Supplementary Information

Copper and Manganese Cations Alter Secondary Metabolism in the Fungus *Penicillium brasilianum*

Taícia P. Fill,*[a] Heloisa F. Pallini,[b] Luciana S. Amaral,[b] José Vinicius da Silva,[b] Danielle L. Bidóia,[c] Francieli Peron,[c] Francielle P. Garcia,[c] Celso V. Nakamura[c] and Edson Rodrigues-Filho[b]

[a]Instituto de Química, Universidade Estadual de Campinas, CP 6154, 13083-970 Campinas- SP, Brasil

[b]Departamento de Química, Universidade Federal de São Carlos, CP 676, 13565-905 São Carlos-SP, Brazil

[c]Laboratório de Inovação Tecnológica no Desenvolvimento de Fármacos e Cosméticos, Universidade Estadual de Maringá, Av. Colombo 5790, Bloco B-08, 87020-900 Maringá-PR, Brazil

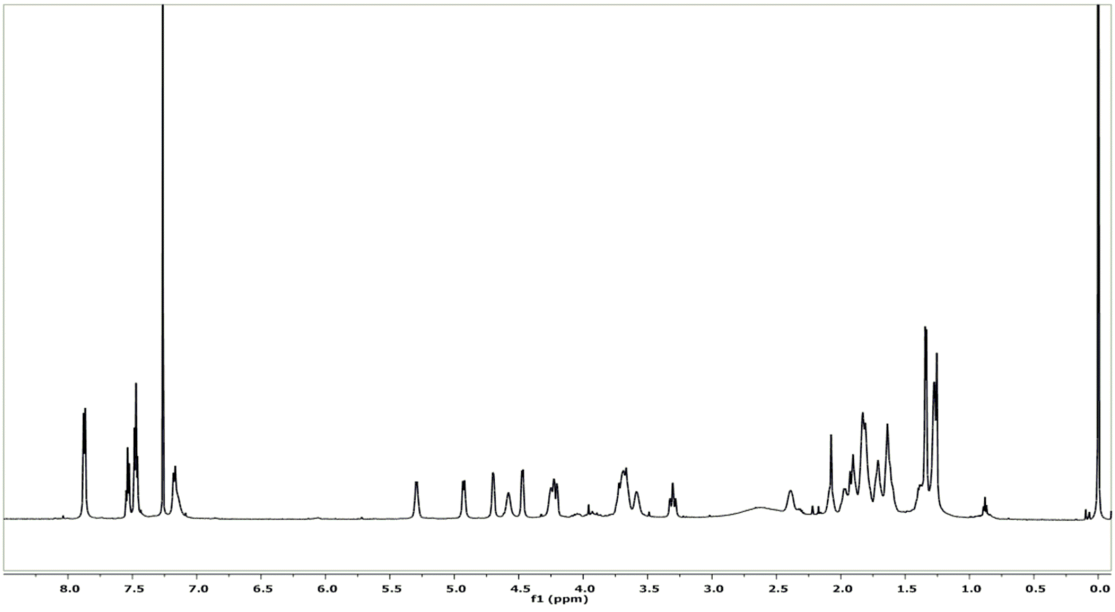

Figure S1. ^{1}H NMR spectrum of compound **1** (600 MHz, $CDCl_3$).

*e-mail: taicia@iqm.unicamp.br

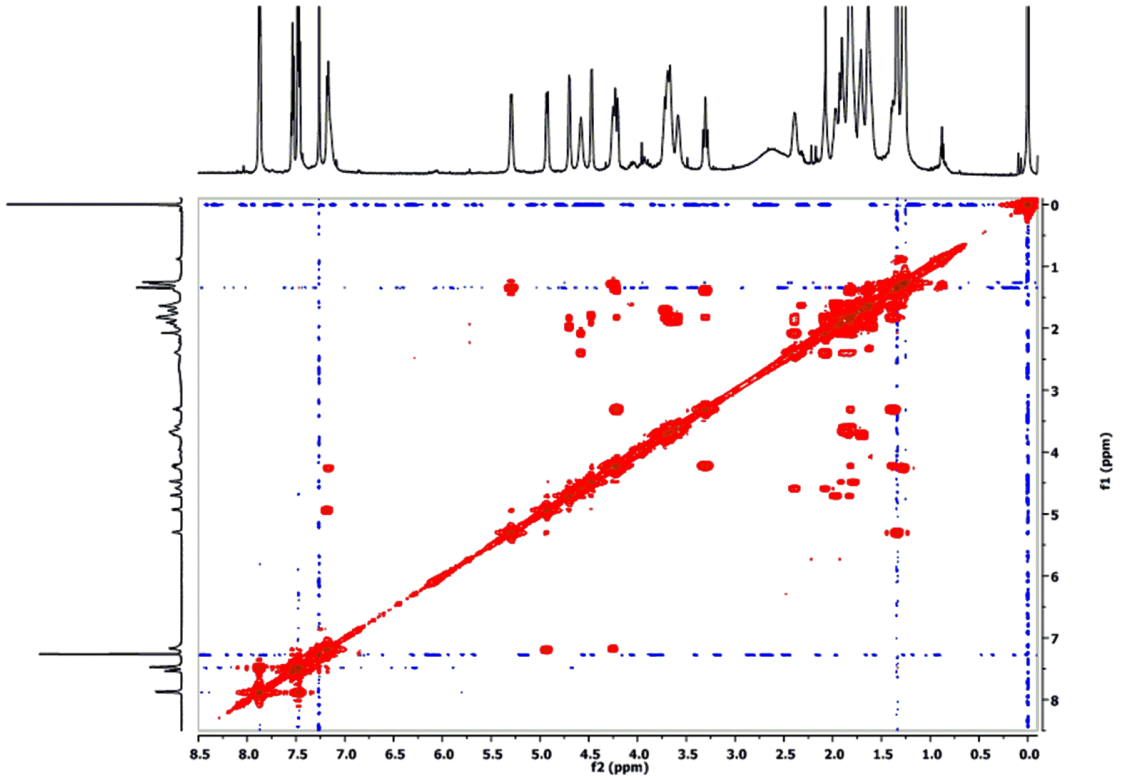

Figure S2. COSY spectrum of compound **1** (600 MHz, $CDCl_3$).

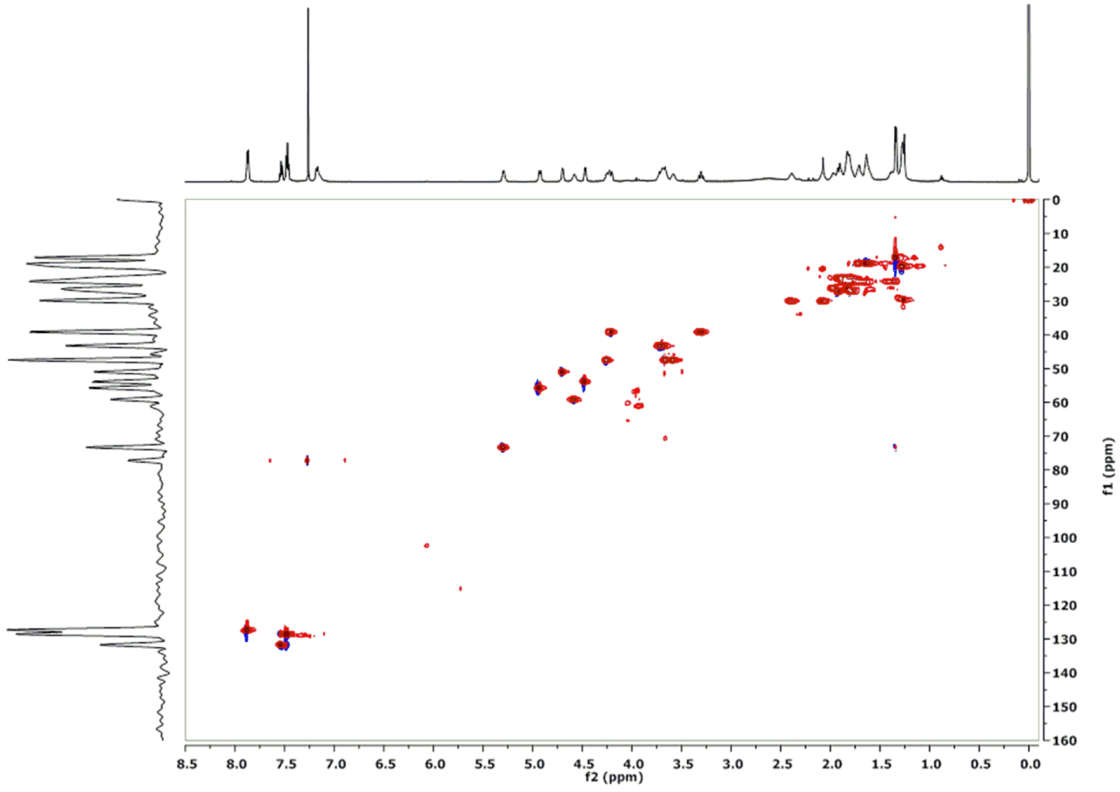

Figure S3. HSQC spectrum of compound **1** (600 MHz, $CDCl_3$).

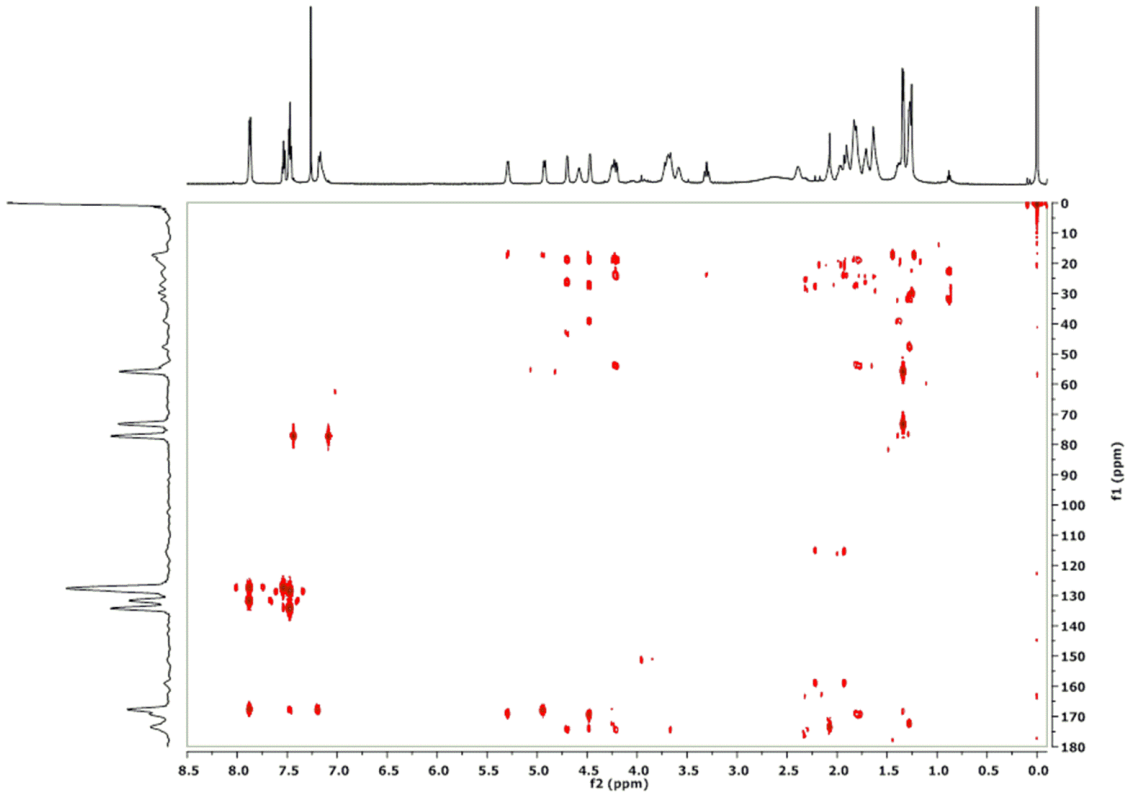

Figure S4. HMBC spectrum of compound **1** (600 MHz, $CDCl_3$).

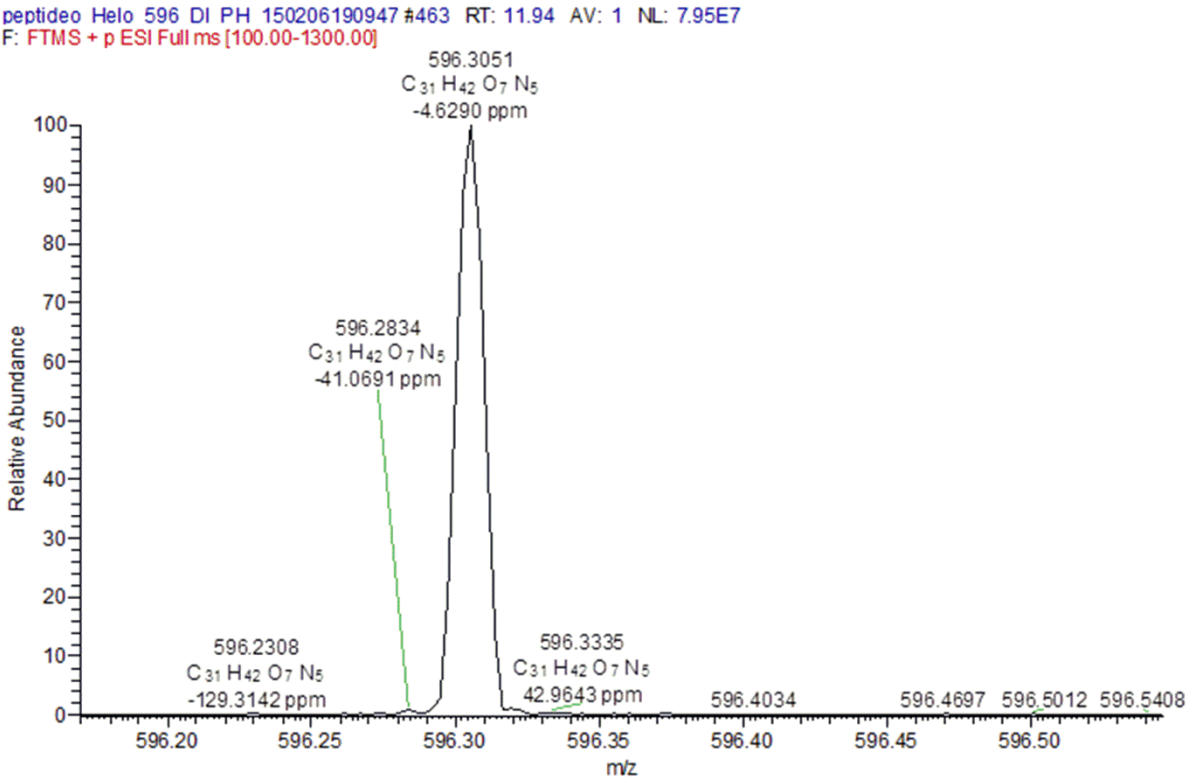

Figure S5. HR-ESIMS(+) spectrum of compound **1**.

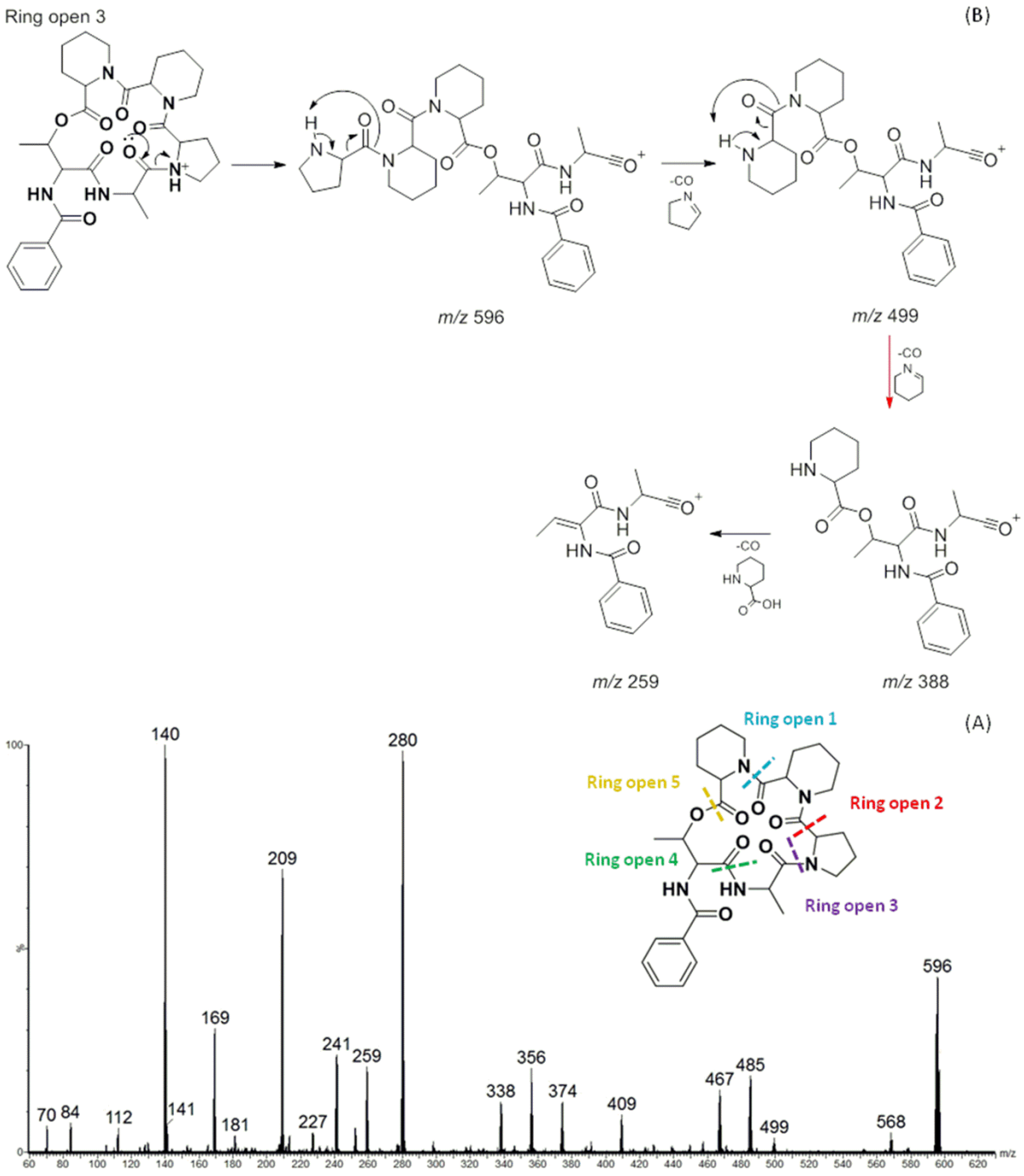

Figure S6. (A) Product ion of $[M + H]^+$ at *m/z* 596 and possibilities of ring opening; (B) fragmentation proposal for compound **1** open ring 3.

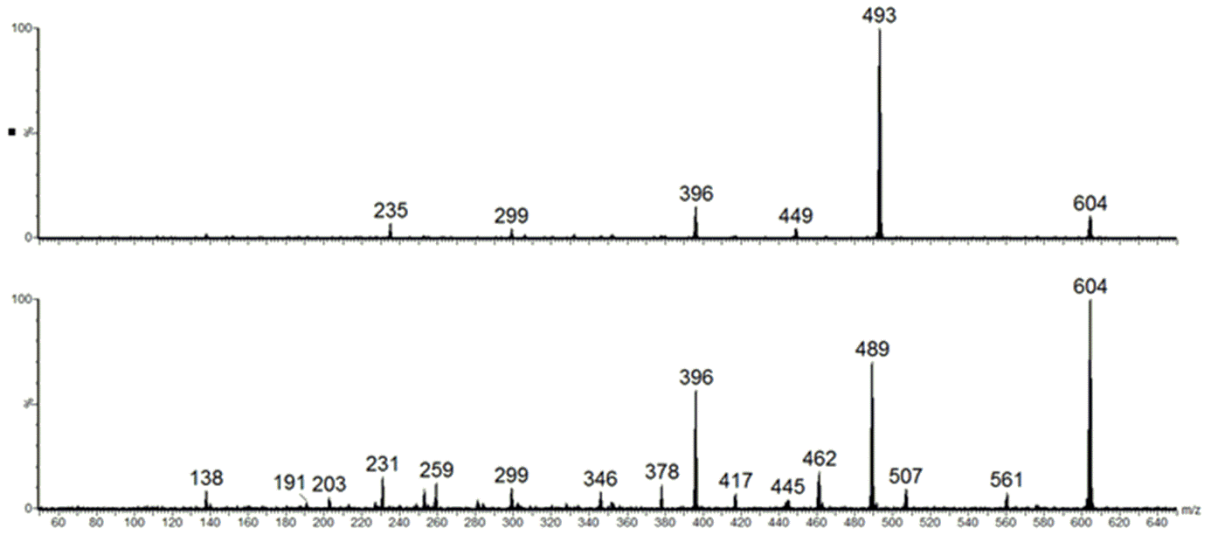

Figure S7. MS/MS data for compound JBIR 114 and 115, respectively.