Molecular Characterization of the Copper Resistance Operon copAB in *Xanthomonas citri* subsp. *citri*

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*Xanthomonas citri* subsp. *citri* (*Xcc*) is a phytopathogenic bacterium that causes citrus canker. After sequencing its genome, genes encoding proteins related to copper resistance were identified (*copA* and *copB*). Copper compounds have been used to control plant bacterial disease and the effectiveness of the process has been reduced by the appearance of copper resistant strains. The genes *copA* and *copB* are organized in an operon whose transcription is induced and specific to copper. The ORF XAC3629 encoding a 152 amino acids hypothetical protein was identified upstream the operon *copAB*. Previous results demonstrated that the inactivation of the ORF sequence led to a complete loss of the copper resistance. The mutant strain were unable to grow in culture medium containing copper. In this work, we demonstrated by Northern blot assays that the operon and the ORF XAC3629 were not expressed in the mutant strains, suggesting that XAC3629 may have a role in the *copAB* expression regulation in the presence of copper. To better understand the molecular mechanisms, DNA fragments from the 5'-flanking region of the operon *copAB* containing the ORF XAC3629 were amplified by PCR and analyzed by DNA shift assay using *Xcc* protein prepared from cells grown in the presence of copper. Crude *Xcc* protein extract was fractionated by Heparin-Sepharose chromatography and protein fractions able to bind to the fragments were identified. Different DNA-protein complexes were observed in the DNA fragments analyzed and the specificities were confirmed by using the same DNA fragments as specific competitor. The results suggest that different proteins might be involved in the regulation of the operon *copAB* in addition the XAC3629.

Word Keys: *Xanthomonas citri*, copper, operon *copAB*

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