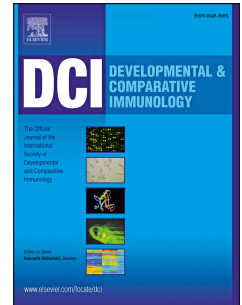


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# Invertebrate Host Responses to Microsporidia Infections

Guoqing Pan<sup>a</sup>, Jialing Bao<sup>a</sup>, Zhengang Ma<sup>b</sup>, Yue Song<sup>a</sup>, Bing Han<sup>a</sup>, Maoshuang Ran<sup>a</sup>, Chunfeng Li<sup>a</sup>, Zeyang Zhou<sup>a,b\*</sup>

<sup>a</sup>State Key Laboratory of Silkworm Genome Biology, Southwest University, Chongqing 400716, P. R. China

<sup>b</sup>College of Life Sciences, Chongqing Normal University, Chongqing 401331, P. R. China

## Abstract

Microsporidia are a group of fungi-like intracellular and unicellular parasites, which infect nearly all animals. As the “master parasites”, more than 1400 microsporidian species were described. Microsporidia infections in economical invertebrates (*e.g.*, silkworm, shrimp) caused huge losses, while other microsporidia infections in daphnia, nematode, locust, honeybee and mosquito play important roles in the regulation of their population size. Researches on the invertebrate host responses to Microsporidia infections obtained plenty of interesting results, especially in the innate immune response to these pathogens. In this review, we comparatively summarized the invertebrate host responses to various microsporidia infections. We discussed numerous critical events in host responses including ubiquitin-mediated resistance, production of reactive oxygen species, melanization and innate immune pathways, in addition to the increased basic metabolism and the accumulation of juvenile hormone in hosts. Moreover, a number of novel progresses in Microsporidia infection were also addressed. Collectively, these advances shed more lights on general rules of invertebrate host immune responses and pathogenesis mechanisms of Microsporidia, and also offer valuable clues for further researches on the crosstalks between hosts and intracellular pathogens.

**Key words:** Microsporidia; Invertebrate; Host response; Innate immunity; Insect

\*Corresponding author: Zeyang Zhou, zyzhou@swu.edu.cn

## Introduction

Microsporidia are a group of fungi-related unicellular parasites that lead an obligate intracellular parasitic life. *Nosema bombycis* (*N. bombycis*) was described as the first

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