Title:

The influence of snail host microbiome in trematode parasite resistance

Authors:

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Abstract:

Snail-borne diseases affect more than 300 million people worldwide but also lead to economic losses and mortality in livestock. Schistosomiasis is one of the most prevalent tropical infections in Africa, affecting almost 200 million people in Sub-Saharan Africa. The realization that mass drug treatment alone does not suffice to control the disease, renewed the focus on snail control. The control of snail populations is often attempted through molluscicides. These chemicals have, however, detrimental effects on the aquatic ecosystem, thus new sustainable methods are needed. Recent preliminary research pointed to a potential link between the microbiome of the snail intermediate host and its resistance to schistosome infection. Therefore, we aim to test such a relationship by analysing microbial diversity through 16S metabarcoding on naturally and experimentally infected snails. However, before we can identify a potential role of the microbiome in parasite resistance, we must first build a better understanding of the microbiome of snails based on snail phylogeny, biogeography and infection status. We will, furthermore, assess temporal variation in the snails’ microbiome based on museum and fresh samples. Finally, we will validate the correlative results in a transplant experiment where axenic snails (recipients) with field-based microbiomes (donors) are exposed to parasite treatments. Here we discuss the relevant study design, the preliminary 16S metabarcoding results, and the preparatory protocol to obtain axenic snails. Our results could alter disease control measures towards non-lethal probiotic treatments, limiting the use of detrimental molluscicides.