

## FORMULATIONS CONTAINING ESSENTIAL OILS: POTENTIAL FOR ANTHELMINTIC ACTIVITY AGAINST SHEEP GASTROINTESTINAL NEMATODE

### POTENCIAL ANTI-HELMÍNTICO DE FORMULAÇÕES CONTENDO ÓLEOS ESSENCIAIS EM NEMATÓIDES GASTROINTESTINAIS DE OVINOS

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Improper use of chemicals for the *Haemonchus contortus* control resulted in the emergence of resistant strains. The combination of two or more bioactives, synthetic or natural, have superior effects when in comparison to single compounds, resulting in reduced doses and low toxicity of the user. In this study, Cinnamaldehyde, Carvone, Carvacrol and Anethole essential oils were combined as follow: 1) Cinnamaldehyde (25%) + Carvone (50%) + Anethole (25%), 2) Cinnamaldehyde (50%) + Carvone (25%) + Carvacrol (25%) and 3) Cinnamaldehyde (25%) + Carvacrol (25%) + Anethole (25%) + Carvone (25%). Each formulation (12.48 µl) was solubilized with detergent Tween 80 (100 µl) and added 5887.52 µl of distilled water to make the main solution for in vitro hatchability test of *H. contortus* eggs. Decreasing concentrations of these formulations were tested (2.08 mg/ml; 1.04 mg/ml; 0.39 mg/ml; 0.15 mg/ml; 0.06 mg/ml; 0.02 mg/ml; and 0.007 mg/ml) in 100 eggs of *H. contortus* (6 replicates) in 48-well plate, and incubated for 24 hours at 27° C to evaluate their effectiveness. Data were analyzed with SAS Probit (SAS Inst., Inc., Cary, NC) estimating the LC<sub>50</sub> and the independent variables (Table 1). It was concluded that the formulation 1 had the lowest LC<sub>50</sub> of 0.020 mg/ml, suggesting better anthelmintic efficacy, followed by formulation 2, LC<sub>50</sub> of 0.028 mg/ml and formulation 3 that showed worst efficacy with LC<sub>50</sub> of 0.045 mg/ml.

Table 1. Results of *in vitro* test from 3 formulations against eggs of *Haemonchus contortus*

FORMULATION	Doses mg/mL	2.08	1.04	0.39	0.15	0.06	0.02	0.007	LC <sub>50</sub> mg/mL
		Percentage of Inhibition (%)							
Cinamal(25%)+ Carvacrol(50%)+ Anethole (25%)		100	100	100	100	56.75	8.98	7.61	0.020
Cinamal (50%)+ Carvone (25%)+ Carvacrol (25%)		100	100	100	100	94.8	20.2	4.75	0.028
Cinamal (25%)+ Carvacrol (25%)+ Anethole (25%)+ Carvone (25%)		100	100	100	100	99.05	37.28	9.97	0.045

Keywords: essential oils, *Haemonchus contortus*, sheep.

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