

Abstract

Globodera pallida are microscopic, soil-dwelling nematodes. They infect potatoes causing damage to the roots. *Caenorhabditis elegans* are a model organism for parasitic nematodes. Emodepside targets the SLO-1 channel, which is a calcium-gated potassium channel expressed at the neuromuscular junction in *C. elegans*. This study characterizes the difference in emodepsides effect on *G. pallida* and *C. elegans*.

Comparisons were made between motility, stylet thrusting, pharyngeal pumping, hatching, development, and emodepsides effect on *C. elegans* and *G. pallida* SLO-1 channels in a *C. elegans* SLO-1 null mutant background.

Emodepside inhibited motility, stylet thrusting in *G. pallida* and pharyngeal pumping in *C. elegans*. The EC₅₀ for *G. pallida* after 3 hours was 636nM (n=4, 30 worms per repeat), the EC₅₀ for *C. elegans* was 2.9μM (n=12). Stylet thrusting and pharyngeal pumping were found to be inhibited by 1μM emodepside. Hatching assays with *G. pallida* showed that emodepside affects hatching at higher doses (≥5μM) but the development assay with *C. elegans* stopped development at 500nM. *G. pallida* SLO-1 gene was expressed in *C. elegans* SLO-1 null mutant background. The reversals phenotype was rescued, and the emodepside sensitivity was partially rescued.

Emodepside has been shown to target SLO-1 in *G. pallida* and *C. elegans*. The results open up new avenues of research for using SLO-1 as a target in the first line of defense for potatoes.