

How do trematode clones differ by fitness-related traits and interact within the host?

Ekaterina Mironova¹, Sergei Spiridonov¹, Danila Sotnikov², Anastasiya Shpagina², Kseniia Savina¹, and Mikhail Gopko¹

¹A N Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences

²Russian State Agrarian University Moscow Timiryazev Agricultural Academy

April 19, 2024

Abstract

Polyclonal infections are widespread and provide evidence of facilitation, competition, and neutral interactions between parasite clones, even within the same host-parasite system. The outcome of co-infections is usually assessed by parasite infection intensities, while other important fitness-related traits, e.g. larval growth rates, are often ignored. We studied both infectivity and the growth rate of different clones of the common trematode *Diplostomum pseudospathaceum* in the fish host (*Salvelinus malma*) and tested how these fitness-related traits changed in double-clone infections compared to single-clone ones. We found that the growth rates of the parasite's clones were more variable than their infectivity. The relationships of these *D. pseudospathaceum* traits with host mass were clone-specific. Some clones demonstrated higher infection intensities and growth rates in larger fish. It hints that specialization on different size groups of hosts may occur in this parasite species. In addition, we found positive density-dependent growth (Allee effect), rarely reported for parasites. Interestingly, it was observed only in mixed infections and we discuss the reasons for it. In double-clone infections, both evidence of facilitation and competition between *D. pseudospathaceum* clones were found. The outcome of co-infections varied not only between genotype combinations but also between tested traits. Clones either 'cooperated' when infecting the host or competed when growing. There were no clone pairs, in which interactions changed their type with time or were observed constantly during parasite development.

Hosted file

Mironova et al_ms_submission ME.doc available at <https://authorea.com/users/771869/articles/856258-how-do-trematode-clones-differ-by-fitness-related-traits-and-interact-within-the-host>