

The Effects of *Pteridium esculentum* (Austral Bracken) on *Haemonchus contortus* Larval Development

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Gastrointestinal nematode infections cost the Australian sheep and wool industry billions annually with the increase in anthelmintic resistance causing the current chemical treatments to be less effective. Natural plant products have been used for centuries by Indigenous groups and could be utilised to identify novel drug candidates. *Haemonchus contortus* is not only an agricultural significant nematode but can also be utilised for anthelmintic drug discovery.

The objective of the study was to investigate extracts of *Pteridium esculentum* against *Haemonchus contortus* larval development to determine if it is a possible anthelmintic drug candidate. This experiment considers Australian Indigenous knowledge regarding the part of the plant used and traditional preparation as well as modern extraction and identification methods and toxicity analysis.

Four extracts were made from mature fronds and the roots; two methanol based extracts, root tea and a frond hydrosol. The frond extract had a SI value of 5.3 and IC₅₀ value of 14.6 µg/mL compared to the root extract that had an IC₅₀ of 9.7 µg/mL and SI of 3.6. The root tea needed a 1:310 dilution to inhibit 50% of larval development. The frond hydrosol produced inconsistent larval development results but had the highest number of biologically significant compounds.

Benzothiazole, is a natural product, which was matched using HS-SPME and due to its structure relatability to a known anthelmintic could be a potential lead.

Although *P. esculentum* has known toxicity associated with the consumption of fresh fronds, through consideration of seasonality, environmental conditions and fractionation, the fronds may be a potential anthelmintic lead.