Synthesis of 3-methyl-5-nitrobenzyl β, β-diketoester as a derivative of pachydermin, a tetramic acid from Chamonixia pachydermis/ Noor Hidayah Pungot, Zurina Shameeri, Ahmad Sazali Hamzah, Mohd Fazli Mohammat and Noorhana Hussain

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Abstrak

Pachydermin, an oxylated tetramic acid with 3-chloro-4-hydroxyphenyl substituent, was isolated from Chamonixia pachydermis plant, a basidiomycete of New Zealand. Its degradation product exhibits antibacterial activity against Bacillus subtilis, and the derivatives of pachydermin are anticipated to have similar potentials. In this work, a novel approach to synthesize 3-methyl-5-nitrobenzyl β,β-diketoester was developed as a derivative of the natural product pachydermin. The synthetic route began with the synthesis of N-benzylated β,β-diketoester as the key structural moiety, from glycine methyl ester as the starting material. subsequently, oxalyl subunit was inserted, as well as other acyl/alkyl subunits at C-3 position of the β,β-diketoester ring via acylation/alkylation reactions leading to the required intermediates towards pachydermin and its derivatives. alkene functionalities at C-5 position could then be introduced using different alkyl or aryl aldehydes, with the aid of different bases which included diisopropylamine, NaH, Et3N, K2CO3 as well as ionic liquids. insertions of methyl and 4-nitrobenzylidene functionalities at C3- and C5-positions, respectively, were highlighted for the synthesis of the target derivative. selective decarboxylation, ester hydrolysis and N-benzyl deprotection should lead to the required target compound and derivatives. all the synthesized compounds were confirmed by the mass spectroscopy (MS) and nuclear magnetic resonance (NMR) spectroscopy.