Health, zoonotic pathogens and parasites

Wild boar (*Sus scrofa*) and *Mammaliicoccus sciuri* in One Health research

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Mammaliicoccus sciuri (syn.: *Staphylococcus sciuri*) is a ubiquitous bacterium among the oldest species close to the *Staphylococcus* genus. Currently, researchers show a great interest in this ancient bacterial species because of the frequent multidrug resistance feature. Since *M. sciuri* evolved before its close relatives, the staphylococci, scientists hypothesise that most of the resistance genes characteristic for the *Staphylococcus* genus evolved in this species. Most research findings support this hypothesis, since the most known antimicrobial resistance, the methicillin resistance can often be detected in *M. sciuri*. Wild boar is frequently considered as an indicator of the health of the ecosystem. Their rooting and scavenging activity support the pathogens to contaminate the animals body surface or infect their mucous membranes. Based on these facts, we hypothesised that nasal swab samples from wild boar and water samples of wild boar shallows are good sources of ubiquitously distributed bacterial species, such as *M. sciuri*. Our goal was to isolate *M. sciuri* strains from these samples and determine the antimicrobial susceptibility of these isolates. For this reason, we collected swab samples from the nasal cavity of hunted wild boar and water and mud samples from shallow pools used by the species. This sample collection was carried out in a nature conservation area to avoid areas with remarkable direct human impact.

Preliminary results supported our hypothesis, as more than fifth of the wild boar samples carried *M. sciuri*, while almost half of the shallow water samples also contained *M. sciuri*. All detected *M. sciuri* strains proved to be multidrug resistant, since they showed resistance to at least three classes of antimicrobials. The antibiotics to which the most bacterial isolates were resistant were benzylpenicillin, clindamycin, and fusidic acid. Unfortunately, we also detected *M. sciuri* isolates with cefoxitin and oxacillin resistance, which is considered as an indicator of methicillin resistance. These strains could be isolated from shallow water but not from nasal swab specimens. Molecular comparison of the two types of samples is in progress.

As a conclusion of our study, we can ascertain that wild boar is a good target to assess antimicrobial resistance in natural habitats. The bacterial species *M. sciuri* also proved to be a promising screening tool for evaluation of ecosystem health, whereas it can be isolated easily, in high prevalence, and it possesses more phenotypic characteristics of antimicrobial resistance. We believe that a bacterial surveillance in wild boar to detect *M. sciuri* and its antimicrobial susceptibility can be a good tool to estimate the influence of human activity on ecosystem health.