Secondary metabolites from insect-associated microbes

The major goal of this multidisciplinary research proposal is to isolate, characterize and understand the role of natural products produced by microorganisms from fungus-growing termites. Similar to the fungus-growing ant system, farming in fungus-growing termites is accomplished through an intricate mode of substrate incorporation and fungus cultivation.

Fungal garden

Together with the group of M. Poulsen we are using different research strategies to approach this project. We will use various different culturing techniques to isolate and study microbes of interest. We are also interest in the cultivation of microbial communities to harvest the (bio)-chemical of potential non-culturable microbes. Studying the microbiome of social insects will help identifying both new aspects of
small-molecule mediated interkingdom communication and symbiotic relationships, as well as new antibacterial and antifungal agents.

Isolated Actinobacteria

colonies of an actinomycete

Streptomyces sp.

Amycolatopsis sp.

Video clip about our research project

Termine Fungiculture – A Hidden Treasure Trove

Pharmaceutical Potential
The isolated and characterised secondary metabolites will be tested in terms of their pharmaceutical potential. Under consideration of the ecological context, these natural products represent a promising source of new chemical structures with potential selective pharmacologic properties, which could be applied in current infection research fields.

These projects are realised by a strong collaboration of Poulsen group (University of Copenhagen, Denmark), the Biotechnikum (HKI) and the Jena Microbial Resource Collection (HKI).

Our Collaborations

Our collaboration partners:

- **Group of Prof. M. Poulsen** (University of Copenhagen, Denmark),
- **Group of Prof. K.-H. Kim** (Sungkyunkwan University, Republic of Korea)
- **Bio Plant Facility** (HKI)
- **Jena Microbial Resource Collection** (HKI)

Open research topics

We have currently open topics for research projects (> 3 weeks) and master thesis.

For further details, please contact [Christine Beemelmanns](mailto:christine.beemelmanns@uni-halle.de).

Publications


Lee SR, Beemelmanns C, Tsumac LMM, Clardy J, Cao S, Kim KH (2016) A New Diketopiperazine, Cyclo(D-trans-Hyp-L-Leu) from a Kenyan Bacterium Bacillus licheniformis LB 8CT *Natural Product Communications* 4(11), 461-463. [Details](#)


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