Adaptative Evolution of Metallothionein 3 in the Cd/Zn Hyperaccumulator

*Thlaspi caerulescens*

Nancy H. Roosens\textsuperscript{a, *}, Catherine Bernard\textsuperscript{a}, Raphael Leplae\textsuperscript{b}, and Nathalie Verbruggen\textsuperscript{a}

\textsuperscript{a} Laboratoire de Physiologie et Génétique Moléculaire des Plantes, Université Libre de Bruxelles, Campus Plaine (CP 242) Bd du triomphe, B-1050 Brussels, Belgium. Fax: (32)(0)26505421. E-mail: nroosens@ulb.ac.be

\textsuperscript{b} Service de Conformation des Macromolécules Biologiques et Bioinformatique, Université Libre de Bruxelles, Campus Plaine (CP 263) Bd du triomphe, B-1050 Brussels, Belgium

\* Author for correspondence and reprint requests

\textit{Z. Naturforsch.} 60c, 224–228 (2005)

A functional screening in yeast allowed to identify various cDNAs from the Cd/Zn hyperaccumulator *Thlaspi caerulescens*. \textit{TcMT3} displayed high identity with its closest homologue in \textit{Arabidopsis thaliana} but variation in its Cys residues. Functional analysis in yeast supported a higher binding capacity for Cu, but not for Cd or Zn, of \textit{TcMT3} compared to \textit{AtMT3}. Expression analysis in plants indicated that metallothionein 3 (\textit{MT3}) like all the other \textit{T. caerulescens} genes from the screen studied is overexpressed in all studied populations of \textit{T. caerulescens} compared to \textit{A. thaliana}. \textit{TcMT3} was induced by Cu, but not by Cd. Moreover significant variation in expression within \textit{T. caerulescens} populations that have contrasting tolerance and accumulation capacities indicated a possible local adaptation of \textit{MT3}.

\textbf{Key words:} Metallothionein, Metal Homeostasis, Metal Hyperaccumulation