

***Malassezia* Dermatitis in a South American Sea Lion (*Otaria byronia*)**

Miji Ahn, Seulgi BAE and Taeho OH¹

Laboratory of Veterinary Dermatology, College of Veterinary Medicine, Kyungpook National University, Daegu 702-701, Korea

(Accepted: April 17, 2014)

Abstract : *Malassezia* spp. was isolated from the skin lesion of a South American Sea Lion (*Otaria byronia*) in South Korea. Colonies were cream to yellowish with smooth margin on Sabouraud dextrose agar without lipid supplements. Yeast cells were ovoid to cylindrical in shape and budding daughter cells from broad base. We conducted 26s rRNA sequencing to specify the strain of the yeast and found out this isolate highly matched with *Malassezia pachydermatis* isolated from canine otitis. The pulse therapy of oral itraconazole was very effective in this case. *M. pachydermatis* has a wide range of host animals but this is the first report in a sea lion in South Korea.

Key words : *Otaria byronia*, *Malassezia pachydermatis*, 26s rRNA, itraconazole.

Introduction

Malassezia pachydermatis is a common commensal of skin in variety animals, especially in canidae (6). *M. pachydermatis* is considered as a normal flora of skin of dogs, but they cause dermatitis of domestic animals and humans (1,3,5). We collected the yeast from skin lesions of a South American sea lion and identified as *M. pachydermatis*. This report is the third revelation about *M. pachydermatis* in dermatitis of a marine mammal and first paper in South Korea.

Case

Dermatological problems of sea lions are usually caused by virus (e.g. poxvirus, calicivirus) or parasites (e.g. lice, demodex spp.) (4). Few cases were only reported dermatitis from *M. pachydermatis* in a California sea lion and South American sea lion (7-9). This brief communication reports a case of skin disease caused by *M. pachydermatis* in a South American sea lion.

Multi-focal skin lesions occurred in a two-year-old male South American sea lion. Multiple wheals (2 to 4 mm) were first found on both webfoot 4 months ago in the spring and has been spread to chest becoming more severe. The animal didn't scratch the lesion and had no symptoms of pain.

Direct skin smear was conducted using slide glass and skin sample were collected with sterile cotton swabs. Yeast-like organism was observed on the slide glass after Diff-quick staining under microscopy. Many basophilic oval budding cells were found (2.0 to 2.5 × 4.0 to 5.0 um). Cotton swabs were inoculated on Sabraud's Dextrose agar without lipid

supplements and incubated for one week at 35°C. Colonies were cream to yellowish with soft texture and cells had identical characteristics with the direct smear sample under the microscopy. For the certain identification, 26s rRNA sequencing was conducted (2). The isolates showed 99% identities with *Malassezia pachydermatis* strain CBS 1879 26S ribosomal RNA gene (Accession number AY743605). There was only single base difference at 524 base pair site (Fig 1). Other seals contacted with the animal had no lesions and culture test showed negative results.

Oral itraconazole 3 mg/kg SID was described for two weeks. After one week of treatment, skin lesions improved but the seal started to show diarrhea and anorexia. The zookeeper withdrew the treatment to stop the intestinal symptoms and skin lesions began to relapse in one week after withdrawal of the drug. The animal lost weight (50 kg to 46.4 kg) but resumed to eat after discontinue of itraconazole. We changed dosing strategy to pulse medication because of the side effects. The animal was given the drug 2 mg/kg/day two days in row and took off the medicine next 5 days. After four weeks, there was no trace of skin lesions and result of skin culture was negative.

Discussion

Malassezia dermatitis in dogs is caused by opportunistic infection of symbiont yeasts on the skin. The yeasts thrive when the environment of skin changes and skin barrier system is impaired. The predisposing factors of *Malassezia* infection in dogs are hypersensitivity diseases (e.g. atopy), impaired immune system, keratinization defects ("seborrhea"), recurrent bacterial pyodermas, and endocrine diseases (10). The seal had no history of immune-mediated problems and immunosuppressive therapy, so we ruled out the possibility

¹Corresponding author.
E-mail : thoh@knu.ac.kr

```

sea_lion      TAACAAGGATTCCCCTAGTAAACGGCGAGCGAAGCGGGAAGAGCTCAAATTTGAAAGCTGG
AY743605     TAACAAGGATTCCCCTAGTAAACGGCGAGCGAAGCGGGAAGAGCTCAAATTTGAAAGCTGG
*****

sea_lion      CACCTTCGGTGTCCGCGTTGTAATCTCGAGACGTGTTTTCCGTGTGGCGCTATGGACAAG
AY743605     CACCTTCGGTGTCCGCGTTGTAATCTCGAGACGTGTTTTCCGTGTGGCGCTATGGACAAG
*****

sea_lion      TCCCTTGGAACAGGGCATCGTAGAGGGTGAAAATCCCGTACTTGCCATGGCTGTACCATG
AY743605     TCCCTTGGAACAGGGCATCGTAGAGGGTGAAAATCCCGTACTTGCCATGGCTGTACCATG
*****

sea_lion      CTTTGTGATACACGCTCTAAGAGTCGAGTTGTTTGGGATTGCAGCTCAAAAATGGGTGGTA
AY743605     CTTTGTGATACACGCTCTAAGAGTCGAGTTGTTTGGGATTGCAGCTCAAAAATGGGTGGTA
*****

sea_lion      GACTCCATCTAAAGCTAAATATCGGGGAGAGACCGATAGCGAACAAGTACCGTGAGGGAA
AY743605     GACTCCATCTAAAGCTAAATATCGGGGAGAGACCGATAGCGAACAAGTACCGTGAGGGAA
*****

sea_lion      AGATGAAAAGCACTTTGGAAAGAGAGTTAAAAGTACGTGAAATTGTCGAAAAGGGAAGCGC
AY743605     AGATGAAAAGCACTTTGGAAAGAGAGTTAAAAGTACGTGAAATTGTCGAAAAGGGAAGCGC
*****

sea_lion      TTGAAGTCAGCCATGCTGCTTGAGACTCAGCCTTGCTTTTGGTGTATTCTCGGTA
AY743605     TTGAAGTCAGCCATGCTGCTTGAGACTCAGCCTTGCTTTTGGTGTATTCTCGGTA
*****

sea_lion      GCAAGCCAGCATTGGTTCGAGTCGTCGGAGAAGGGTATGAGAAATGTGGCATCCTCGGAT
AY743605     GCAAGCCAGCATTGGTTCGAGTCGTCGGAGAAGGGTATGAGAAATGTGGCATCCTCGGAT
*****

sea_lion      GTGTTATAGACTTGTACTGGATACGACGATTGGATCAAGGAACGCAGTGTGCCTCTGGC
AY743605     GTGTTATAGACTTGTACTGGATACGACGATTGGATCAAGGAACGCAGTGTGCCTCTGGC
*****

sea_lion      GGGTCTTCGGACACCTTCACACTTAGGATGCTGGCGTAAT
AY743605     GGGTCTTCGGACACCTTCACACTTAGGATGCTGGCGTAAT
*****
    
```

Fig 1. Alignment of 26s rRNA sequences of *M. pachydermatis* strains. AY743605 is used as the model. Identical nucleotides are indicated by dots.

of immune system destruction with iatrogenic causes. We didn't find any specific systemic signs of hormonal diseases and it was first time that the animal developed skin lesions, which ruled out recurrent pyodermas. The possible predisposing factor of the yeast infection in this case may be the plywood inside of the cage. Not like the other two seals, this animal was kept in the cage with plywood being boarded up and consistently leaned its head and neck on the plywood. This behavior may destruct the skin barrier and result in skin infection. Another case of *Malassezia pachydermatis* infection in California sea lion reported the similar environment of this case, which was duckboards on the floor (6).

As skin commensal of sea lions has not studied yet, the origin of the yeast is obscure. The animal was acting a seal show using the same stage together with dogs, pigs, monkeys, birds, and goats. Therefore, transfer from other animals or humans may be possible since they didn't clean the stage right after another animals' show. Zookeepers who han-

dled other animals may touch the seal without washing their hands. Unclean environment may play role in deterioration of epidermal condition. We sampled water and surface of floor for culture test, but couldn't find the yeast.

Clinical signs of the pinnipeds were different from *M. pachydermatis* in dogs. Usually pruritus is a major sign of *Malassezia* dermatitis of dogs and cats. Dogs have alopecia, erythema, and crust lesions (10). However, in this case, the seal didn't show any of signs above.

In conclusion, *Malassezia pachydermatis* dermatitis was diagnosed by mycological culture and DNA sequencing in a South American sea lion. To the author's knowledge, this is the first report of the *M. pachydermatis* related dermatitis of pinnipeds in South Korea. Very little is known of skin commensal of pinnipeds. The role of *M. pachydermatis* and epidemiology of the yeast on the skin of pinnipeds should be more investigated. In this case, the sequencing result was almost matched as *M. pachydermatis* from a dog or a human

from Genebank. It is necessary to confirm the strain with genetic methods when pinnipeds have dermatitis suspected case of *Malassezia* dermatitis.

Acknowledgement

This research was supported by Kyungpook National University Research Fund, 2012.

References

1. Akerstedt J, Vollset I. *Malassezia pachydermatis* with special reference to canine skin disease. *Br Vet J* 1996; 152: 269-281.
2. Cabanes FJ. Molecular Analysis of *Malassezia sympodialis*-Related Strains from Domestic Animals. *J Clin Microbiol* 2005; 43: 277-283.
3. Cafarchia C. Occurrence and population size of *Malassezia* spp. in the external ear canal of dogs and cats both healthy and with otitis. *Mycopathologia* 2005; 160: 143-149.
4. Gage LJ. Pinnipedia (Seals, Sea Lions, Walruses) In: *Zoo and Wild Animal Medicine*. 5th ed. Philadelphia: Saunders. 2003; 459-475.
5. Gueho E. Association of *Malassezia pachydermatis* with Systemic Infections of Humans. *J Clin Microbiol* 1987; 25: 1789-1790.
6. Guillot J. Epidemiological analysis of *Malassezia pachydermatis* isolates by partial sequencing of the large subunit ribosomal RNA. *Res Vet Sci* 1997; 62: 22-25.
7. Guillot J. Dermatitis caused by *Malassezia pachydermatis* in a California sea lion (*Zalophus californianus*). *Vet Rec* 1998; 142: 311-312.
8. Nakagaki K. *Malassezia pachydermatis* Isolated from a South American Sea Lion (*Otaria byronia*) with Dermatitis. *J Vet Med Sci* 2000; 62: 901-903.
9. Pollock CG. Fungal Dermatitis in Captive Pinnipeds. *J Zoo Wildl Med* 2000; 31: 374-378.
10. Scott DW, Miller WH, Griffin CE. *Fungal Skin Diseases*. In: *Miller & Kirk's Small Animal Dermatology*. 6 ed. Philadelphia: WB Saunders. 2001: 363-371.

오타리아 물개(South American Sea Lion, *Otaria byronia*)에서 발생한 *Malassezia* 피부염

안미지 · 배슬기 · 오태호¹

경북대학교 수의과대학

요 약 : 오타리아 물개의 탈모성 피부염에서 *Malassezia* spp. 를 분리하였다. Sabouraud dextrose agar에서 성장한 집락형태는 유백색에서 황색조로 변연부는 매끄러웠다. 현미경 검경시 형태는 원형에서 실린더형이었고 증식을 지시하는 budding 형이 관찰되었다. 개의 외이염에서 분리한 *Malassezia pachydermatis*와 비교하기 위해 26s rRNA 염기서열 분석을 실시하여 99.9%의 일치도를 보였다. Itraconazole pulse therapy는 매우 효과적이었고 재발하지 않았다. 본 증례는 국내 물개에서 발생한 *Malassezia* 피부염 최초 보고로 판단된다.

주요어 : 오타리아 물개, *Malassezia pachydermatis*, 26s rRNA, itraconazole