

XANTHOTHONE, A NEW NEMATICIDAL N-COMPOUND FROM *Coprinus xanthothrix*

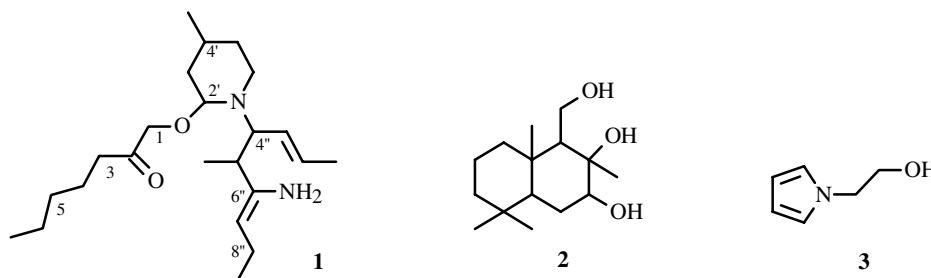
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Coprinus xanthothrix was found to have nematocidal activity. Xanthothone was isolated from culture extract guided by activity assay, which was identified as a novel natural product. Two other compounds were also isolated. These compounds showed nematocidal activity, with LD_{50} value of 125-250 ppm both against *Panagrellus redivivus* and *Meloidogyne incognita*.

Key words: *Coprinus xanthothrix*, nematocidal activity, N-compounds, xanthothone.

Nematophagous fungi greatly contribute to the biological control of plant and animal parasitic nematodes. The production of nematotoxins by these fungi aids in the rapid immobilization and killing of nematodes. At present, more than 90 toxins have been isolated from various fungi [1, 2]. After it was reported that *Coprinus comatus* has nematocidal property [3], three metabolites were cultured, extracted, and isolated from *C. xanthothrix*, and they were tested for their nematocidal activity. They were identified as xanthothone (**1**), 7,8,11-drimanetriol (**2**), and 2-(1H-pyrrol-1-yl) ethanol (**3**).



Compound **1** was obtained as colorless crystals, the formula was determined to be $C_{23}H_{42}O_2N_2$ (m/z : 401.3119[M+Na] $^+$, calcd: 401.3143) by HRESI $^+$ -MS. The IR spectra revealed the presence of NH_2 (3439, 2931 cm^{-1}) and double bonds (1726, 1645 cm^{-1}). The formula suggests that there are two unsaturations. Along with the numbers of methyl and methylene, compound **1** should have a chain. The compound could be colorized by BiI_2 , suggesting that N atoms exist in it.

The ^{13}C NMR and DEPT spectra of compound **1** showed 23 signals (Table 1), including two quaternary carbon atoms (one ketonic carbon). Methylene (δ 68.14 ppm) shifted downfield corresponds to a joined hetero atom. The three methines positioned downfield belong to a double bond carbon. One N atom exists on a piperidine ring and the other N atom is amine. Furthermore, HMBC revealed a methylene joined to a hetero atom, and the ketone group is on the same chain, beyond another one containing a double bond. The ketone and methylene with the hetero atom were separated by two methines. Two of the five methyls were substituted.

Based on the above analysis, compound **1** was elucidated as 1-(1-((2*E*,6*Z*)-6-amino-5-methylnona-2,6-dien-4-yl)-4-methylpiperidin-2-yloxy)heptan-2-one, a novel structure named xanthothone.

Compound **2** was identified as the known structure 7,8,11-drimanetriol [4]. Compound **3** was elucidated as 2-(1H-pyrrol-1-yl) ethanol [5].