Transcripts of Gracilaria changii that improve copper tolerance of Escherichia coli

ABSTRACT

In this study, we used bacterial functional screening to isolate transcripts from a red seaweed, Gracilaria changii Abbott, Zhang et Xia (Xia et Abbott) that improved copper tolerance of Escherichia coli. We have identified several seaweed proteins that may be involved in copper efflux, detoxification and ROS scavenging, such as ATPase, outward-rectifying potassium channel (KCO1), vanadium chloroperoxidase and a high affinity phosphate transporter. All transcripts were shown to be able to enhance the copper tolerance of E. coli up to 4 mM CuCl2. These transcripts may share similar functions in the copper homeostasis of both E. coli and G. changii. In addition, we discovered a few transcripts with uncharacterized function(s) in copper tolerance in both organisms.

Keyword: Copper tolerance; Escherichia coli; Gracilaria changii; Seaweed