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Publication date:
2015

Document Version
Peer reviewed version

Citation (APA):
ANTHELMINTIC ACTIVITY OF SESQUITERPENE LACTONES FROM FORAGE CHICORY AGAINST ASCARIS SUUM

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Introduction
New control options for parasitic nematodes are needed due to the threat of drug resistance and consumer demand for organic animal products. Chicory is a nutritious forage that can be used for grazing outdoor-reared pigs and ruminants and may have anthelmintic effects, potentially due to high concentrations of sesquiterpene lactones (SL). Here, we investigated the effects of SL extracts from chicory on in vitro survival and glutathione-S-transferase (GST) activity of the highly prevalent pig parasite Ascaris suum.

Materials and Methods
Chicory leaves from two cultivars (Spadona and Puna II) were extracted with methanol and SL purified by solid-phase extraction. UPLC-MS was used for analysis of the extracts. A. suum third-stage larvae (L3) were produced by in vitro hatching of eggs, whilst L4 were isolated from the gut of infected pigs. Native A. suum GST protein was purified and activity was assessed by the CNDB assay.

Results
Incubation in the SL extracts dramatically reduced the in vitro survival of A. suum L3 and L4. However, the effect was cultivar-dependent, with Spadona extracts more potent than Puna II, consistent with distinct SL profiles observed between cultivars. Spadona-SL also strongly inhibited the activity of A. suum GST, suggesting that the anthelmintic mechanism may involve accumulation of toxic reactive oxygen.

Conclusion
If the observed anthelmintic effects are confirmed in vivo, chicory has potential to be used as an alternative control for A. suum in outdoor pigs, although selection of appropriate cultivars will be important. On-going experiments are investigating the mechanism(s) of anthelmintic action.