelling on one side of its head that developed over a period of one month. In clinical examination, the swelling was observed to be a unilateral ear (auricular) abscess (Fig. 1) and, it was decided to clean the content with surgical procedure. General anesthesia was provided by intramuscular administration of 20 mg/



### İletişim (Correspondence)



+90 426 2160012/1199



mnacik@bingol.edu.tr



**Fig 1.** Clinical outlook of unilateral ear abscess

kg of Ketamine HCl (Alfamine, Egevet, Turkey) to the patient. A 3-4 mm linear skin incision covering the upper part of the swelling in the ear area was made, carried up to the abscess pouch, which was then opened. Its content was caseified and removed under sterile conditions. For microbiological examination, samples were taken from both abscess content and by applying a sterile swab to the inner part of the abscess pouch. Next, the abscess pouch was washed with isotonic saline solution.

Samples taken from abscess pouch by sterile swabs were inoculated onto Tryptone Soy Agar (Oxoid, CM0131) and incubated at 37°C in aerobic conditions for 24 h. The growing colonies were identified as *P. aeruginosa* according to Gram staining, motility, colony morphology, growth at 42°C, pigment production, catalase, oxidase, indole and citrate tests. The agent was confirmed as *P. aeruginosa* (99.9%) following the analyses performed with VITEK 2 automated system. Antibiotic susceptibilities of the isolate were investigated by using disc-diffusion method [5]. For this purpose, the susceptibility of the isolate against a total number of nine antibacterial agents, including ceftazidime (10 µg), piperacillin-tazobactam (30-6 µg), gentamicin (10 µg), amikacin (30 µg), imipenem (10 µg), meropenem (10 µg), cefepime (30 µg), ciprofloxacin (5 µg) and colistin (10 µg), which are frequently used in human medicine was tested. The results showed that *P. aeruginosa* isolate was sensitive to the majority of the antibacterial substances at various levels.

## DISCUSSION

The morbidity and mortality of tympanic infections in turtle species are rather high. Several factors have been linked to the etiology of ear abscesses which have significant place among these infections [1,2]. A number of bacteria which are common in the environment and water and, mostly comprised of opportunistic pathogens

have been put forward as leading factors. In a study on box turtles, Joyner *et al.* [3] isolated Gram negative bacteria, including *Citrobacter*, *Morganella*, *Pasteurella* and *Proteus* and Gram positive bacteria, including *Corynebacterium*, *Listeria*, *Staphylococcus* and *Streptococcus* from ear abscesses. Similar results have also been reported in previous studies [1,4,6]. Therefore, this is the first study reporting the involvement of *P. aeruginosa* in the etiology of ear abscesses of Red-Eared Sliders. *P. aeruginosa* can be found extensively in the environment (particularly in soil and water), as well as in the mouth cavity and intestines of reptiles commensally [7,8]. The agent can also cause stomatitis, pneumonia, keratoconjunctivitis, dermatitis, septicemia and death in the immunosuppressed reptiles [9]. The interesting information obtained from anamnesis of the patient examined in the

present study was the formation of conjunctivitis prior to ear abscess. Bearing this information in mind, it was concluded that *P. aeruginosa* might have caused abscess formation by colonizing the ear cavity following conjunctivitis or, alternatively, the infection by this opportunist agent might be the result of the immunosuppression.

*P. aeruginosa* should also be considered in terms of public health because it causes serious infections in people with cystic fibrosis, immunosuppression and chronic diseases [10]. In particular, contact with pet turtles is considered as an important factor increasing this risk. Therefore, people who keep such animals as pets should strictly observe hygiene and sanitation rules.

Following intensive use of antibiotics, as in the case of other bacteria, the level of antibiotic resistance in *P. aeruginosa* appears to be progressively increasing. It has been reported that multidrug resistance in *P. aeruginosa* against medicines used in both human and veterinary medicine has reached such a level that threatens public health and it is very difficult to control the infections caused by this agent [10,11]. Wendt *et al.* [12] reported that 17 *P. aeruginosa* isolates originated from pet turtles were resistant to amoxicillin, colistin sulphate, streptomycin, cephalothin, trimethoprim, chloramphenicol, imipenem, cefoxitin and nalidixic acid, but sensitive to ciprofloxacin and ofloxacin. The isolate obtained in this study was found to be sensitive to all the antibiotics tested, in contrast to other studies. It was commented that drug resistance has not been developed in the animal used in the current study due probably to the application of good sanitation conditions and no use of antibiotics treatment, so far.

In conclusion, the present study was the first to report the isolation and identification of *P. aeruginosa* as primary agent in the ear abscess of a Red-Eared Slider.

## REFERENCES

1. **Murray MJ:** Aural abscesses. **In,** Mader DR (Ed): Reptile medicine and surgery. 3<sup>rd</sup> ed., WB Saunders Co, Philadelphia, Pennsylvania, 349-352, 1996.
2. **Holladay SD, Wolf JC, Smith SA, Jones DE, Robertson JL:** Aural abscesses in wild-caught box turtles (*Terrapene carolina*): Possible role of organochlorine-induced hypovitaminosis A. *Ecotoxicol Environ Saf*, 48, 99-106, 2001. DOI: 10.1006/eesa.2000.1993
3. **Joyner PH, Brown JD, Holladay S, Sleeman JM:** Characterization of the bacterial microflora of the tympanic cavity of eastern box turtles with and without aural abscesses. *J Wildl Dis*, 42 (4): 859-864, 2006. DOI: 10.7589/0090-3558-42.4.859
4. **Yardımcı B, Yardımcı C, Ural K, Seçer S:** Auricular abscessation in Red-Eared Sliders (*Trachemys scripta elegans*). *Kafkas Univ Vet Fak Derg*, 16 (5): 879-881, 2010. DOI: 10.9775/kvfd.2009.1076
5. **The European Committee on Antimicrobial Susceptibility Testing (EUCAST).** Disk Diffusion Method for Antimicrobial Susceptibility Testing. v 6.0 (January 2017)
6. **Stewart JS:** Anaerobic bacterial infections in reptiles. *J Zoo Wildl Med*, 21,180-184, 1990.
7. **Botzenhart K, Döring G:** Ecology and epidemiology of *Pseudomonas aeruginosa*. **In,** Campa M, Bendinelli M, Friedman H (Eds): *Pseudomonas aeruginosa* as an Opportunistic Pathogen. 1-18, Plenum Press, New York 1993.
8. **Warwick C, Arena PC, Steedman C, Jessop M:** A review of captive exotic animal-linked zoonoses. *J Environ Health Res* 12 (1): 9-24, 2012.
9. **Denardo D:** Dystocias. **In,** Mader DR, Divers SJ (Eds): Reptile medicine and surgery. 2<sup>nd</sup> ed., St Louis (MO), Elsevier, 787-792, 2006.
10. **Stefani S, Campana S, Cariani L, Carnovale V, Colombo C, Lleo MM, Iula VD, Minicucci L, Morelli P, Pizzamiglio G, Taccetti G:** Relevance of multidrug-resistant *Pseudomonas aeruginosa* infections in cystic fibrosis. *Int J Med Microbiol*, 307 (6): 353-362, 2017. DOI: 10.1016/j.ijmm.2017.07.004
11. **Ruiz-Garbajosa P, Cantón R:** Epidemiology of antibiotic resistance in *Pseudomonas aeruginosa*. Implications for empiric and definitive therapy. *Rev Esp Quimioter*, 1, 8-12, 2017.
12. **Wendt M, De Silva BCJ, Heo GJ:** Virulence factors and antimicrobial resistance of *Pseudomonas aeruginosa* isolated from pet turtles. *Asian J Anim Vet Adv*, 12 (4): 205-211, 2017. DOI: 10.3923/ajava.2017.205.211