
Resource quality modulates both infection success and intensity in the amphipod *Gammarus pulex* infected by an acanthocephalan parasite.

Kevin Sanchez-Thirion^{*†1}, Vincent Felten, Jean-Nicolas Beisel^{2,3}, and Michaël Danger

¹Laboratoire Interdisciplinaire des Environnements Continentaux (LIEC) – CNRS : UMR7360, Université de Lorraine, LTER - Zone Atelier du bassin de la Moselle – Campus Bridoux, 8 Rue du Général Delestraint, F-57070 Metz, France

²Ecole Nationale du Génie de l'Eau et de l'Environnement de Strasbourg (ENGEES) – Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt – 1 Quai Koch, 67070 Strasbourg, France

³Laboratoire Image Ville Environnement (LIVE) – université de Strasbourg, CNRS : UMR7362 – 3, rue de l'Argonne - 67083 Strasbourg cedex, France

Abstract

Most studies dealing with the impact of multiple stresses on aquatic invertebrate take care to keep them in standard conditions (temperature, food, etc). However, resource availability is susceptible to modify organisms' response to stress, especially in host-parasite interactions. Here, we tested the effects of resource quality, and hypothesized that a better resource could benefit the parasite more than his host, leading to higher infection success and intensity.

We manipulated leaf litter quality of a common riparian tree species, the maple (*Acer pseudo-platanus*). We created 3 resource quality sub-groups based on different treatments: sterilized litter discs colonized by aquatic fungi without P addition (Control, C), litter colonized by fungi with short-term P addition (P), and control litter with an additional high quality resource, i.e. benthic diatoms (D). These 3 resource qualities were used to feed individually detritivorous amphipods (*Gammarus pulex*) during 4 months.

These amphipods are the intermediate hosts of several trophic transmitted parasites, as trematodes and acanthocephalans. We performed experimental infections with the acanthocephalan parasite *Pomphorhynchus laevis*, and recorded infection, behavioral and physiological parameters.

Our first results showed that amphipods exhibited a lower mortality rate when fed with the D resource treatment, associated with both higher infection success and intensity, followed by P and control treatments.

These results tend to confirm our hypothesis concerning resource quality influence, but also highlight the benefits of algal resources for both amphipods and parasites, suggesting that any environmental parameter impacting resource quality in streams could thus deeply increase the prevalence/influence of parasites in ecosystems.

*Speaker

†Corresponding author: ksanchez.thirion@gmail.com

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