

BOVINE MASTITIS

Is there correlation between antibiotic resistance and resistance genes?

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INTRODUCTION

Bovine mastitis, an inflammatory disease damaging the mammary glands, is categorized as a primary critical condition in dairy farms, infecting over 40% of cows inside the herd. It has become critical to study and comprehend the resistance rates and prevalence of mastitis caused by *Staphylococcus* sp. to refine the antibiotic treatments.

In this study, we will look at the correlation between antibiotic resistance and resistance genes in *Staphylococcus aureus* and *Staphylococcus chromogenes*. This will be done by looking at the comparison of penicillin (PEN) and *blaZ*, tetracycline (TET) and *tetK* and erythromycin (ERM) and *ermC*.

MATERIAL AND METHODS

- The database used in this experiment was obtained from Yang et al. 2023.
- General overview of antibiotic resistance and resistance genes done in Excel.
- RStudio was used to determine if the presence or absence of resistance genes was statistically associated with antibiotic resistance in the combinations of PEN and the *blaZ* gene, ERM and the *ermC* gene, and TET and the *tetK* gene.

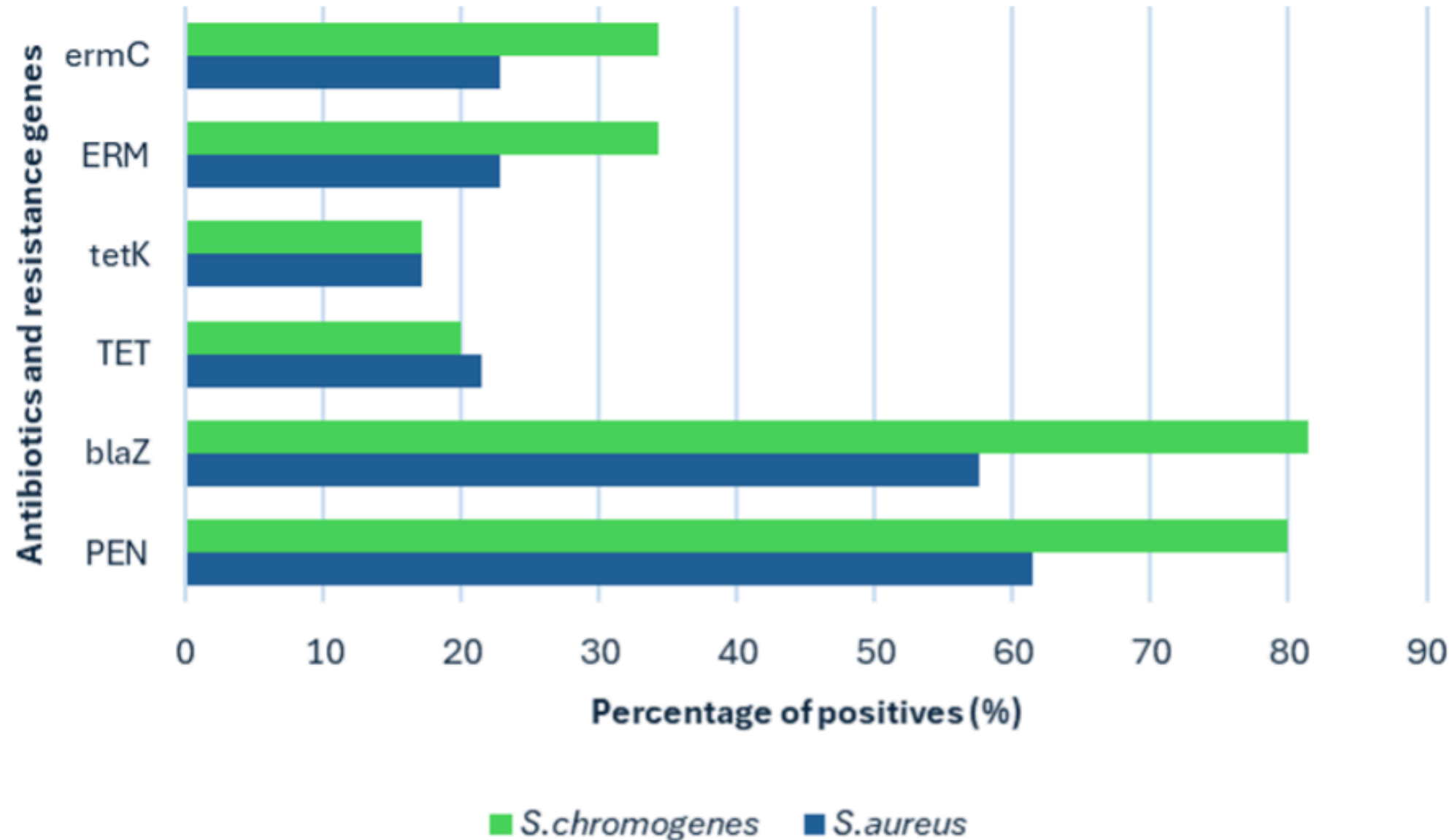


Figure 1. Percentage representation of the resistance and resistance genes.

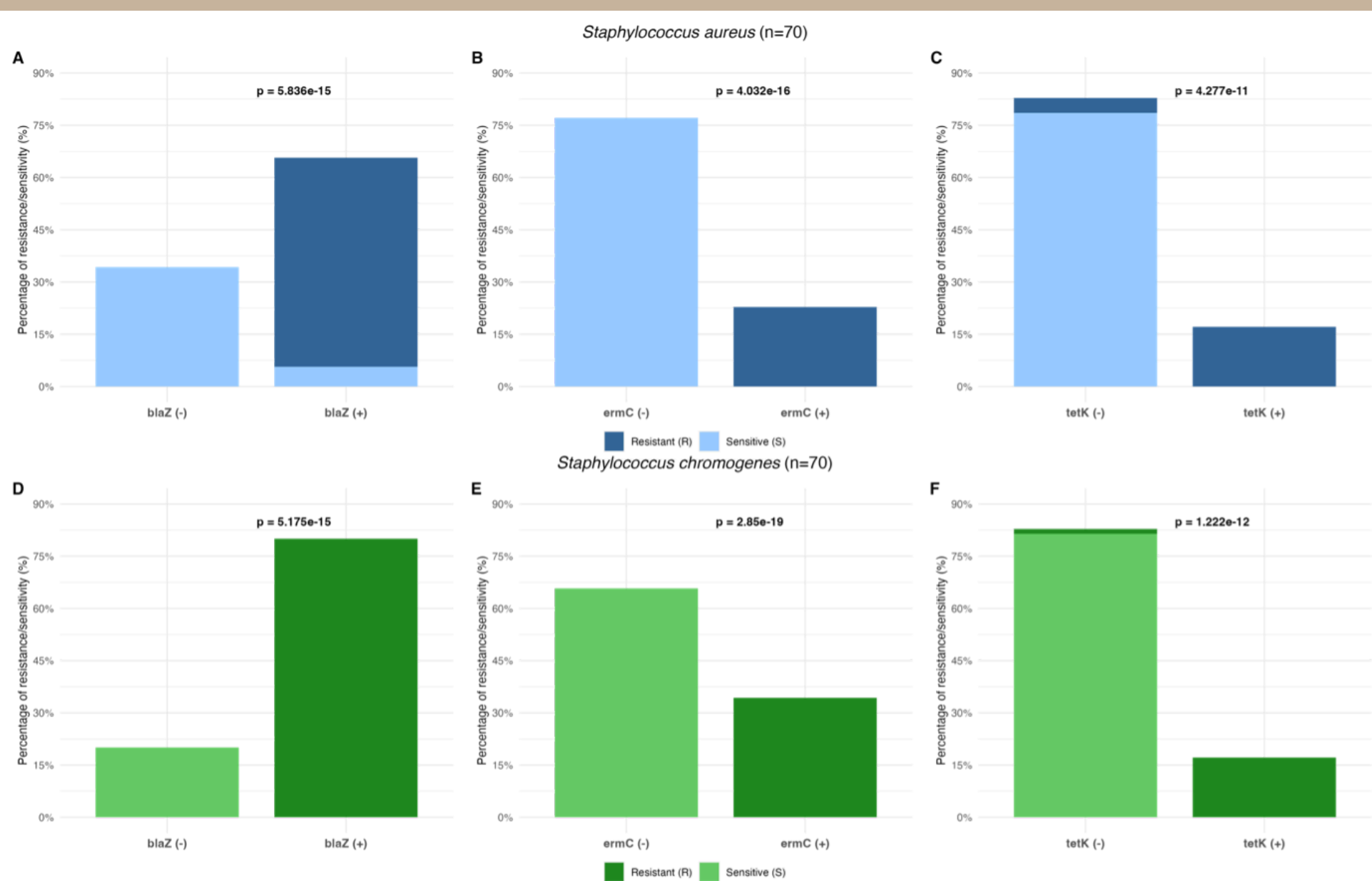


Figure 2. Fisher's test graphical representation of the resistance in relation to the presence of resistance genes.

RESULTS

- There is a close relationship between the antibiotic resistance and the resistance genes found within the pairs previously established.
- The presence of the resistance genes correlated to resistance in a much greater degree than isolates where the genes were absent.
- For analysis performed on both isolates, the results showed high association between each combination of antibiotics and genes tested for.

CONCLUSION

All of the genes comparisons' were significant which means that there is a correlation between the emergence of antibiotic resistance and resistance genes.



REFERENCE: Yang, F., Shi, W., Meng, N., Zhao, Y., Ding, X., & Li, Q. (2023). Antimicrobial resistance and virulence profiles of staphylococci isolated from clinical bovine mastitis. *Frontiers in Microbiology*, 14, 1190790.

