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LETTERS TO THE EDITOR

MICROBIOLOGICAL SYNTHESIS OF 4-HYDROXY-5-ISOPROPYL-5-METHOXY-2-OXO-2,5-DIHYDROFURAN

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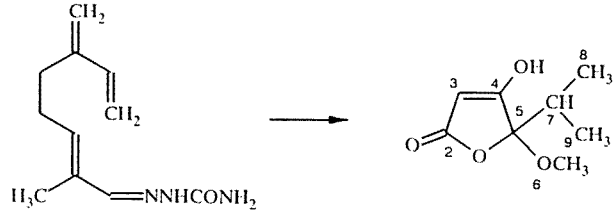
In studies of microbiological transformations of myrcene derivatives by different strains of fungi from the *Beauveria, Aspergillus, Cunninghamella* and *Penicillium* genera which are able to hydroxylate nitrogen-containing compounds stereoselectively [1-4], we have observed that only a suspension of nonmultiplying *Penicillium simplicissimum* under standard conditions [2] selectively converted myrcenal semicarbazone (I) (at a concentration of 300 mg/liter) into 4-hydroxy-5-isopropyl-5-methoxy-2-oxo-2,5-dihydrofuran (II) which we extracted from the incubation medium with ethyl acetate.



I II

Yield 84%, mp 83-85°C, analytically pure sample (recrystallised three times from hexane–ethyl acetate), R_f 0.61 (40/100 Chemapol silica gel, 10:10:2 hexane–ethyl acetate–methanol). UV spectrum: λ_{max} 235 nm (lg ε 1.13). IR spectrum: 3600 (OH), 1720 (C=O), 1650 cm^{-1} (C=C). ^1H NMR Spectrum: 0.88 (3H, d. 8-CH_3), 1.07 (3H, d, 9-CH_3), 2.20 (1H, m, 7-CH), 3.90 (3H, s, 6-CH_3), 4.15 (1H, s, OH), 5.05 ppm (1H, s, 3-CH). ^{13}C NMR spectrum : 15.2 (q, C(8)), 16.4 (q, C(9)), 33,2 (d, C(7)), 59.6 (q, C(6)), 89.4 (d, C(3)), 105.4 (s, C(4)), 170.9 (d, C(2)), 179.8 ppm (s, C(5)). Mass spectrum (*m/z*, relative intensity, %): 172 (4, M); 157 (10, M − CH_3), 155 (11, M − OH), 144 (55, M − CO), 130 (54, M — C_3H_6), 129 (98, M — C_3H_7), 101 (78, M — C_3H_7 − CO), 69 (100, C_3HO_2), 59 (40, $C_2H_3O_2$).

Compound II is not a secondary metabolite of the microorganism since it was not observed in our previous studies of this strain [2]. The formation of lactones during the microbiological transformations of terpenes has been noted previously [5, 6].

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