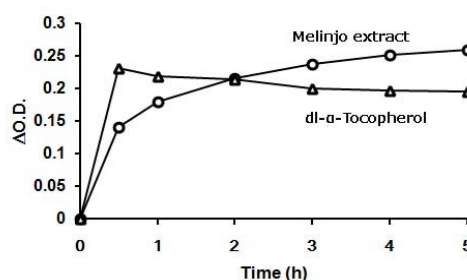
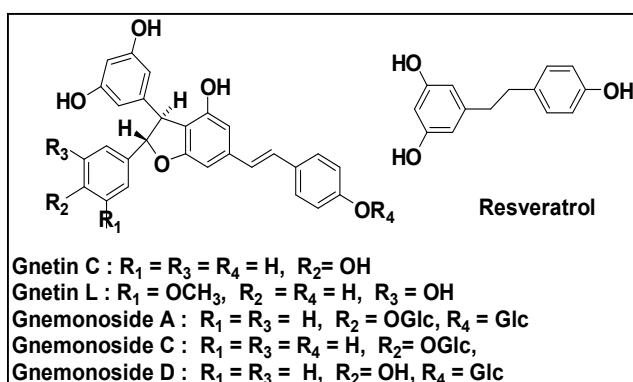


Stilbenoids Isolated from Seeds of Melinjo (*Gnetum gnemon*L.) and Their Biological Activity

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A 50% EtOH extract of the dried endosperms of melinjo (*Gnetum gnemon* L.) was purified by a combination of column chromatography, including highly porous polymer, octadecylated silica (ODS), hydroxylpropylated dextran (LH-20), and silica gel, resulting in the isolation of a new stilbenoid 1, named gnetin L, along with five previously identified stilbenoids 2-6 (gnetin C, gnemonosides A, C, and D, and resveratrol). All of these stilbenoids showed 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity similar to that of ascorbic acid and dl- α -tocopherol. With the exception of gnemonoside A (3), these stilbenoids showed moderate antimicrobial activity. Inhibition of lipase from porcine pancreas was recognized in four stilbenoids excluding gnemonoside A (3) and resveratrol (6). Gnetin C (2), gnemonoside C (4), and gnemonoside D (5) inhibited the hydrolysis of starch by α -amylase from porcine pancreas. An EtOH extract containing these stilbenoids also showed DPPH radical scavenging effect, lipase and R-amylase inhibition activity, and antimicrobial activity against food microorganisms and enteric



ED₅₀ (5h) of melinjo extract: 23 μ g/mL
 DPPH radical (50 μ M) scavenging activity

Concentration Scavenged for Half of DPPH Radicals (ED₅₀, μ M)

| Sample | 0.5 h | 5 h |
|--------------------------|----------------|----------------|
| Gnetin C | 19.7 \pm 0.8 | 10.7 \pm 1.6 |
| Gnetin L | 17.0 \pm 0.8 | 11.1 \pm 0.2 |
| Gnemonoside A | 14.9 \pm 1.5 | 8.3 \pm 0.7 |
| Gnemonoside C | 21.4 \pm 0.5 | 11.3 \pm 0.1 |
| Gnemonoside D | 18.9 \pm 0.4 | 9.4 \pm 0.8 |
| Resveratrol | 16.7 \pm 1.2 | 13.2 \pm 0.8 |
| Ascorbic acid | 14.7 \pm 0.4 | 14.1 \pm 0.3 |
| dl- α -Tocopherol | 15.1 \pm 0.9 | 17.1 \pm 1.7 |

DPPH radical concentration = 50 μ M

Inhibitory Activities against Pancreatic Digestive Enzymes (IC₅₀)

| Sample | lipase | amylase |
|--------------------------|-----------------|--------------|
| Melinjo extract (mg/mL) | 11.6 \pm 9.4 | 352 \pm 84 |
| Gnetin C (μ M) | 12.2 \pm 1.8 | 203 \pm 57 |
| Gnetin L (μ M) | 7.2 \pm 1.8 | >1000 |
| Gnemonoside A (μ M) | 125.7 \pm 6.4 | >1000 |
| Gnemonoside C (μ M) | 19.6 \pm 3.0 | 840 \pm 74 |
| Gnemonoside D (μ M) | 41.4 \pm 2.5 | 277 \pm 54 |
| Resveratrol (μ M) | >200 | >1000 |

Antimicrobial Action (pH 7; MIC, μ g/mL)

| Sample | <i>B. subtilis</i> | <i>E. coli</i> | <i>S. cerevisiae</i> | <i>P. expansum</i> |
|----------------------|--------------------|----------------|----------------------|--------------------|
| Melinjo extract | 250 | 2500 | 3000 | 3000 |
| Gnetin C | 20 | 1000 | 1000 | 1000 |
| Gnetin L | 10 | >3000 | >3000 | >3000 |
| Gnemonoside A | >3000 | >3000 | >3000 | >3000 |
| Gnemonoside C | 500 | >3000 | >3000 | >3000 |
| Gnemonoside D | 250 | >3000 | >3000 | >3000 |
| Resveratrol | 500 | >3000 | 2000 | >3000 |
| Sorbic acid (pH 6.5) | >3000 | >3000 | >3000 | >3000 |

Cultivated at 30 °C for 72 h. The sample solution of sorbic acid was neutralized with 0.5 M NaOH.

| | | | | |
|-----------------|-------------------------|-----|-----------------------|------|
| Melinjo extract | <i>L. mesenteroides</i> | 250 | <i>C. perfringens</i> | 250 |
| | <i>L. plantarum</i> | 500 | <i>B. bifidum</i> | 2500 |