**Optimization for Ultrasonic-Assisted Extraction of *Aframomum melegueta* Phenolics Using Response Surface Methodology**

**Supplementary material**

**Table S1 1H-NMR and 13C-NMR data of compounds C1-C3**

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| --- | --- | --- |
| **Position** | **1H-NMR**(400 MHz, CDCl3, δ in ppm, *J* in Hz) | **13C-NMR** (100 MHz, CDCl3, δ in ppm) |
| **C1** | **C2** | **C3** | **C1** | **C2** | **C3** |
| **1** | 2.74 (2H, t, *J*=7.6) | 2.76 (2H, m) | 2.73 (2H, brd, *J*=6.8) | 31.6 | 31.3 | 31.7 |
| **2** | 2.61 (2H, t, *J*=7.6) | 2.76 (2H, m) | 2.65 (2H, brd, *J*=6.8) | 43.1 | 42.0 | 45.4 |
| **3** |  |  |  | 210.7 | 199.9 | 211.5 |
| **4** | 2.28 (2H, t, *J*=7.6) | 5.99 (1H, d, *J*=16) | 2.44 (2H, m) | 44.6 | 130.3 | 49.4 |
| **5** | 1.47 (2H, t, *J*=6.8) | 6.72 (1H, m) | 3.94 (1H, m) | 23.8 | 147.9 | 67.7 |
| **6** | 1.18 (2H, m) | 2.09 (2H, m | 1.21 (2H, m) | 29.2 | 32.5 | 36.5 |
| **7** | 1.18 (2H, m) | 1.36 (2H, m) | 1.21 (2H, m) | 29.1 | 27.8 | 25.1 |
| **8** | 1.18 (2H, m) | 1.20 (2H, m) | 1.21 (2H, m) | 29.5 | 29.9 | 29.2 |
| **9** | 1.18 (2H, m) | 1.20 (2H, m) | 1.21 (2H, m) | 22.6 | 22.4 | 22.6 |
| **10** | 0.79 (3H, t, *J*=6.8) | 0.81 (3H, t, *J*=6.8) | 0.80 (3H, t, *J*=6.8) | 14.1 | 13.9 | 14.0 |
| **1`** |  |  |  | 133.1 | 133.2 | 132.6 |
| **2`** | 6.61 (1H, brs) | 6.62 (1H, brs) | 6.58 (1H, s) | 111.1 | 111.1 | 111.1 |
| **3`** |  |  |  | 146.4 | 146.5 | 146.6 |
| **4`** |  |  |  | 143.9 | 143.9 | 144.0 |
| **5`** | 6.72 (1H, d, *J*=8) | 6.72 (1H, m) | 6.73 (1H, d, *J*=8) | 114.4 | 114.4 | 114.5 |
| **6`** | 6.56 (1H, dd, *J*= 8, 1.6) | 6.58 (1H, dd, *J*=8, 1.6) | 6.56 (1H, dd, *J*=8, 1.6) | 120.8 | 120.8 | 120.7 |
| **OCH3** | 3.77 (3H, s) | 3.77 (3H, s) | 3.76 (3H, s) | 55.9 | 55.9 | 55.9 |

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**Fig S1 Structure of major compounds isolated from AMS**

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**Fig. 2S 1H-NMR (A) and 13C-NMR (B) spectra of 6-paradol**

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**Fig. 3S 1H-NMR (A) and 13C-NMR (B) spectra of 6-shogaol**

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**Fig. 4S 1H-NMR (A) and 13C-NMR (B) spectra of 6-gingerol**