

# Anticoccidial and antiinflammatory activity of garlic in murine *Eimeria papillata* infections

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## Abstract

Coccidiosis with the protozoan parasite *Eimeria* as the infectious agent causes enormous economic losses, particularly in poultry farms. Here, we investigated the effects of garlic on the outcome of coccidiosis caused by *Eimeria papillata* in male Balb/c mice. The data showed that mice infected with *E. papillata* revealed an output of  $3260 \pm 680$  oocysts per gram faeces on day 4 p.i.. This output is significantly decreased to  $1820 \pm 415$  oocysts in garlic-treated mice. Infection also induced inflammation and injury of the liver. This was evidenced (i) as increases in inflammatory cellular infiltrations, dilated sinusoids, and vacuolated hepatocytes, (ii) as increased mRNA levels of inducible nitric oxide synthase (iNOS) and of the cytokines interferon gamma (IFN- $\gamma$ ), and interleukin-6 (IL-6), (iii) as increased plasma levels of alanine and aspartate aminotransferases, alkaline phosphatase,  $\gamma$ -glutamyl transferase and total bilirubin,

(iv) as increased production of nitric oxide derived products (nitrite/nitrate) and malondialdehyde, and (v) as lowered glutathione levels and decreased activities of catalase and superoxide dismutase, respectively. All these infection-induced parameters were significantly less altered during garlic treatment. In particular, garlic counteracted the *E. papillata*-induced loss of glutathione and the activities of catalase and superoxide dismutase. Our data indicated that garlic treatment significantly attenuated inflammation and injury of the liver induced by *E. papillata* infections.

## Keywords

- Garlic;
- Coccidiosis;
- Anticoccidium;
- Anti-inflammatory activity

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