

Title *Citrus paradisi* and *Citrus sinensis* flavonoids: Their influence in the defence mechanism against *Penicillium digitatum*

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Citation Food Chemistry Volume 98, Issue 2, 2006, Pages 351-358

Keyword Citrus; Orange; Grapefruit; Flavanones; Polymethoxyflavones; *Penicillium digitatum*

Abstract

Citrus peel is rich in flavanone glycosides and polymethoxyflavones. In view of their importance for industrial application as well as for their pharmacological properties, their content was analyzed in the mature fruits of several *Citrus paradisi* (grapefruit) and *Citrus sinensis* (orange) varieties, with a view to select the most interesting for isolation. The results shows that the Star Ruby grapefruit and the Sanguinelli orange stand out for their high contents of naringin and hesperidin, respectively. The presence of the polymethoxyflavones nobiletin, heptamethoxyflavone and tangeretin, could be ascertained in all the grapefruit varieties analysed. Higher polymethoxyflavone levels were recorded in orange, with Valencia Late showing the greatest nobiletin, sinensetin and tangeretin contents and Navelate the highest heptamethoxyflavone levels. An in vitro study revealed that these compounds acted as antifungal agents against *Penicillium digitatum*, the polymethoxyflavones being more active than the flavanones in this respect. The possible participation of these phenolic compounds in the defence mechanism of *Citrus* against *P. digitatum* is discussed.