

Bioactive Copepodamides in Řimov Reservoir, Czech Republic: Ecological Implications for Freshwater Plankton

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Copepodamides are kairomones released by copepods, one of the dominant zooplankton groups in aquatic ecosystems. These cues induce several anti-grazing biological traits in marine phytoplanktons; but their role in the freshwater ecosystem remains an enigma. Hence, a systematic study on copepodamides was carried out from a eutrophic reservoir, Řimov, Czech Republic, during the spring bloom season. A total of 18 different copepodamide chemotypes belonging to the subgroup dihydrocopepodamide (dhCA) were detected, including the first report of four new variants. Out of them, one chemotype 20:1 dhCA was detected for the first time in freshwater. Interestingly despite being present intracellularly, its extracellular relative concentration gradually increased from 0% at the beginning of sampling to 13% at the end. Thus, this chemotype could be a candidate for kairomone activity in freshwater systems. Further, the zooplankton extract from the freshwater reservoir containing dhCA induced a gradual shortening of chain length in the marine diatom *Skeletonema marinoi* in a concentration-dependent manner. Thus, freshwater dhCA appear to have an identical activity to the marine counterpart but it remains unknown if the freshwater algae sense and respond to copepodamides. Overall, future studies on the effect of these kairomones on coexisting phytoplanktons and their underlying biochemical mechanisms may provide new insights into the evolution of anti-grazing traits in the aquatic ecosystem.