

Evaluation of *Cistus ladanifer* L. effect on gastrointestinal parasites in lambs

Inês Delgado^{a,*}, Sara Tudela Zúquete^{a,b,*}, David Soldado^c, Olinda Guerreiro^{b,c}, Eliana Jerónimo^{b,c}, Ludovina Neto Padre^b

* Both authors equally contributed to this work

^a Centro de Investigação Interdisciplinar em Sanidade Animal (CIISA), Faculdade de Medicina Veterinária, Universidade de Lisboa, Avenida da Universidade Técnica, 1300-477 Lisboa, Portugal; ^b ICAAM, Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Apartado 94, 7006-554 Évora, Portugal; ^c Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo (CEBAL)/Instituto Politécnico de Beja (IPBeja), 7801-908 Beja, Portugal.

Introduction

Cistus ladanifer L. (Cistaceae) is a bountiful available shrub at the western Mediterranean region, including the south of France, Spain, Portugal and the north of Morocco. It is commonly observed in uncultivated fields.

This perennial shrub contains low protein levels and high levels of phenolic compounds, such as condensed tannins (CT). It has a low organic matter digestibility, which, enhanced by its anti-nutritional components results in a poor nutritional value. However, either by natural grazing or by encouraged consumption, the incorporation of *Cistus ladanifer* L. in small ruminants' diet may simultaneously act as an important feeding complement as it can transform this shrub into a high-level end-use product.

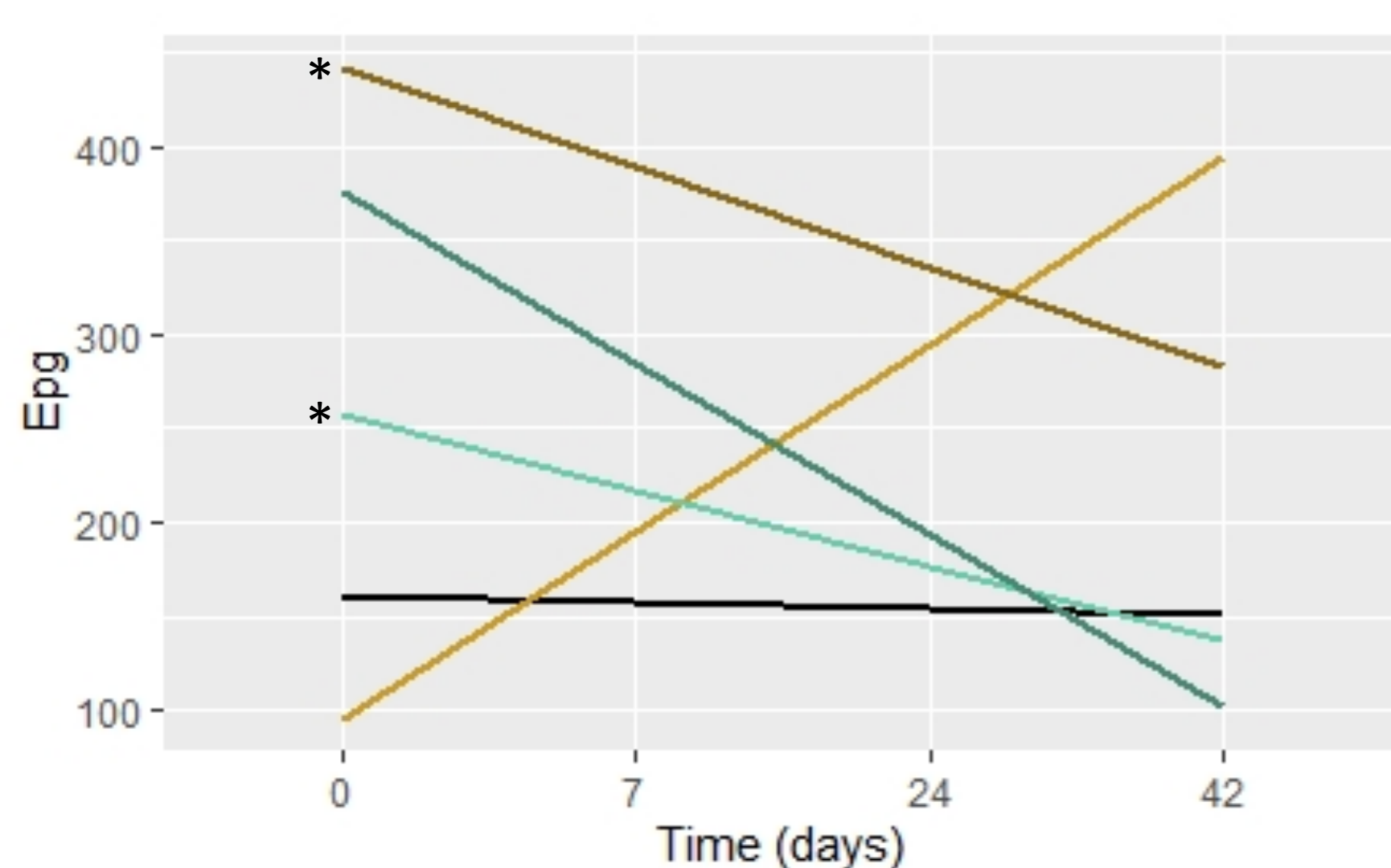
Aim

The present work focuses on the determination of *Cistus ladanifer* L. (Cistaceae) composition effect on gastrointestinal parasites.

Conclusions

- Both *C. ladanifer* aerial parts and CT extract demonstrated an effect on strongylid Epg count, resulting in a reduction in eggs shed over time.
- No effect was detected on coccidia Epg count.
- *C. ladanifer* dietary supplementation is a promising strategy for the control of strongylids in lambs.

Results

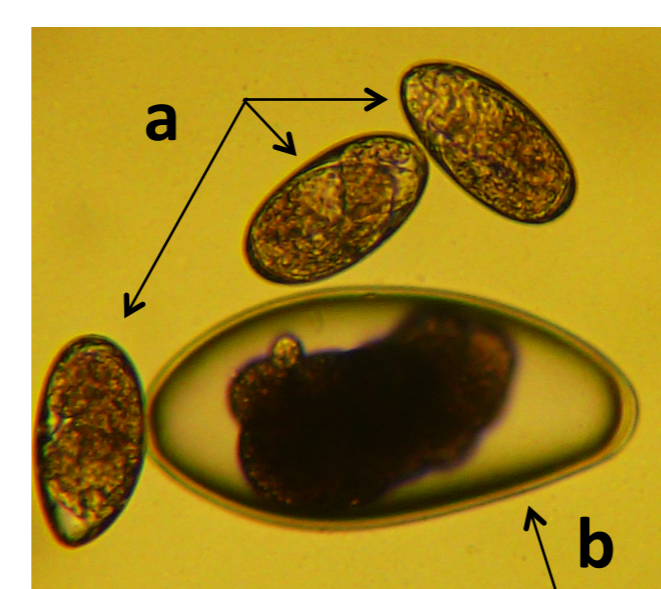


Effect of *C. ladanifer* dietary supplementation on strongylid Epg

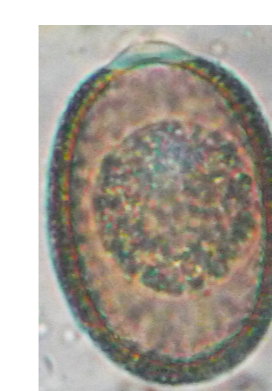
Strongylid Epg count analysis			
Model	Epg ~ Time * Treatment, ~1 animal		
Main effects	Chi²	p-value	
Time	45.0	<0.0001	
Treatment	3.4	0.5	
Time*Treatment	85.9	<0.0001*	
Post hoc	Chi²	p-value	
Control - Aerial parts 1.25%	8.0	0.1405	
Control - Aerial parts 2.5%	21.7	0.0006*	
Control - CT extract 1.25%	21.4	0.0006*	
Control - CT extract 2.5%	7.5	0.1405	



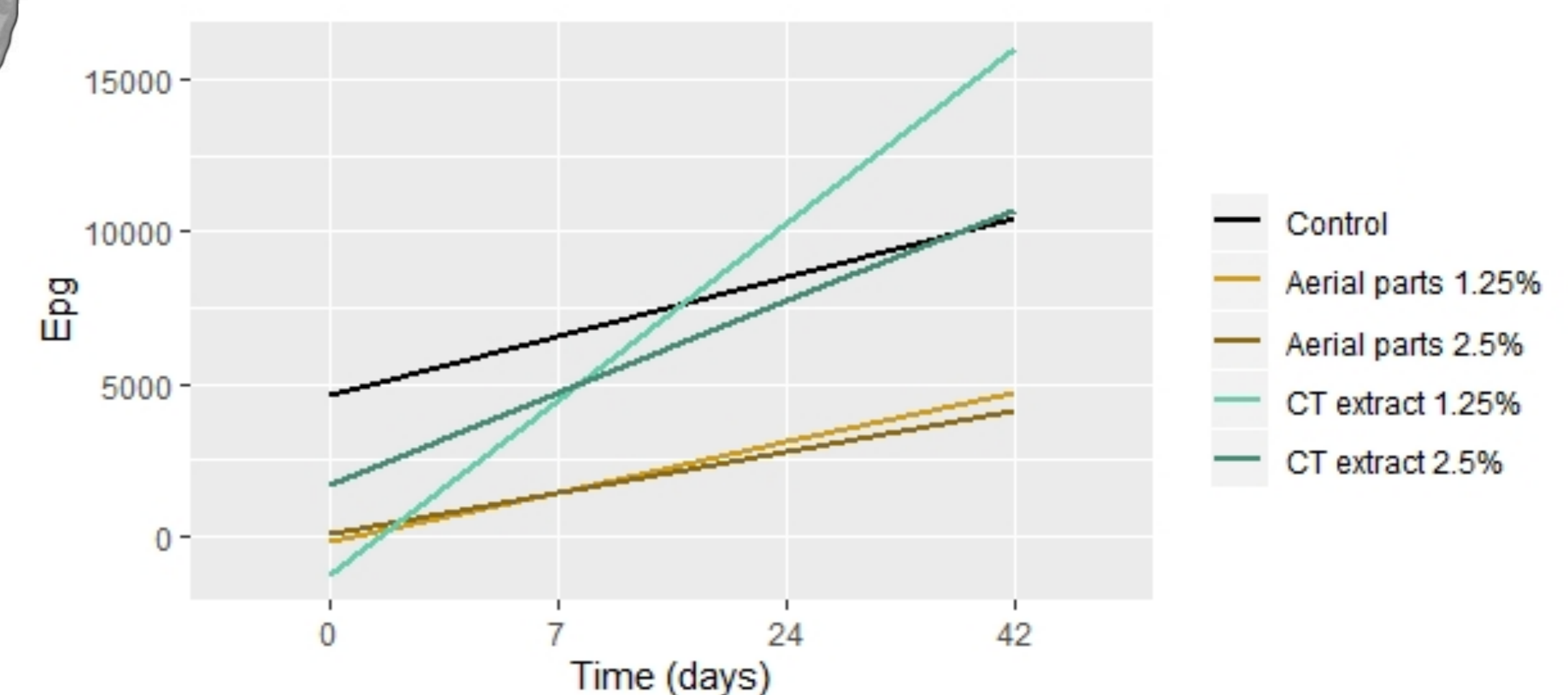
Cistus | Rumen



Gastrointestinal nematodes:
a) Strongylidae eggs ; b) *Nematodirus* sp. egg



Gastrointestinal coccidia (*Eimeria intricata*)



Effect of *C. ladanifer* dietary supplementation on coccidia Epg

Coccidia Epg count analysis			
Model	Epg ~ Time * Treatment, ~1 animal		
Main effects	Chi²	p-value	
Time	3.8	0.2781	
Treatment	4.1	0.3949	
Time*Treatment	3.9	0.9870	

Material and Methods

- 36 ram lambs – crossbred Merino Branco with 19.8 ± 1.86 kg.
- 6 weeks of trial, which included 1 week of adaptation.
- Randomly assigned to individual pens – six pens to each diet.

Diets:

- Three levels of *C. ladanifer* CT - 0, 1.25 and 2.5% of CT
- Two ways of CT supply - *C. ladanifer* aerial parts and *C. ladanifer* CT extract

Dehydrated Lucerne + 60 g/kg soybean oil - **Control**

Control + 125 g/kg *Cistus ladanifer* – **aerial parts 1.25%**

Control + 250 g/kg *Cistus ladanifer* – **aerial parts 2.5%**

Control + 20.5 g/kg *C. ladanifer* CT extract - **CT extract 1.25%**

Control + 41 g/kg *C. ladanifer* CT extract - **CT extract 2.5%**



Cistus ladanifer



Cistus ladanifer CT extract

- 4 stool collections from each animal
 - before dietary treatment application (day 0);
 - at the end of the adaptation period of diets (day 7);
 - at days 24 and 42 of the trial.
- Coprological techniques applied included nematode egg (Epg) and coccidian count by a modified **McMaster** technique;
- All samples were also evaluated by direct microscopic observation by the **Willis fluctuation** method.

- The data was analyzed using a generalized linear mixed model procedure to identify a significant interaction of treatment groups over time regarding the strongylid Epg count, through the Penalized Quasi-Likelihood parameter estimation method. The Holm adjustment method was used for pairwise contrast tests.

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