

Grazing of the harpacticoid *Paramphiascella fulvofasciata* on freeze-dried diatoms

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In natural ecosystems, copepods are involved in the efficient energy transfer of primary production to higher trophic levels. Copepods graze intensively upon diatoms, an interaction which has been profoundly studied. Diatoms are considered to be a nutritive food source and are commonly used as main food for *ex situ* copepod cultures. Preserving diatoms by freeze-drying can facilitate the copepod culturing process as the maintenance of fresh diatom stocks is not longer required.

During a laboratory experiment, *P. fulvofasciata* was offered a freeze-dried diatom *Seminavis robusta*. Grazing upon freeze-dried cells was compared to grazing upon fresh diatom cells, in a monotonous diet and in a mixed diet. The low uptake of freeze-dried cells indicates that freeze-drying decreases the food quality of a diatom. However, in the mixed diet, this negative selective behaviour of *P. fulvofasciata* towards freeze-dried cells was almost not notable. Solely a complete absence of fresh diatoms induced an aberrant grazing behaviour.

Copepods are capable of distinguishing between low and high qualitative substrates, based on the associated microorganisms. Bacterial community analysis (DGGE) pointed out that the freeze-drying process did not alter the bacterial diversity on the diatom, suggesting that the microorganisms are not responsible for the difference in food quality between the two diatoms. Remarkably bacterial communities on the egested faecal pellets were different among the food source treatments. These bacteria likely originated from the copepod. As harpacticoids are able to switch between food sources (e.g. during food limitation), a hypothesis is that in the absence of a high qualitative food source, *P. fulvofasciata* obtains supplementary nutrients from the faecal pellet bacteria.

Key words: harpacticoid, freeze-dried diatoms, faecal pellets, food quality, bacteria