TECHNISCHE UNIVERSITÄT DRESDEN

DRESDEN concept

Chair of Bioprocess Engineering

Environmental friendly pigments from Fungi

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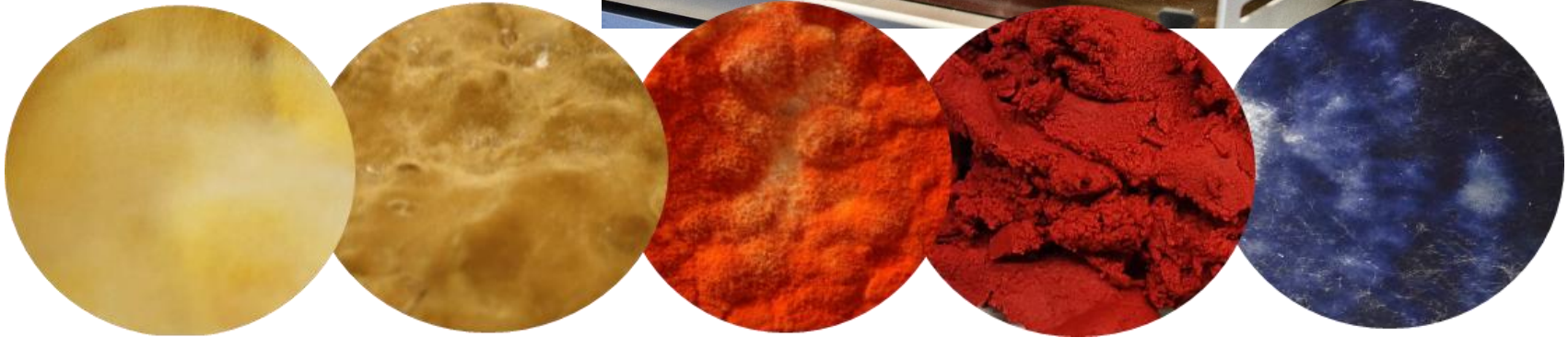
Natural pigments



Natural pigments

Motivation

Circular bioeconomy

- Valuable products from agricultural waste streams by lignocellulose degrading fungi
- Natural alternatives for synthetic (sometimes harmfull) colorants
- Environmental friendly production of dyed materials

Applied techniques

Fermentation

- Submerse fermentation (shake flasks, 7 L – 70 L bioreactor) → media optimization
- Emerse fermentation (agar plate to rotating drum reactor, various solid substrates)
- Process analytics (online: pH, DO, T; offline: biomass, sugar composition/concentration, TN, TOC, pigment extraction, UV-Vis)

Enzymatic assays (cellulase, xylanase, laccase)

Microscopy

Pigment application

Natural pigments

Previous research focus

- Laetiporic acids from *Laetiporus sulphureus* (Zschätzsch et al., 2021)
- Hispidin from *Inonotus hispidus* (Bergmann et al., 2022)
- Xylindein from *Chlorociboria aeruginascens* (Zschätzsch et al., 2021)
- Polyporic acid from *Hapalopilus rutilans*

70 L bioreactor at harvest (laetiporic acid)

7 L bioreactor at harvest (xylindein)

ongoing research project – cooperation with ITM + HFT (TU Dresden)

- POET - Xylindein from *Chlorociboria aeruginascens*

HFT Professur für Holztechnik und Faserwerkstofftechnik

ITM LEADING IN FIBRE & TEXTILE TECHNOLOGY Forschungsinstitut der Exzellenzuniversität

Zschätzsch, M., Steudler, S., Reinhardt, O., Bergmann, P., Ersoy, F., Stange, S., Wagenfuhr, A., Walther, T., Berger, R.G., Werner, A. (2021) Production of natural colorants by liquid fermentation with Chlorociboria aeruginascens and Laetiporus sulphureus and prospective applications. Eng Life Sci 21: 270-282
Bergmann, P., Frank, C., Reinhardt, O., Takenberg, M., Werner, A., Berger, R.G., Ersoy, F., Zschätzsch, M. (2022) Pilot-scale Production of the Natural Colorant Laetiporic Acid, its Stability and Potential Applications. Fermentation 2022, 8, 684