



Prof. Dr. habil. Matthias Noll

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Dr. Noll is a microbial ecologist with over 20 years of experiences in the field of molecular characterization of fungal and bacterial microbial communities in anthropogenic as well as pristine habitats. He has contributed for the first microbiome of an aquatic rheophyte *Hansenella heterophylla* growing along different degree of anthropogenic disturbance in Thailand. This work showed relationships between bacteria and fungi within the plant microbiome and their links with plant health and survival. He also contributed for the first holobiont study of mangrove tree *Rhizophora stylosa*. In this study, taxonomic and functions of microbiomes of different plant compartments from rhizosphere, root, stem and leaf were characterized and reported. He and his group found that the holobiont of *R. stylosa* were dominated by fungal richness. Plant compartments was the most important factor impact for both fungal and bacterial richness and community composition of plant microbiome. In Noll's group the functional assignment of leaf- and needle-associated fungal taxa across 12 temperate tree species was evaluated, and as conclusion the annotation tool FungalTraits performed best.

Interaction between wood-inhabiting fungal and bacterial community members were studied in lab based and field-based studies. Deadwood decomposing fungi are highly efficient in the uptake of traces of N, and already trace amounts of N facilitated fungal growth. Bacterial diazotrophs, which are capable to fix atmospheric dinitrogen, were highly important to support fungal deadwood decay. We observed mainly alphaproteobacterial diazotrophs as members of Nitrobacteriaceae, *Methylobacterium* and *Sphingomonas* but also gammaproteobacterial diazotrophs like *Stenotrophomonas* and *Pseudomonas* that co-occur with wood decaying fungi in deadwood. Dr. Noll uses state-of-the-art methodologies and data analyses such as DNA extraction from wood, PCR optimization, DNA fingerprinting techniques, NGS, TGS, identification of sequences, assignments to functional groups, co-occurrence network structure. Dr. Noll has studied mainly temperate regions but collaborated with Dr. Purahong to study plant material from tropical region in Thailand.

Ten most important publications (* corresponding author)

1. Kipping, L., Gossner, M. M., Koschorreck, M., Muszynski, S., Maurer, F., Weiser, W., Jehmlich, N. and **Noll, M. (2022)** Emission of CO₂ and CH₄ from 13 deadwood tree species is linked to tree species identity and management intensity in forest and grassland habitats. *Global Biogeochemical Cycles* 36, e2021GB007143.
2. Purahong, W., Tanunchai, B., Muszynski, S., Maurer, F., Wahdan, S.F.M., Malter, J., Buscot, F., **Noll, M.* (2022)** First insights into the metabolically active deadwood decaying microbiota and their links with ecosystem functions and processes. *Proceedings of the Royal Society Biological Sciences* 20220130.
3. Tanunchai, B., Ji, L., Wahdan, S. F. M., Hossen, S., Delelegn, Y., Buscot, F., Schulze, E.-D., **Noll, M.*** and Purahong, W. (2022) FungalTraits vs. FUNGuilds: comparison of ecological functional assignments of leaf litter associated fungi across 12 temperate tree species. *Microbial Ecology*. <https://doi.org/10.1007/s00248-022-01973-2>
4. Tanunchai, B., Kalkhof, S., Guliyev, V., Wahdan, S.F.M., Krstic, D., Schyma, V., Schädler, M., Knorr, S., Geissler, A., Buscot, F., Blagodatskaya, E., **Noll, M.*** and Purahong, W. (2022) Nitrogen fixing bacteria facilitate microbial biodegradation of a bio-based and biodegradable plastic in field soils under ambient and future climates. *Environmental Science: Processes & Impacts Royal Society of Chemistry*. DOI: 10.1039/d1em00426c
5. Muszynski, S., Maurer, F., Henjes, S., Horn, M. A. and **Noll, M.* (2021)** Fungal and bacterial diversity patterns of two diversity levels retrieved from a late decaying *Fagus sylvatica* under two temperature regimes. *Frontiers in Microbiology* Vol. 11, Article 548793.
6. Wahdan, S. F. M., Heintz-Buschart, A., Sansupa, C., Tanunchai, B., Wu, Y., Schädler, M., **Noll, M.**, Purahong, W., Buscot, F. (2021) Targeting the active rhizosphere microbiome of *Trifolium pratense* in grassland evidences a stronger-than-expected belowground biodiversity-ecosystem functioning link. *Frontiers in Microbiology* Vol. 12, Article 629169.
7. **Noll, M.***, Büttner, C. and Lasota, S. (2019) Copper containing wood preservatives shifted bacterial and fungal community compositions in pine sapwood in two field sites. *International Biodeterioration and Biodegradation* 142:26-35.
8. Lasota, S., Stephan, I., Horn, M. A., Otto, W. and **Noll, M.* (2019)** Copper in wood preservatives delayed wood decomposition and shifted soil fungal but not bacterial community composition. *Applied and Environmental Microbiology* 85: e02391-18.
9. Weißhaupt P., Pritzkow W., and **Noll M.* (2011)** Nitrogen metabolism of wood decomposing basidiomycetes and their interaction with diazotrophs as revealed by EA-IRMS. *International Journal of Mass Spectrometry* 307:225-231.
10. **Noll M.**, Matthies D, Frenzel P, Derakshani M, and Liesack W (2005) Succession of bacterial community structure and diversity in a paddy soil oxygen gradient. *Environmental Microbiology* 7:382-395.