

A201 3-Hydroxy-4-phenyl-2-butanone in Greek bee-honeys and its antimicrobial activity

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As a part of a systematic research on the chemical composition and on biological activities of the famous, through Antiquity, Greek bee-honeys, and as it has been observed an increasing interest in its use in traditional Mediterranean food; we report in this study the detection and isolation of 3-hydroxy-4-phenyl-2-butanone in five, among forty, Greek honeys. The above referred hydroxyketone has never been detected before, in any kind of bee-honeys, and it has been found as a natural product only in wine (1) and among the flower volatiles of *Wisteria floribunda* (Fuji) and *Mimusops elengi* (2), both plants growing in Japan and Malaysia, respectively.

Forty Greek mono- and unifloral bee-honeys samples produced in thirty different regions of Greece, were studied for their volatile secondary metabolites. In five, among the examined samples, 3-hydroxy-4-phenyl-2-butanone was detected in concentrations ranging from 12.98 to 68.29%. The compound was isolated and identified by spectral means (1D, 2D NMR). The antimicrobial activities of samples containing the ketone and of pure isolated compound were determined, using the dilution technique, by measuring the MIC of them, against two Gram-positive bacteria: *S. aureus* and *S. epidermidis*, four Gram-negative bacteria: *E. coli*, *E. cloacae*, *K. pneumoniae* and *P. aeruginosa* and three pathogenic fungi *Candida albicans*, *C. tropicalis* and *C. glabrata*, all of them strains of ATCC. Through the antimicrobial screening, the bee-honeys as well the characteristic hydroxyketone, proved to be significantly active against all nine tested microorganisms (MIC values 0.15-3.2 mg/mL). The results of our studies suggest that the activity of the studied bee-honeys can be attributed, at least in part, to the existence of the isolated hydroxyketone.

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References: 1. Sakato K.H. et al. (1975) *Am. J. Enol. Vitic.* 26:70-74. 2. Wong K.C., Teng Y.E. (1994) *J. Essent. Oil Res.* 6:453-458.

A202 In vitro susceptibility of *Chlamydia pneumoniae* to red wine extracts and resveratrol

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Coronary heart disease (CHD) remains the number one cause of death globally, with approximately 12 million people dying annually due to its consequences. Recent research indicates that atherosclerosis has an infectious component, and seroepidemiological data indicate that there is a strong association between chronic *Chlamydia pneumoniae* (CP) infections and CHD. CP is an intracellular gram-negative pathogen and is known as a leading cause of human acute respiratory tract infections worldwide. The infection generally starts in the respiratory tract and probably disseminates systemically in the blood stream within alveolar macrophages. Our previous investigations have demonstrated that red wine and resveratrol (3,4',5-trihydroxystilbene), a phytoalexin found in grape skin, inhibit the growth of another gram-negative bacterium, *Helicobacter pylori* *in vitro*. In this report, the activity of various red wine extracts and resveratrol were assessed on the proliferation of *Chlamydia pneumoniae* in Hep 2 cells *in vitro*. Both the methanol soluble and methanol-insoluble extract of red wine inhibited the growth of *C. pneumoniae*, with a minimum inhibitory concentration range of 100-500 µg/ml. Resveratrol also inhibited the growth of two *C. pneumoniae* strains with an MIC range of 6.25 to 50 µg/ml, thereby demonstrating significant activity. This work suggests that in addition to other biological mechanisms, red wine and resveratrol may reduce cardiovascular risk by inhibiting the growth of *C. pneumoniae*.

References: 1. Mahady GB et al. (2000) *Amer. J. Gastroenterol.* 95:1849.