

Natural anthraquinone red dyes and their ecotoxicological impacts on different aquatic organisms

Natália O. de Farias¹, Amanda dos Santos¹, Gabriela Almeida¹, Riikka Räisänen² and Gisela A. Umbuzeiro¹

¹School of Technology, University of Campinas, Limeira, SP, Brazil; ²Department of Education/Craft Studies, University of Helsinki, Helsinki, Finland.

Emerging pollutants in aquatic ecosystems

Introduction & Aim

- In the textile industry, great quantities of water containing **dyes** are released into the aquatic ecosystem and can pose risks to humans and biota. Research on natural resources has increased and **biocolourants** have been investigated as an alternative source of colour for textiles to synthetic dyes.
- In this work, we used two highly purified anthraquinone dyes (>98%), selected by BioColour project, dermorubin and dermocycin extracted from the fungus *Cortinarius sanguineus* and evaluated their aquatic toxicity.

Material and Methods

- Acute toxicity** was evaluated with freshwater microcrustacean *Daphnia similis*, the marine crustacean, *Parhyale hawaiiensis* and the freshwater fish *Danio rerio* in an embryotoxicity (FET) test.
- Chronic toxicity** tests were evaluated with the green microalgae *Raphidocelis subcapitata* and the freshwater crustacean *Ceriodaphnia dubia*.

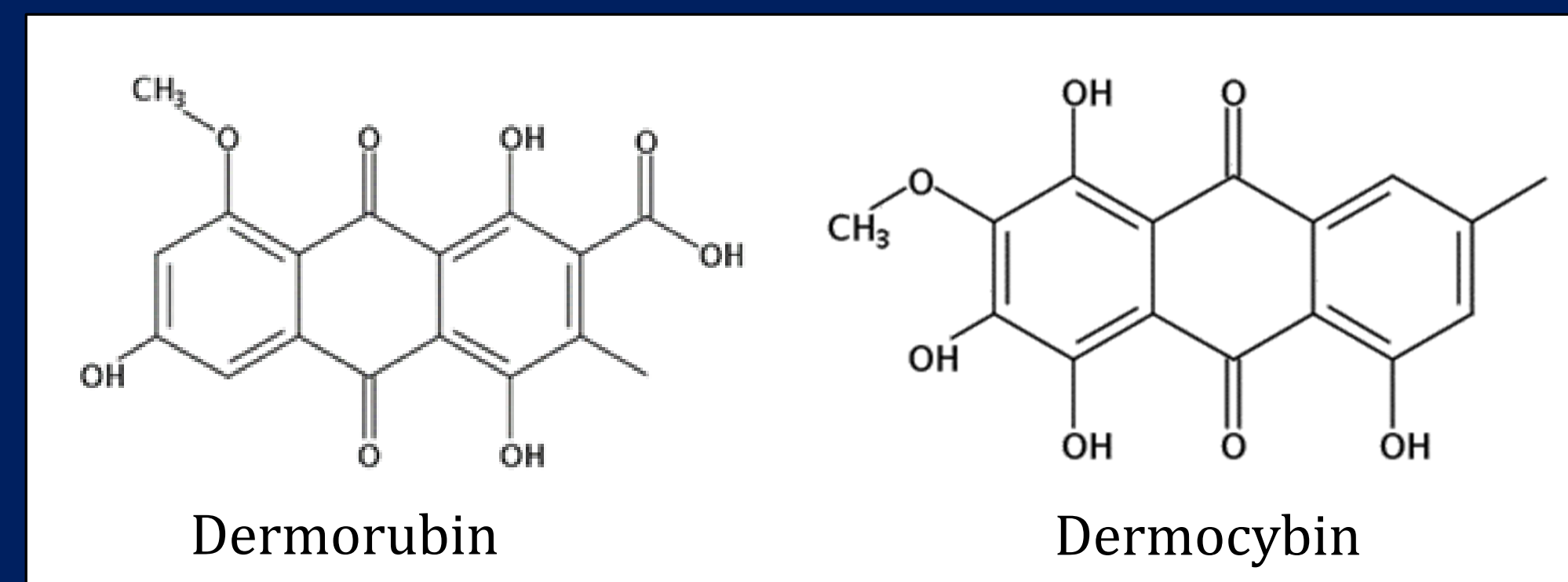
Results

- ✓ Mutagenicity assay (Ames test) were previously performed and provided negative results for both dyes;
- ✓ Dermorubin was not toxic to any of the organisms;
- ! Dermocycin was toxic to *D. similis*, *C. dubia* and zebrafish embryos.

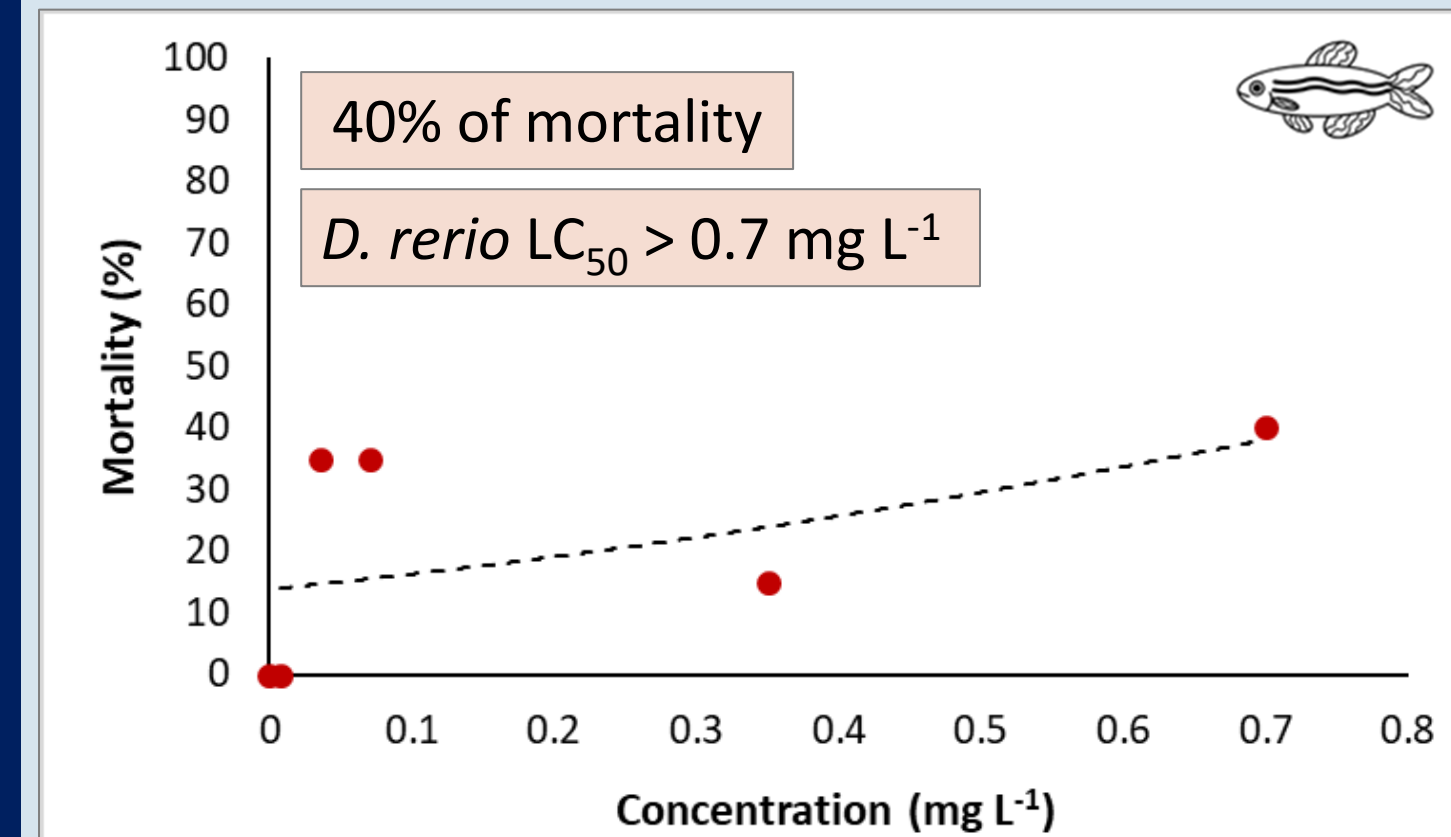
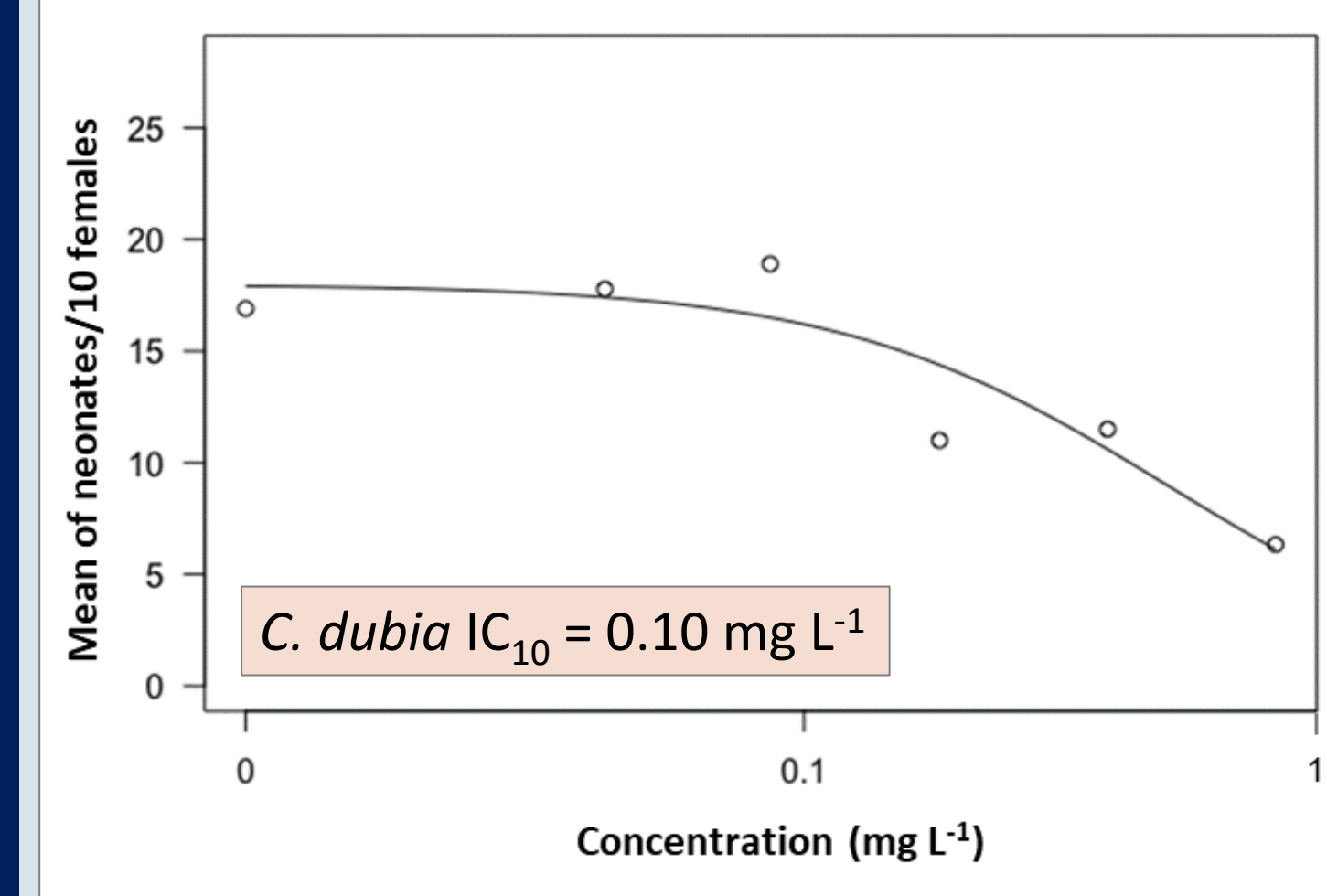
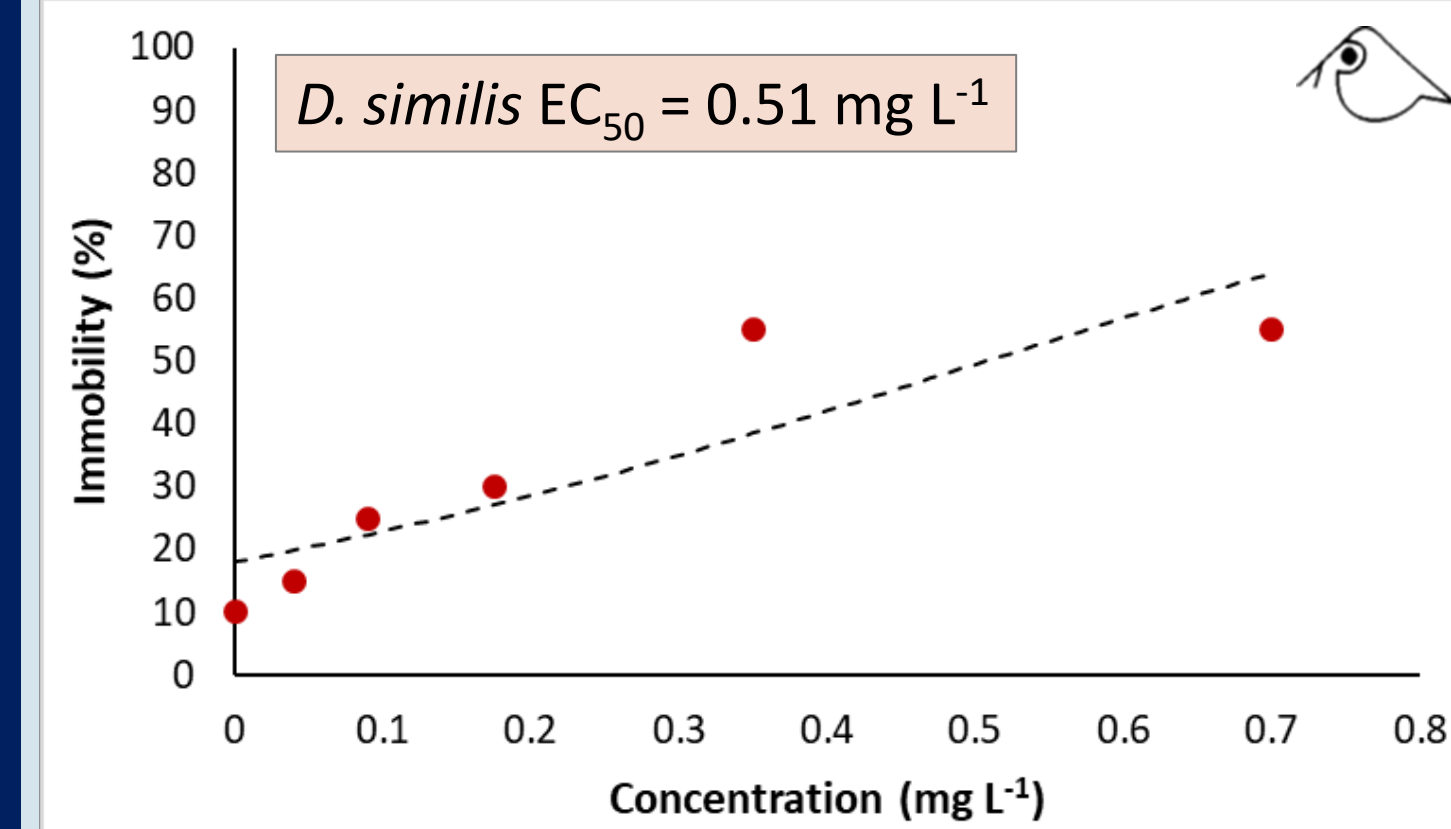


e-mail: nath.unb94@gmail.com

Two chemically similar, non-mutagenic natural **red dyes** with different ecotoxicological responses. Dermocycin was toxic to aquatic organisms, while dermorubin was not toxic to any of the organisms tested.



Ecotoxicity results of dermocycin



Next step

Comet assay of both dyes with zebrafish larvae and hemolymph of *P. hawaiiensis*.

Acknowledgements

