

# Prevalence of Potential Human Bacterial Pathogens in Nasal Secretions of Domesticated Dogs



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# Research Purpose

- ❧ In modern times canines have developed an increasingly intimate live-in relationship with their human owners. This close contact suggests the possibility of dogs acting as vectors of transmission for some common human pathogens.
- ❧ The purpose of this study was to screen the nasal cavities of canine pets in the community for the presence of both streptococcal and staphylococcal species and subsequently determine the prevalence of antibiotic resistance amongst the isolates.



# Materials and Methods



- ❧ Biology students and staff with canines were asked to volunteer for this study.
- ❧ The outer nose surface and just inside both nostrils of 81 canine pets were swabbed.
- ❧ The samples were then placed on two different plates.
- ❧ One was selective for staphylococcal species and the other was selective for streptococcal species.



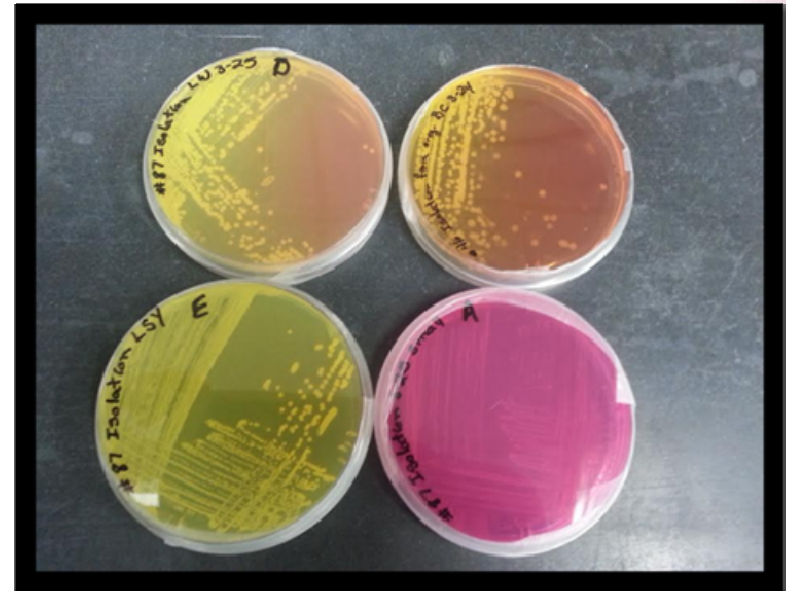
**Plates with staphylococcal species**



# Materials and Methods Cont.



- ❧ Twenty-five of the dogs provided more than one staphylococcal isolate totaling 101 samples.
- ❧ Samples were grown in nutrient broth and plated onto a different medium in order to prepare for identification of antibiotic susceptibilities.
- ❧ Penicillin, Cefoxitin, Tetracycline, and Erythromycin were used in determining antibiotic resistance.
- ❧ Colonies showing characteristics of being streptococci were collected from the original plate and tested for bacitracin susceptibility.



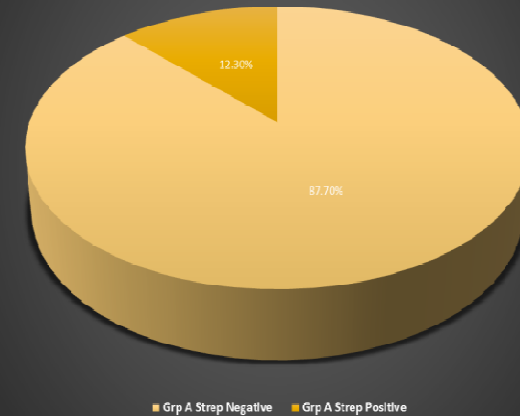
**Different staphylococcal morphologies from one dog**

# Results

## Streptococcal Isolates:

- ☞ Thirty-nine colonies that were suspicious of being streptococcal species were isolated from the 81 dogs.
- ☞ Ten of these colonies were bacitracin sensitive meaning 12.3% of the dogs in this study carried, or were colonized, by beta-hemolytic, bacitracin-sensitive strains of streptococci.

Figure 2: Percent of Canines Carrying Beta-Hemolytic, Bacitracin-Sensitive Streptococci



# Results

## Staphylococcal Isolates:

- 87.7% of the dogs in this study tested positive for staphylococci.
- Antibiotic resistance to penicillin was most notable at 79.2%.
- 2% were cefoxitin resistant.
- The cefoxitin isolates were also resistant to penicillin and erythromycin, but susceptible to tetracycline.

Antibiotic	Susceptible	Intermediate	Resistant	% Resistance
Penicillin	21	0	80	79.2
Cefoxitin	99	0	2	2.0
Tetracycline	80	10	11	10.9
Erythromycin	71	7	23	22.8



# Conclusion



- ❧ Overall, 12.3% of the dogs carried strains of Group A Streptococci, and 2.0% of the staphylococcal isolates were found to be methicillin-resistant strains.
- ❧ The overuse of antibiotics by veterinarian professionals is causing antibiotic resistance in canine just like the antibiotic resistance seen in humans today.
- ❧ Dogs are not just pets they also perform many jobs and interact with many people.
- ❧ More research is needed in identifying bacterial species and zoonotic infections.

# Thank You



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