



Saponins-citroflavonoids based solution reduced by 70% the growth of *Histomonas meleagridis*: an in vitro study.

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Introduction

Histomonas meleagridis is a flagellate protozoan parasite living in the caecum of the digestive system of birds. It is the causative agent of histomonosis or commonly known as “Blackhead disease” in turkey. While chicken are asymptomatic carriers of the parasite, the effect on turkey is more dramatic. Indeed, the mortality due to this infestation can reach 80 to 100% leading to important economic losses. Feed supplementation with plant-based solutions can be considered as a part of a global management for modern turkey producers. This study was performed in order to assess the *in vitro* effect of active compounds of Citronin XO (CXO), a saponin-citroflavonoids based solution developed by Nor Feed SAS; France, on the growth of *H. meleagridis* and compare their effects to metronidazole.

Material and methods

100,000 *H. meleagridis* cells grown in log phase were added to Dwyer’s media with the compound to be tested and incubated at 40°C for 48 hours. Metronidazole a 12.5 ppm was used as a positive control, while media was used as a negative control. CXO solution was applied at 500 ppm. Counts was performed using a Neubauer hemocytometer. 3 replications per treatment and each replicate was counted 4 times. Statistical analysis was performed by one-way ANOVA test using Graph pad Prism software. Statistical significance was considered at $p < 0.05$.

Treatment	Concentration	Duration
1	Negative Control (0 ppm)	48h
2	Positive Control (Metronidazole 12.5 ppm)	48h
3	500 ppm (Citronin XO)	48h

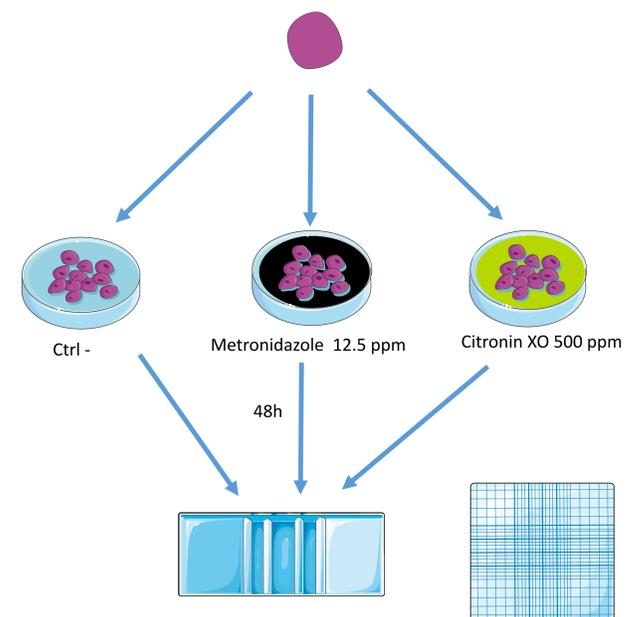
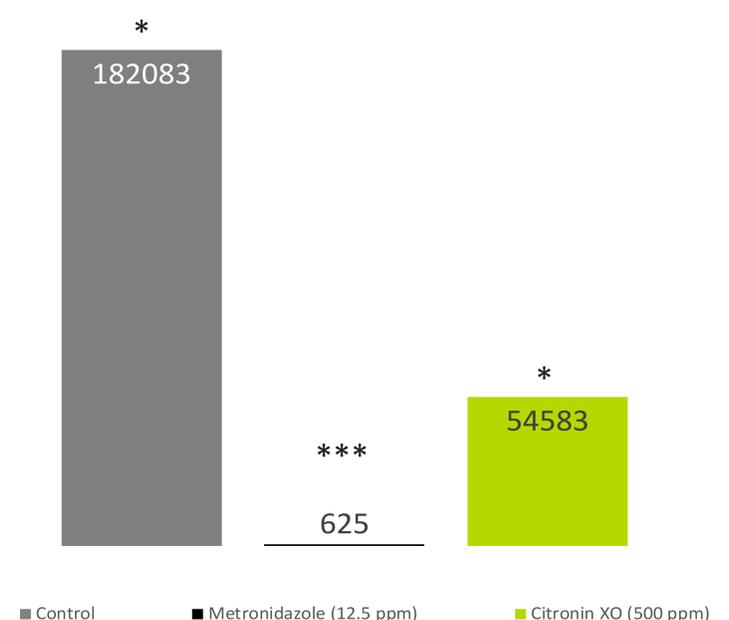


Figure 1: Experimental design

Results

Average Cell Concentration per Treatment (Histomonads/ml)



As expected, incubation with metronidazole reduced the growth by 99.65% ($P < 0.001$) compared to control. Active compounds of CXO, namely saponins and citroflavonoids, were able to reduce the growth by 70% compared to control after incubation with the parasite ($P < 0.05$).

* $P < 0,05$ compared to control

*** $P < 0,002$ compared to control

Conclusion

Results from this in vitro study showed that saponins and citroflavonoids active compounds of CXO reduced the growth of the causative agent of blackhead disease by 70% in these experimental conditions. These results support the fact that feed supplementation with CXO could contribute to improve turkeys’ gut health and reduce antimicrobial use in livestock. *In vivo* studies with and/or without parasite challenge are needed to confirm this *in vitro* results.