Tests of Antimicrobial Activity of 6-Pentyl α-Pyrone on Fungus Rhizopus Stolonifer in Papayas

Paulo T. Saito¹, Cyntia A. Tanaka¹, Cláudio T. Ueno¹, Raúl J.H. Castro-Gómez²
¹ Universidade Tecnológica Federal do Paraná - UTFPR, Avenida dos Pioneiros 3131, 86036-370 Londrina - PR, Brasil.
² DCTA – Depto de Ciência e Tecnologia de alimentos - Universidade Estadual de Londrina – UEL, Rod. Celso Garcia Cid, Km 380 86051-980, Londrina – PR, Brasil.

Agriculture has an important role in Brazilian economy, so the country should attempt to post-harvest losses. One problem is the damage caused by pathogens during transport, storage and trading. The natural antimicrobials such as 6-pentyl-α-pyrone (6PP) produced by Trichoderma atroviride, may be a feasible alternative for reducing losses due to its low toxicity. The aim of this work was to evaluate antimicrobial activity of concentrated 6PP (6PPc) with or without preservatives in papaya fruits to inhibit the fungus Rhizopus stolonifer. The 6PPc was extracted from the culture of T. atroviride with molasses and yeast extract. Concentration of 6PPc was determined by UV-VIS spectroscopy at 302nm. The inhibitory activity “in vitro” of 6PPc, 6PPc+BHT, 6PPc+EDTA to R. stolonifer was efficient, with minimal inhibitory concentration (MIC) of 100µg of 6PPc/mL BDA, same concentration used in papayas. The fruits were treated differently in five groups: negative control (C-), ethanol, 6PPc, 6PPc+BHT and 6PPc+EDTA. After 48 hours the mature papayas, (C- and ethanol) showed senescence patches, shriveling, and the treated with 6PPc at 72h. The pronounced rottenness appeared after 96h on fruits treated with 6PPc+BHT and 6PPc+EDTA, not in fruits treated only with 6PPc. The green fruit showed fungal growth on C-, ethanol, 6PPc+BHT at 148h. The fruits treated with 6PPc+EDTA and 6PPc showed fungal growth at 192h and 216h respectively. Probably, the presence of antioxidants has affected the direct interaction with the 6PPc fungi pathogens justifying the greater efficiency of 6PPc that demonstrated a good potential against phytopathogenic fungi.