UNIVERSITÄT ZU KÖLN

Department für Biologie
Schwerpunkt Ökologie

Zülpicher Str.47b
50674 Köln
Tel.: 0221-4703100
Fax: 0221-4705932

ÖKOLOGISCHES KOLLOQUIUM
des Instituts für Zoologie in person in room 0.024

Wednesday, 11.12.2024, 01:15 pm

Johanna Ahlers
PhD student – Aquatic chemical ecology

Host: Prof. Dr. von Elert

Induction of diel vertical migration in Daphnia:
Insights from mesocosm experiments, thresholds, and kairomone dynamics

Diel vertical migration (DVM) is the largest synchronous movement of biomass on earth, with freshwater microcrustaceans like Daphnia exhibiting this behavior in response to infochemicals (kairomones) released by planktivorous fish. A recently identified DVM-inducing kairomone, 5-alpha-cyprinolsulfate (CPS), highlights the chemical communication underlying predator-prey interactions in aquatic ecosystems. While initial studies using Daphnia magna in controlled indoor bioassays established CPS as a key signal for DVM induction, these experiments did not fully replicate natural lake conditions. To validate the ecological relevance of CPS, we conducted mesocosm experiments with natural zooplankton communities and demonstrated that CPS addition triggered vertical distribution changes characteristic of DVM, particularly in Daphnia longispina. This suggests that CPS-induced DVM is not species-specific. To further elucidate the ecological dynamics of CPS, we measured spatial and temporal variability of CPS in a lake over a season using high-resolution HPLC-MS techniques, and compared these concentrations to DVM induction thresholds. Seasonal CPS variation, while indicative of fish presence or activity, may not directly reflect its turnover. To address this, we quantified CPS exudation by fish and bacterial degradation rates using advanced metabolomics. These findings provide critical insights into the persistence and ecosystem-level implications of CPS, linking kairomone dynamics to predator risk landscapes and advancing our understanding of how chemical signals mediate DVM in lakes.

Gäste sind herzlich willkommen!
Die Mitarbeiter/innen der Ökologie

→ bei Rückfragen: 470-8242 (Niedeggen)