IN VIVO ASSESSMENT OF THE ANTIPARASITIC EFFECTS OF *ALLIUM SATIVUM* L. AND *ARTEMISIA ABSINTHIUM* L. AGAINST DIGESTIVE PARASITES IN SWINE

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INTRODUCTION

Parasitic diseases cause significant economic losses in pig farming, mainly by increased morbidity and mortality indicators as well as by decreased productive and reproductive efficiency. Due to continuously increasing drug resistence in parasites and prohibited use of antiparasitic medications in organic pig farming practices, phytotherapy could represent a valid, biologically available and cost effective alternative for parasite control. The use of phytotherapeutic remedies has notably increased over the past decade due to their biodegradability, decreased toxicity, environmentally friendliness, and to some extent their antiparasitic effect.

Fig. 1. Picture showing a low-input farm.

AIMS

The present study was designed to assess the antiparasitic potential of *Allium sativum*, and *Artemisia absinthium*, on naturally occurring digestive parasites of swine in two free-range (low-input) farms from Transylvania.

MATERIALS AND METHODS

High performance liquid chromatography coupled with mass spectrometry (HPLC/MS) was used for the analysis of biologically active compounds present in the plant extracts.

For each farm and plant were established 3 control groups (10 weaners, 10 fatteners and 10 sows) and 3 experimental groups. The last one received *A. sativum* in a dosage of 180 mg/kg bw/day and *A. absinthium* in a dosage of 90 mg/kg bw/day for 10 consecutive days.

The coproparasitological examination was then performed using the following methods: flotation (McMaster, Willis), active sedimentation, modified Ziehl-Neelsen stained fecal smear, modified Blagg technique and oocysts/eggs cultures.

Faecal egg count reduction test (FECRT) was used to ascertain the antiparasitic efficacy of *A. sativum* and *A. absinthium* and faecal egg count reduction (FECR) was reported.

Fig. 2. All the materials necessary for the coproparasitological methods.

RESULTS

Following chemical analysis of the alcoholic plant extracts, the main biologically active compounds identified were: polyphenols, tocopherols, sulfoxide for *A. sativum* and polyphenols, tocopherols, sterols, methoxylated flavones, sesquiterpene lactones for *A. absinthium*.

The examination revealed parasitic infections with *Balantioides coli*, *Eimeria* spp., *Cryptosporidium* spp., *Ascaris suum*, *Trichuris suis*, *Oesophagostomum* spp. and *Strongyloides ransomi*.

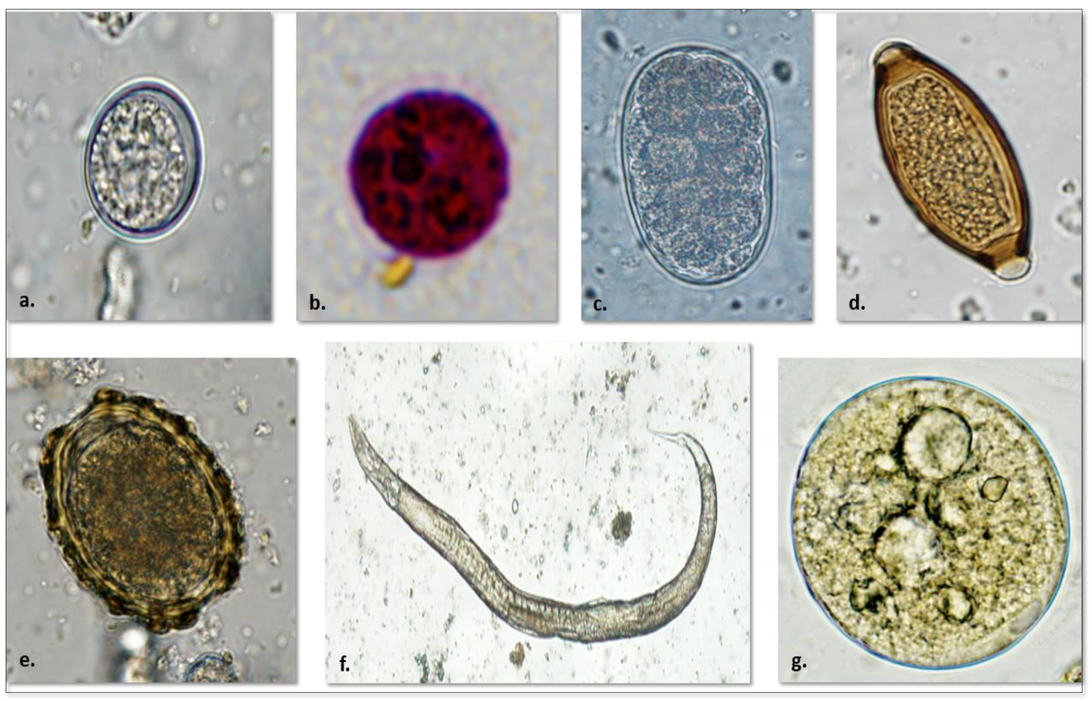

Fig. 3. Coproparasitological examination results: **a-** *Eimeria spp.* oocyst, **b-** *Cryptosporidium* spp. cyst, **c-** *Oesophagostomum spp.* egg, **d-** *T. suis egg*, **e-** *A. suum* egg, **f-** *S. ransomi* female and **g-** *B. coli.*

Table 1. Percentage of faecal egg/oocyst/cyst count reduction (%) recorded on days 14, and 28 post-treatment in F1 and F2 farms (using FECR formula)

Parasite	*A. sativum* (14)						*A. sativum* (28)					
	Weaners		Fatteners		Sows		Weaners		Fatteners		Sows	
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2
Eimeria spp.	76.7	82.1	62.1	79.6	**100**	**100**	88.1	84.6	**20.0**	84.1	78.9	83.5
B. coli	59.8	74.2	**76.1**	75.1	82.3	66.3	**47.9**	72.3	66.7	69.8	55.8	67.8
A. suum	-	-	82.3	79.8	**87.6**	72.1	-	-	84.7	86.3	68.2	**62.8**
T. suis	-	-	66.7	**76.6**	-	-	-	-	63.9	**54.1**	-	-
Oesophagostomum spp.	**100**	-	-	-	**100**	87.5	88.7	-	-	-	67.3	**45.8**
S. ransomi	64.4	-	**100**	-	**100**	-	**57.3**	-	**100**	-	**100**	-
Parasite	*A. absinthium* (14)						*A. absinthium* (28)					
	Weaners		Fatteners		Sows		Weaners		Fatteners		Sows	
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2
Eimeria spp.	74.2	84.0	71.8	**33.1**	65.8	92.4	71.5	84.9	85.1	**100**	56.3	89.8
B. coli	72.1	**88.4**	60.3	37.7	58.7	88.0	63.3	80.6	46.9	71.9	**31.6**	85.1
A. suum	-	-	71.3	64.9	44.7	**80.5**	-	-	70.4	64.3	**30.2**	78.6
T. suis	-	-	50.4	**39.5**	-	-	-	-	49.9	**79.2**	-	-
Oesophagostomum spp.	33.2	-	-	-	49.5	63.1	**25.1**	-	-	-	43.8	**66.7**
S. ransomi	36.2	-	-	-	44.4	-	**31.3**	-	-	-	**69.1**	-

CONCLUSIONS

This experiment was conducted between April and July 2021, on two free-range (low-input) Transylvanian farms, involving pigs of the Bazna and Mangalitza breeds. Both plant powders at the previously mentioned doses for 10 consecutive days had a strong antiprotozoal and anthelmintic activity, with *A. sativum* being more effective. *A. sativum* and *A. absinthium* have the potential of treating gastrointestinal parasitosis in swine. The antiparasitic efficacy can be attributed to the presence of polyphenols, tocopherols, flavonoids, sesquiterpene lactones and sulfoxide.

ACKNOWLEDGMENTS

This research was supported by University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca (USAMV Cluj-Napoca), and by the project PPILOW. The project PPILOW has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°816172.