

Phytochemical profile and anthelmintic effects of *Laurus nobilis* essential oil against the ovine nematode *Haemonchus contortus* and the murine helminth model *Heligmosomoides polygyrus*

Abstract

Small ruminant production in tropical and temperate countries faced substantial anthelmintic resistance due to the intensive use of commercial anthelmintic drugs. Therefore, alternative treatments including natural bioactive compounds with anthelmintic potential have been investigated looking for its successfully use in the parasite control. In the present study, we describe the chemical profile of *Laurus nobilis* essential oil (EO), the *in vitro* anthelmintic activity of *L. nobilis* EO against *Haemonchus contortus* and its *in vivo* anthelmintic effect against the murine helminth parasite model *Heligmosomoides polygyrus*. Egg hatch assay (EHA) and Adult Worm Motility (AWM) assay were used to assess the *in vitro* anthelmintic activity of *L. nobilis* EO at the concentrations of 0.25; 0.5; 1; 2; 4 and 8 mg/mL against *Haemonchus contortus*. Moreover, *L. nobilis* EO at the concentrations of 300, 600 or 1200 and 2400 mg/kg were evaluated *in vivo* in mice infected with *Heligmosomoides polygyrus*. The *in vivo* anthelmintic efficacy was monitored using faecal egg count reduction (FECR) and total worm count reduction (TWCR). The *in vitro* anthelmintic potential was expressed by an ovicidal effect against *H. contortus* egg hatching with inhibition value of 1.72 mg/mL and 87.5 % of immobility of adult worms after 8 hours of exposure to 4 mg/mL of *L. nobilis* EO. Regarding, the *in vivo* anthelmintic potential, *L. nobilis* (EO) at 2400 mg/kg bw completely eliminated the egg output of *H. polygyrus* after 7 days of oral treatment, together with a 79.2% of reduction in total worm counts. Based on the obtained results, *L. nobilis* EO showed promising *in vitro* and *in vivo* anthelmintic capacities and could be a possible candidate for the control of worm parasites in livestock.