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Mosquito Communities in Rewetted Peatlands: Balancing Ecosystem Restoration and Vector-Borne Disease Risks

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Peatlands are wetland ecosystems that store 44% of terrestrial carbon due to their ability to accumulate organic matter. However, 15% of peatlands worldwide are drained or degraded, threatening the stability of carbon stocks and other ecosystem services that depend on water-saturated conditions. Rewetting peatlands is therefore a key climate mitigation measure. Nevertheless, wet peatlands create ideal breeding habitats for mosquitoes. Although this includes vectors of severe pathogens, our knowledge of the temporal and spatial effects of rewetting measures on the distribution of mosquitoes and mosquito-borne pathogens is limited. To identify different species compositions and unravel driving mechanisms, we set up 15 CO₂-baited traps in a peatland complex in north-eastern Germany, sampling biweekly over 24-hours periods. Sampling sites included rewetted and drained peat soils, drainage pumps and nearby settlements. Rank abundance curves showed similar dominance structures in settlements and rewetted sites, with the most even mosquito communities at pumping stations. Rényi diversity profiles revealed no significant differences in overall diversity, but ordination analysis distinguished two main mosquito communities: one in settlements and one at rewetted sites. Other sites did not host unique assemblages. These results improve our understanding of mosquito ecology in rewetted peatlands and can help mitigate health risks, supporting the acceptance of wetland restoration efforts.

Keywords

peatland, rewetting, Culicidae, arbovirus, zoonoses

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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