

Publication

Bacterial infection changes the elemental composition of *Daphnia magna***JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 69894**Author(s)** Frost, P. C.; Ebert, Dieter; Smith, V. H.**Author(s) at UniBasel** [Ebert, Dieter](#) ;**Year** 2008**Title** Bacterial infection changes the elemental composition of *Daphnia magna***Journal** The journal of animal ecology**Volume** 77**Number** 6**Pages / Article-Number** 1265-72**Keywords** ecological stoichiometry, egg, endospore, parasitism, zooplankton**Mesh terms** Animals; Bacteria; Body Composition, physiology; Body Weight; Carbon, metabolism; *Daphnia*, microbiology; Nitrogen, metabolism; Ovum; Phosphorus, metabolism; Spores, Bacterial

1. An animal's elemental composition can be an important indicator of its physiological state and role in ecosystem nutrient cycling. We examined the interactive effects of bacterial (*Pasteuria ramosa*) infection and phosphorus (P)-poor food on the body stoichiometry of *Daphnia magna*. *Daphnia* were exposed to or held free of a bacterial parasite and fed algal food of different C:P ratios (100-500) over a 28-day period. 2. To assess the effects of exposure and infection on *Daphnia* stoichiometry, we measured their whole body content of carbon (C), nitrogen (N), and P on four different days (4, 8, 15, and 28) during the experiment. 3. We found strong effects of infection, food quality, and/or their interactions on the C, N, and P content of *Daphnia*, especially as the infectious disease progressed. At the end of the experiment, infected animals had significantly more C and less P in their bodies than uninfected conspecifics. Body N content of *Daphnia* consuming P-rich food was reduced by bacterial infection whereas *Daphnia* consuming P-poor algae showed increased body N content from infection. 4. Using a mass-balance model, we found that changes in N and P content of host bodies were largely accountable by disease-induced alterations to *Daphnia* reproduction (i.e. bacterial induced sterility) and the accumulation of *Pasteuria* spores in the body cavity. Our calculations also show that the observed increase in host C content could not be accounted for by loss of eggs or accumulation of bacterial spores. This instead must result from unidentified changes to underlying daphnid tissue C content. 5. These results demonstrate that intraspecific variation in zooplankton body stoichiometry can be caused by exposure to and infection by bacterial parasites. In addition, these effects were found to depend both upon the stage of the disease and upon the food quality consumed by the host.

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