GLYBIOSYNTH

GLYcerol BIOSYNTHon for a sustainable agriculture

(CP2D 2007)

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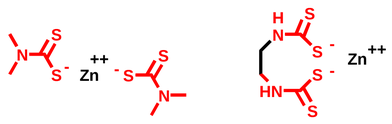
Cost-efficient and environmentally friendly route to safer fungicides having glycerol moiety

Commercially available dithiocarbamate fungicides

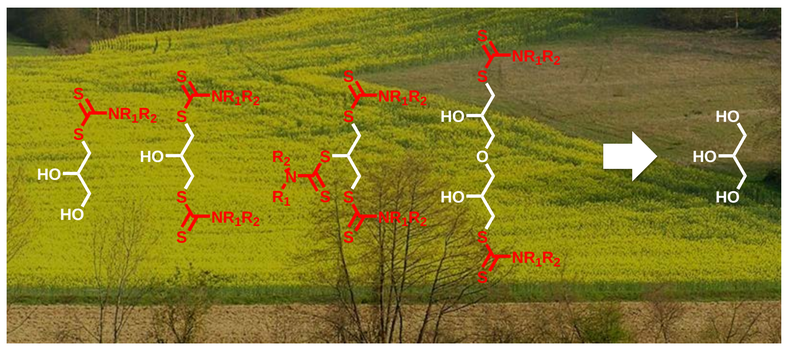


Zirame® Zineb®

DISADVANTAGES

presence of metals; stability; non-degradability; obstinacy of these metals causing with difficulty controllable environmental disorders; process of metabolisation giving the formation of ethylenethiourea, responsible for the cancer of the thyroid.

Concept developed in this project



ADVANTAGES

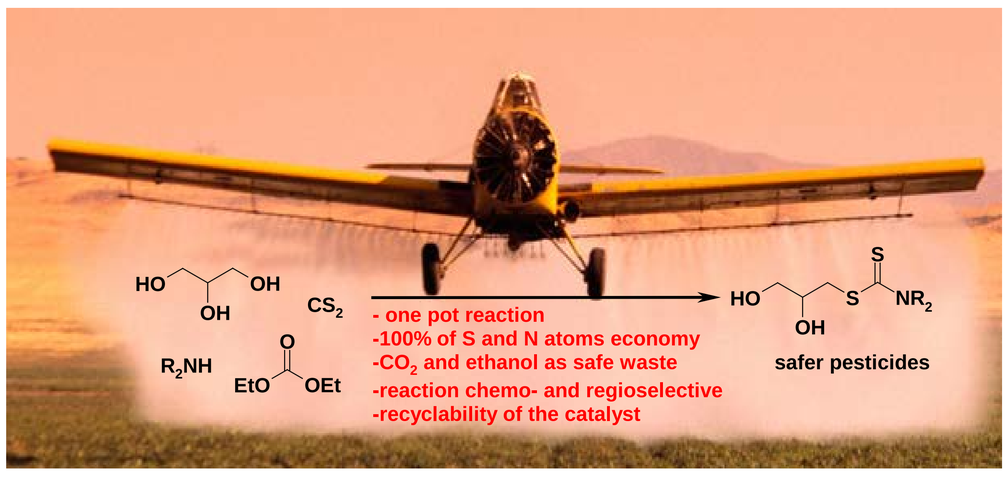
absence of heavy metals will not cause the environmental disorders connected to marketed molecules

replacement of the ethylenediamine by a natural substance: the glycerin will not lead to the formation of ethylenethiourea responsible for cancers of the thyroid

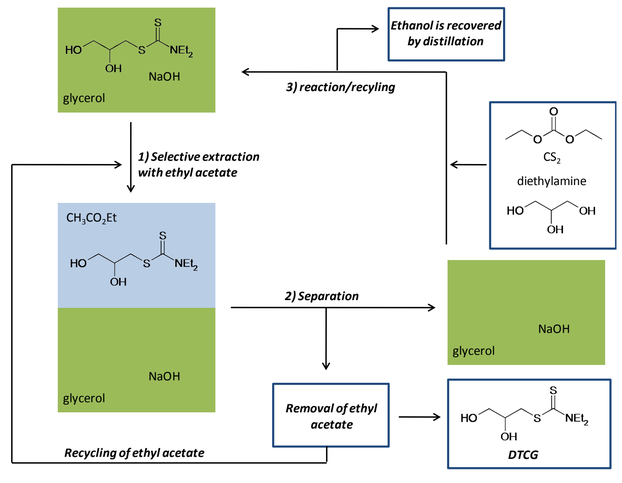
use of the glycerin can lead to biocompatible, biodegradable metabolites and potentially non-toxic compounds

Regioselective functionalization of glycerol with a dithiocarbamate moiety

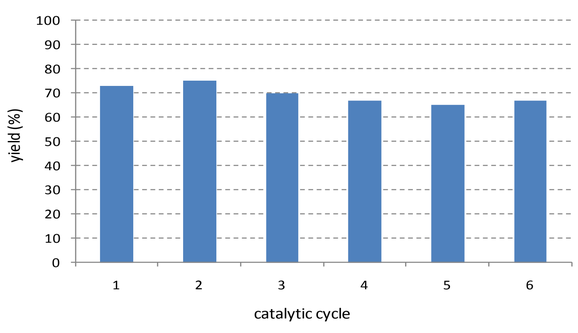
One-pot synthesis of dithiocarbamic ester of glycerol



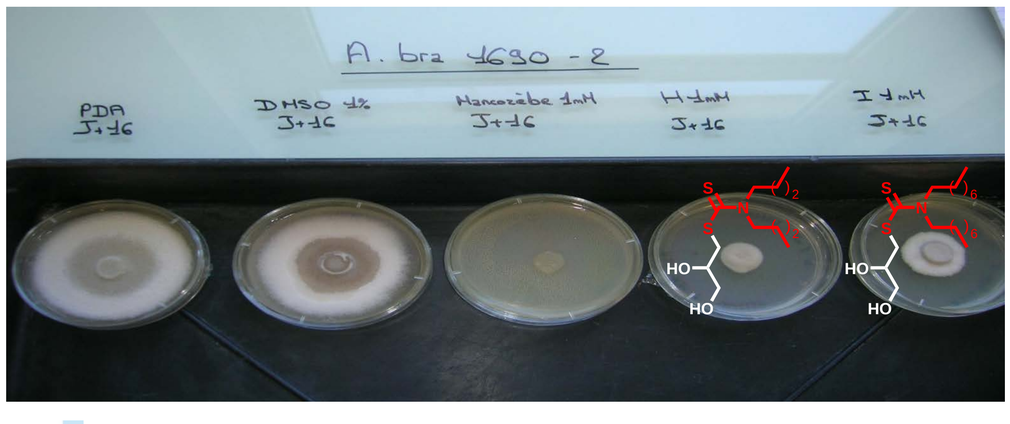
Sustainable process



Reycling experiments

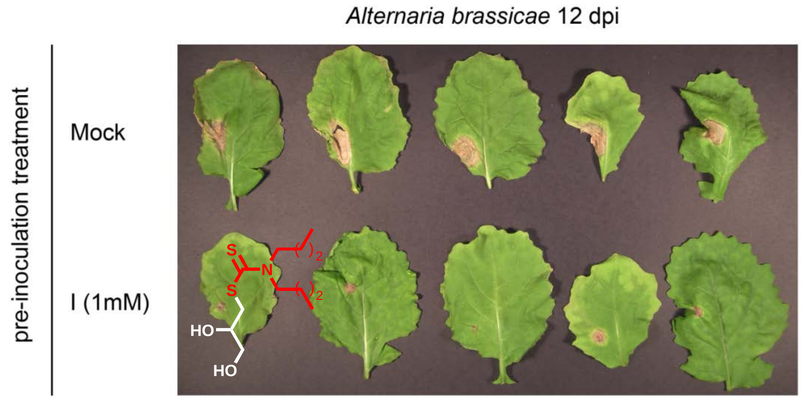


In vitro antifungal activity



In vivo antifungal activity

Properties of the plant/pathogen system



Conclusion

Scale-up of the process (5x200 g, 1 kg)
Strengthening of the collaboration between all the partners as exemplified by the provision of a staff of Jouffray-Drillaud in the team managed by Dr Rémi Lemoine

Production

Patent Fr0906203, 2010
Green Chemistry, **2011**, *13*, 1129-1132
PhD thesis of R. De Sousa, Université de Poitiers, 20/12/2010
PhD thesis of D. Mathiron, Université de Picardie Jules Verne, 12/2012

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