

TITLE: INTERSPECIES TRANSFER OF PLASMID-BORNE GENTAMICIN RESISTANCE BETWEEN *STAPHYLOCOCCUS* ISOLATED FROM DOMESTIC DOGS AND HUMANS

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ABSTRACT:

The intimate relationship between pets and owners is a common source for the trade of microorganisms, including bacteria resistant to multiple antimicrobial drugs with zoonotic potential. We evaluated the presence of antimicrobial resistance genes that are usually present in mobile genetic elements in 80 *Staphylococcus* strains, mostly *Staphylococcus pseudintermedius* and *Staphylococcus schleiferi*. Resistance to tetracycline was observed in 34% of the strains, followed by resistance to erythromycin (21%) and gentamicin (19%). The phenotypes were partially explained by the presence of tetracycline resistance genes *tetM* and *tetK* in 64% and 44% of the strains, respectively; erythromycin resistance genes *ermA* and *ermC* in 53% and 23%; and gentamicin resistance gene *aacA-aphD* in 26% of the strains. All strains form biofilms, being 50% strong or moderate producers, as observed by the crystal-violet method. At least 45% of the strains harbor high- and/or low-molecular weight plasmids. From those, we selected eight plasmid-bearing and multidrug resistant strains, which were submitted to plasmid curing by stress with SDS (100 µg/mL). No strain lost resistance during SDS stress, which may be due to a high number of copies or mechanisms to avoid curing. However, by conjugation experiments, the *S. pseudintermedius* strain 27 transferred its high-molecular weight plasmid, containing resistance to gentamicin, conferred by the *aac6aph2* gene, to a human *Staphylococcus aureus* strain. The frequent empirical use of gentamicin to treat skin and ear infections in domestic dogs is likely to select resistant strains that, as shown by our study, can be transferred to *S. aureus*, a human pathogen.

Keywords: *Staphylococcus pseudintermedius*, *Staphylococcus schleiferi*, plasmid, one health, antimicrobial resistance, gentamicin

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