Electronic supplementary information

Inhibitory properties of saponin from *Eleocharis dulcis* peel against α-glucosidase

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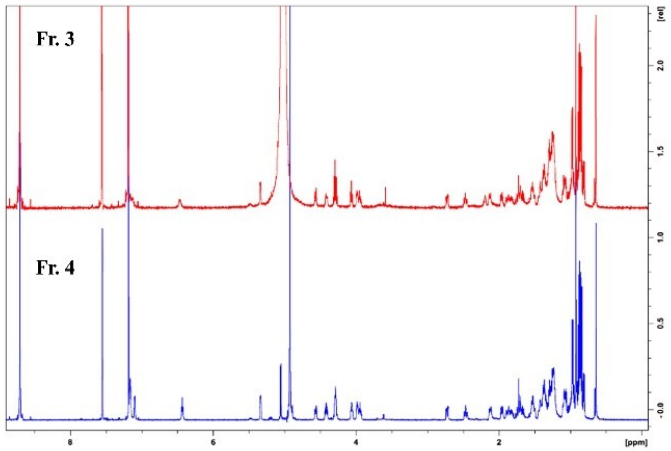
Contents

1. Supplementary Figure

A



B

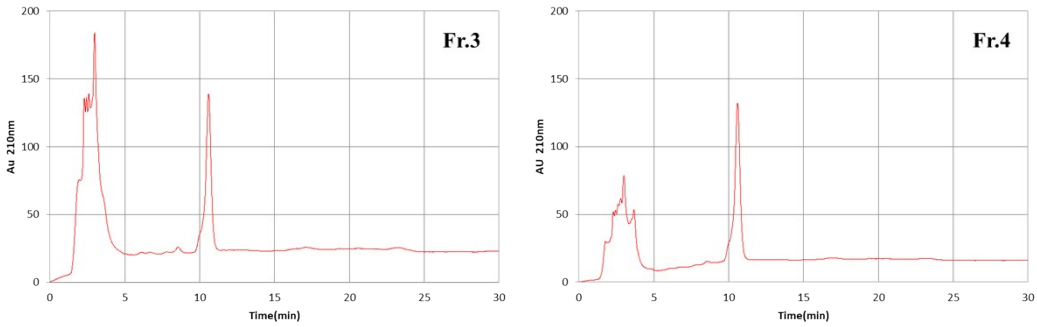


Figure S1. ^{1}H NMR (A) and HPLC (B) analysis of Fr.3 and Fr.4 separated from silica gel column.

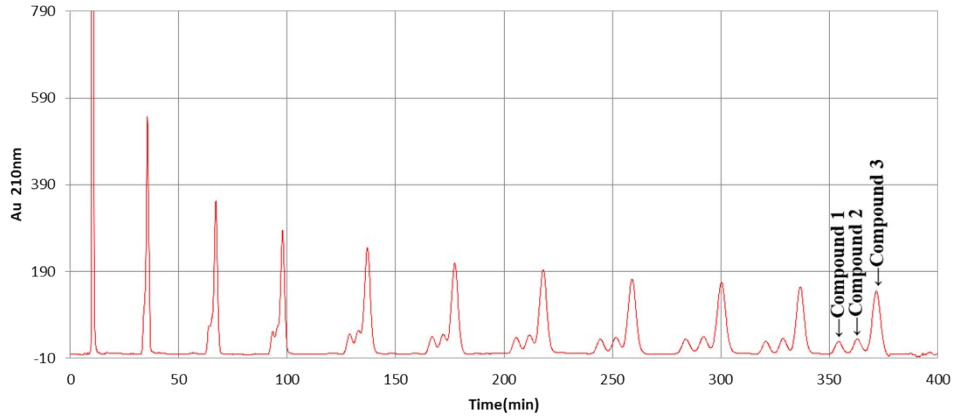


Figure S2. The chromatogram of saponin fraction by Prep LC System with the recycle mode.

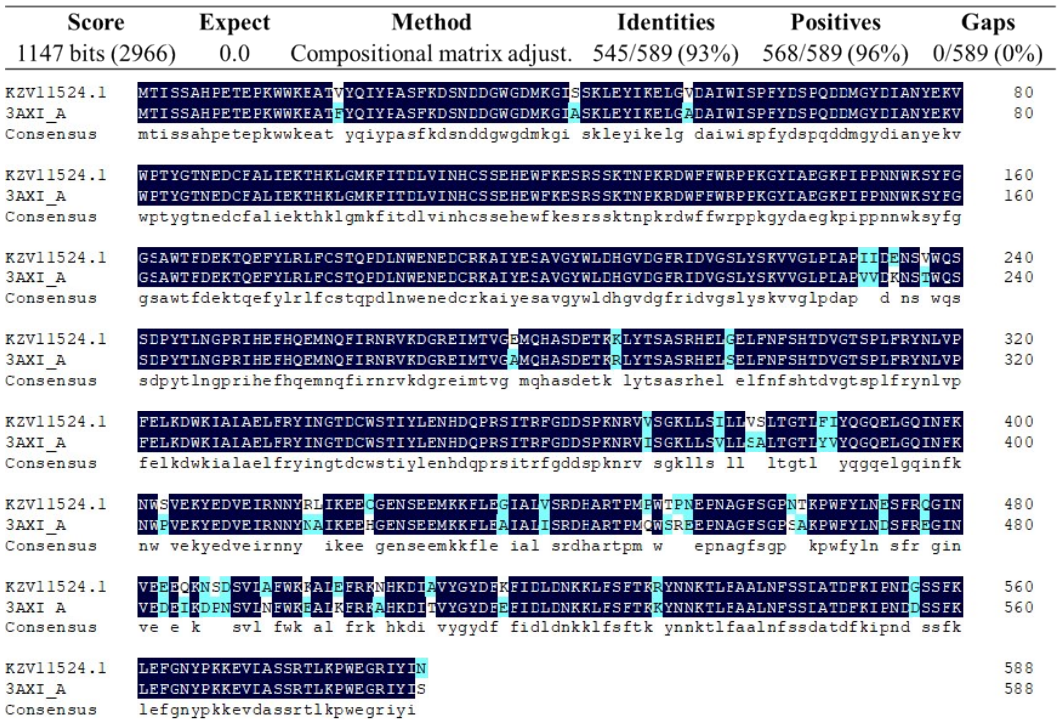


Figure S3. Sequence alignment of the amino acid residue between α-glucosidase (GenBank: KZV11524.1) and isomaltase (PDB: 3AXI_A) from *Saccharomyces cerevisiae*. ■: Identical sequence (homology=100%); ■: similar sequence (homology≥50%); □: different sequence (homology=0%).

2. ^{1}H and ^{13}C NMR Chemical Shifts for Compounds 1-3

Compound **1**: $C_{35}H_{58}O_6$, white amorphous powder. ^{1}H NMR (600 MHz, Pyridine-d_5): 5.34 (1H, dd, J = 4.8, 2.1 Hz, H-6), 5.19 (1H, dd, J = 15.2, 8.8 Hz, Ha-22), 4.58 (1H, ddd, J = 11.8, 5.7, 2.5 Hz, glc. Ha-6'), 4.43 (1H, m, glc. Hb-6'), 4.07 (1H, dd, J = 8.1, 3.5 Hz, glc. H-2'), 2.72 (1H, ddd, J = 13.4, 4.8, 2.3 Hz, Ha-4), 2.47 (1H, m, Hb-4), 1.91 (1H, dd, J = 12.5, 3.5 Hz, Ha-12), 0.89 (3H, d, J = 6.6 Hz, H-26), 0.84 (3H, d, J = 6.6 Hz, H-21), 1.05 (3H, d, J = 6.6 Hz, H-27), 0.86 (3H, t, J = 7.4 Hz, H-29), 0.92 (3H, s, H-19), 0.65 (3H, s, H-18); ^{13}C NMR (600 MHz, Pyridine-d_5): 37.3 (C-1), 30.0 (C-2), 78.3 (C-3), 39.1 (C-4), 140.7 (C-5), 121.7 (C-6), 31.9 (C-7), 31.8 (C-8), 50.1 (C-9), 36.7 (C-10), 21.0 (C-11), 39.6 (C-12), 42.1 (C-13), 56.7 (C-14), 24.3 (C-15), 29.1 (C-16), 55.8 (C-17), 11.9 (C-18), 19.2 (C-19), 40.6 (C-20), 19.0 (C-21), 138.6 (C-22), 129.2 (C-23), 51.2 (C-24), 32.0 (C-25), 21.1 (C-26), 21.3 (C-27), 25.5 (C-28), 12.3 (C-29), 102.3 (C-1′), 75.1 (C-2′), 78.4 (C-3′), 71.5 (C-4′), 77.8 (C-5′), 62.6 (C-6′).

Compound **2**: $C_{34}H_{58}O_6$, white amorphous powder. ^{1}H NMR (600 MHz, Pyridine-d_5): 5.34 (1H, dd, J = 4.8, 2.1Hz, H-6), 5.06 (1H, d, J = 7.7 Hz, glc. H-1'), 4.56 (1H, ddd, J = 11.8, 5.6, 2.5 Hz, glc. Ha-6'), 4.42 (1H, m, glc. Hb-6'), 4.06 (1H, dd, J = 8.5, 3.8 Hz, glc. H-2'), 2.73 (1H, ddd, J = 13.4, 4.8, 2.3 Hz, Ha-4), 2.47 (1H, m, Hb-4), 2.12, (1H, m, Ha-2), 1.96 (1H, dd, J = 12.7, 3.3 Hz, Ha-12), 0.95 (3H, d, J = 6.5 Hz, H-21), 0.92 (3H, s, H-19), 0.87 (3H, d, J = 6.8 Hz, H-27), 0.82 (3H, d, J = 6.8 Hz, H-26), 0.81 (3H, d, J = 6.5 Hz, H-28), 0.65 (3H, s, H-18); ^{13}C NMR (600 MHz, Pyridine-d_5): 37.3 (C-1), 30.0 (C-2), 78.3 (C-3), 39.1 (C-4), 140.7 (C-5), 121.7 (C-6), 32.0 (C-7), 31.8 (C-8), 50.1 (C-9), 36.7 (C-10), 21.1 (C-11), 39.7 (C-12), 42.3 (C-13), 56.6 (C-14), 24.2 (C-15), 28.3 (C-16), 56.1 (C-17), 11.8 (C-18), 19.2 (C-19), 35.9 (C-20), 18.7 (C-21), 33.8 (C-22), 30.4 (C-23), 38.8 (C-24), 32.4 (C-25), 18.1 (C-26), 20.1 (C-27), 15.3 (C-28), 102.4 (C-1′), 75.1 (C-2′), 78.4 (C-3′), 71.5 (C-4′), 77.9 (C-5′), 62.6 (C-6′).

Compound **3**: $C_{35}H_{60}O_6$, white amorphous powder. ^{1}H NMR (600 MHz, Pyridine-d_5): 5.34 (1H, dd, J = 4.8, 2.1 Hz, H-6), 5.05 (1H, d, J = 7.7 Hz, glc. H-1'), 4.56 (1H, ddd, J = 11.8, 5.6, 2.5 Hz, glc. Ha-6'), 4.42 (1H, m, glc. Hb-6'), 4.06 (1H, dd, J = 8.0, 3.6

Hz, glc. H-2'), 2.72 (1H, ddd, *J* = 13.4, 4.8, 2.3 Hz, Ha-4), 2.47 (1H, m, Hb-4), 1.96 (1H, dd, *J* = 12.5, 3.5 Hz, Ha-12), 0.97 (3H, d, *J* = 6.5 Hz, H-21), 0.92 (3H, s, H-19), 0.88 (3H, t, *J* = 7.4 Hz, H-29), 0.87 (3H, d, *J* = 6.8 Hz, H-27), 0.85 (3H, d, *J* = 6.8 Hz, H-26), 0.65 (3H, s, H-18); ^{13}C NMR (600 MHz, Pyridine-d_5): 37.3 (C-1), 30.0 (C-2), 78.3 (C-3), 39.1 (C-4), 140.7 (C-5), 121.7 (C-6), 31.9 (C-7), 31.8 (C-8), 50.1 (C-9), 36.7 (C-10), 21.0 (C-11), 39.7 (C-12), 42.3 (C-13), 56.6 (C-14), 24.2 (C-15), 28.3 (C-16), 56.0 (C-17), 11.7 (C-18), 19.2 (C-19), 36.1 (C-20), 18.9 (C-21), 33.9 (C-22), 26.1 (C-23), 45.3 (C-24), 29.2 (C-25), 18.7 (C-26), 19.7 (C-27), 23.1 (C-28), 11.9 (C-29), 102.4 (C-1′), 75.1 (C-2′), 78.4 (C-3′), 71.5 (C-4′), 77.9 (C-5′), 62.6 (C-6′).