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Short Note

3,5-Bis(2-hydroxybenzylidene)piperidin-4-one

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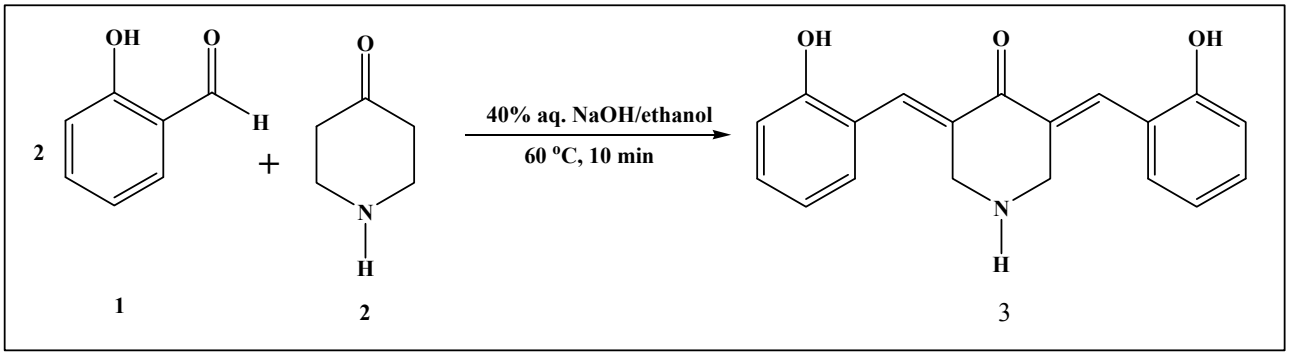
Abstract: The title compound, 3,5-bis(2-hydroxybenzylidene)piperidin-4-one (**3**), was prepared via reaction of 2-hydroxybenzaldehyde (**1**) and 4-piperidone (**2**) under microwave irradiation in the presence of 10% NaOH solution. The compound was fully characterized from its UV, IR, NMR and MS data.

Keywords: curcuminoids; aldol condensation; 4-piperidone

Curcumin is ubiquitous in many *Curcuma* species and is the major pigment found in the tumeric plant, *Curcuma longa*. Chemically, curcumin is a phenolic secondary metabolite known to possess anti-inflammatory [1], antioxidant [2], antiviral, anti-infective and anti-allergic activity [4], as well as anti-HIV [5] and anti-cancer [6] properties. Based on the wide range of its biological activities, curcumin has attracted much interst as a model for new target compounds to be synthesized. However, the isolation of curcuminoids from natural substances is low-yielding (3%–5% of the dry-weight), and in addition, the curcuminoids thus obtained possess limited structural variability. Indeed, this method presents an obstacle to optimize the function of curcumin [7]. Therefore, synthesis of curcumin

analogues is a practical alternative to obtain a reasonable amount of material as well as a wider variety of structural features. These observation led to us to synthesize a new curcumin analog from 2-hydroxybenzaldehyde and 4-piperidone under microwave irradiation (Scheme 1).

Scheme 1. The synthesis of 3,5-bis(2-hydroxybenzylidene)piperidin-4-one.



Experimental

Synthesis of 3,5-Bis(2-hydroxybenzylidene)piperidin-4-one (**3**)

A mixture of 4-piperidone (0.4960 g, 0.01 mol), 2-hydroxybenzaldehyde (1.2212 g, 0.02 mol), 40% aq. NaOH (0.7 mL) and 95% EtOH (5 mL) was stirred at room temperature for 30 min, according to the partially modified procedure of a previous report [8]. The reaction mixture was subjected to microwave irradiation for 3 min at a power of 180 W and temperature of 60 °C. The reaction product was cooled and cold water was added. The precipitate formed was filtered and recrystallized from mixture of *n*-hexane-ethyl acetate to afford **3** (1.1128 g, 74%) as dark red crystals, m.p: 138 °C (decomp.). UV (MeOH) λ_{max}: 316 (ε 6,100). IR (KBr) ν_{max} cm^{-1}: 3399, 3065, 1796, 1658 and 1600. ^{1}H-NMR (Agilent DD2, 500 MHz, $CDCl_3$): δ (ppm) 8.10 (2H, s), 6.87 (2H, dd, *J* = 7.7, 2.0 Hz), 6.77 (2H, dt, *J* = 7.5, 2.0 Hz), 6.17 (2H, d, *J* = 8 Hz), 5.91 (2H, t, *J* = 7.5 Hz), 3.86 (4H, s), 2.40 (1H, br.s). ^{13}C-NMR (125 MHz, $CDCl_3$): δ (ppm) 187.4, 174.0, 134.8, 130.9, 130.7, 128.9, 125.1, 124.5, 107.0, 49.4. HR-ESI-TOFMS: calculated for $C_{19}H_{18}NO_3$ $[M + H]^+$, *m/z* 308.1287, found *m/z* 308.1289.

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Author Contributions

Unang Supratman and Adel Zamri designed the whole experiment and contributed to the manuscript. Yoshihito Shino and Yana M. Syah measured the NMR and HR-ESITOFMS spectra. Yum Eryanti and Tati Herlina synthesize a new curcumin analog and wrote the manuscript. Khalijah Awang and Siti Nadiah Abdul Halim analyzed the NMR and HR-ESITOFMS spectra. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflict of interst.

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