

**Title:**

Onion thiosulfinate resistance in Enterobacter strains

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**Abstract (300 words maximum):**

Garden onion (*Allium cepa*) is one of the most important vegetables in the world and has been reported to have diverse health benefits for humans. It is known for its antimicrobial effects, mainly caused by thiosulfinates, which are formed when onion cells are damaged. Despite this defense mechanism, certain bacterial pathogens can still cause bulb rot in onions. Enterobacter is one of the genera described as an onion pathogen and is frequently isolated from infected bulbs. In this study, we investigated the growth of Enterobacter strains from various sources in the presence of onion thiosulfinates and aimed to identify the genes responsible for the resistance against thiosulfinates.

Liquid cultures with and without onion extract were carried out for several strains to test for an inhibitory effect. Additionally, the genomes of these strains were sequenced to identify relevant genes. Using bacterial GWAS, genes were identified that are homologous to the alt cluster previously described in *Pantoea* and *Burkholderia* spp., but with different gene content and cluster order. The identified gene clusters are abundant in the genomes of Enterobacter strains belonging to different species isolated from onions, but also in isolates from other sources. RT-qPCR confirmed enhanced expression of *altA* in the presence of onion extract. However, the specific compounds responsible for its regulation remain unclear and will be further investigated. Analysis of an *E. ludwigii* strain, that lost its plasmid containing the alt gene cluster, showed a significant increase in lag time in the presence of thiosulfinates comparable to strains lacking an alt cluster. Future work will involve complementation of this strain with a minimal alt cluster set to confirm the functionality of the genes involved.