

Technical University of Denmark



Sesquiterpene lactone-containing extracts from two chicory cultivars show different anthelmintic activity in vitro against *Ostertagia ostertagi*

Pena-Espinoza, Miguel Angel; Boas, Ulrik; Williams, Andrew; Thamsborg, Stig M.; Enemark, Heidi

Published in:

25th International Conference of the World Association for the Advancement of Veterinary Parasitology

Publication date:

2015

Document Version

Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Pena-Espinoza, M. A., Boas, U., Williams, A., Thamsborg, S. M., & Enemark, H. (2015). Sesquiterpene lactone-containing extracts from two chicory cultivars show different anthelmintic activity in vitro against *Ostertagia ostertagi*. In 25th International Conference of the World Association for the Advancement of Veterinary Parasitology: Abstract Book (pp. 298-298). Liverpool, United Kingdom.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Oral poster session 1: We can work it out

Tuesday 18 August
10:00-10:30

Ref: 0640

Poster Number: P2C327

Sesquiterpene lactone-containing extracts from two chicory cultivars show different anthelmintic activity *in vitro* against *Ostertagia ostertagi*

Miguel Peña-Espinoza^{1,2}, Ulrik Boas¹, Andrew Williams², Stig Thamsborg², Heidi Enemark^{1,3}

¹National Veterinary Institute, Technical University of Denmark, Copenhagen, Denmark,

²Department of Veterinary Disease Biology, University of Copenhagen, Copenhagen, Denmark,

³Norwegian Veterinary Institute, Oslo, Norway

Mechanisms behind reported *in vivo* anthelmintic effects of chicory (*Cichorium intybus*) in ruminants are poorly understood but it is likely that plant compounds, like sesquiterpene lactones (SL), play a role. **Objectives:** The aim was to test the inhibitory activity of SL-containing extracts from two chicory cultivars on free-living and parasitic stages of *Ostertagia ostertagi*. **Methods:** Leaves from chicory cv. Spadona and cv. Puna II were freeze-dried and SL extracted with methanol/water. Resulting extracts were incubated with cellulase enzyme and SL were purified from other plant compounds by normal solid-phase extraction. Purified extracts were dissolved in DMSO. *O. ostertagi* eggs from a mono-infected calf were hatched and first-stage larvae (L1) were used in a larval feeding inhibition assay (LFIA), while L3 cultured from faeces were used in a larval exsheathment inhibition assay (LEIA). *O. ostertagi* adult worms recovered post-mortem were used for motility inhibition assays (AMIA) and worm motility was evaluated after 6, 24 and 48 h of incubation (37°C). In all *in vitro* assays, decreasing concentrations of chicory extracts in PBS (1% DMSO) were tested in triplicates with 1% DMSO in PBS as negative controls. Chemical profiles of the extracts were analysed by liquid chromatography (LC). **Results:** In the LFIA, Spadona-extract inhibited larval feeding at significantly lower concentrations than Puna II-extract ($EC_{50}=31.5$ [CI=25.9-38.3] μ g Spadona-extract/mL vs. $EC_{50}=121.1$ [CI=95.2-153.8] μ g Puna II-extract/mL; $p<0.0001$). In the LEIA, extracts from neither of the two cultivars interfered with the exsheathment of L3 at any of the tested concentrations. In the AMIA, Spadona-extract showed a significantly higher potency and exerted faster worm paralysis than Puna II-extract at all time points when tested at equal concentrations ($p<0.0001$). Preliminary LC analyses revealed different SL profiles of the extracts and further chemical characterization is undergoing. **Discussion:** This is the first study confirming direct effects of SL against *O. ostertagi*. However, the observed anthelmintic effects of SL-containing extracts from chicory seem to be stage-specific as L1 and adult *O. ostertagi* but not L3 were affected. Different anthelmintic potency of SL from different chicory cultivars may help the identification of the most active(s) molecule(s) and the selection of cultivars with higher antiparasitic potential.