APPENDICES

Appendix A:

Precision and Accuracy of Each Protocols

1. ABTs decolorization assay

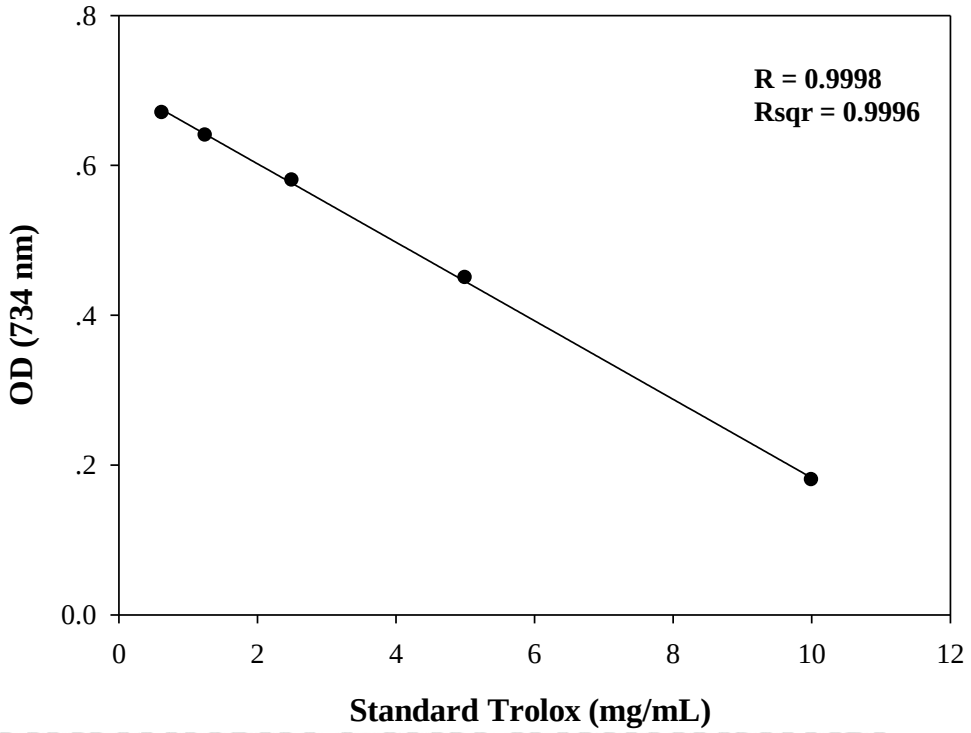

Figure 4.8 Standard curve of trolox in ABTs decolorization assay at 0.02, 0.039, 0.078, 0.156, 0.312, 0.625, 1.25, 2.5, 5.0 and 10.0 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.02 mg/mL.

2. Total phenolic assay

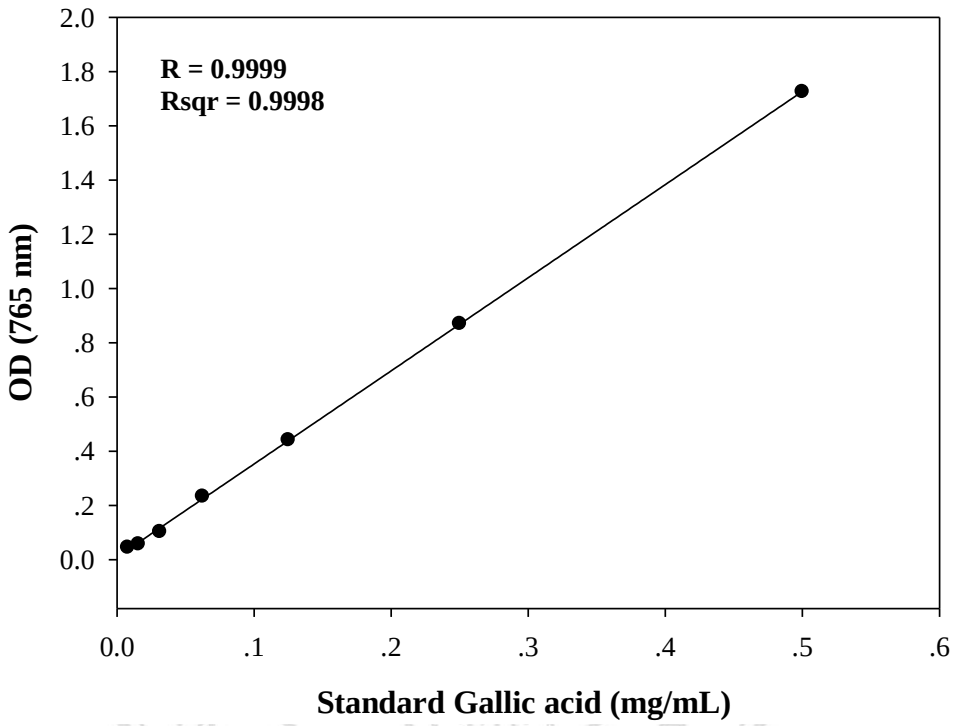

Figure 4.9 Standard curve of gallic acid in total phenolic assay at 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.004 mg/mL.

3. Total tannin

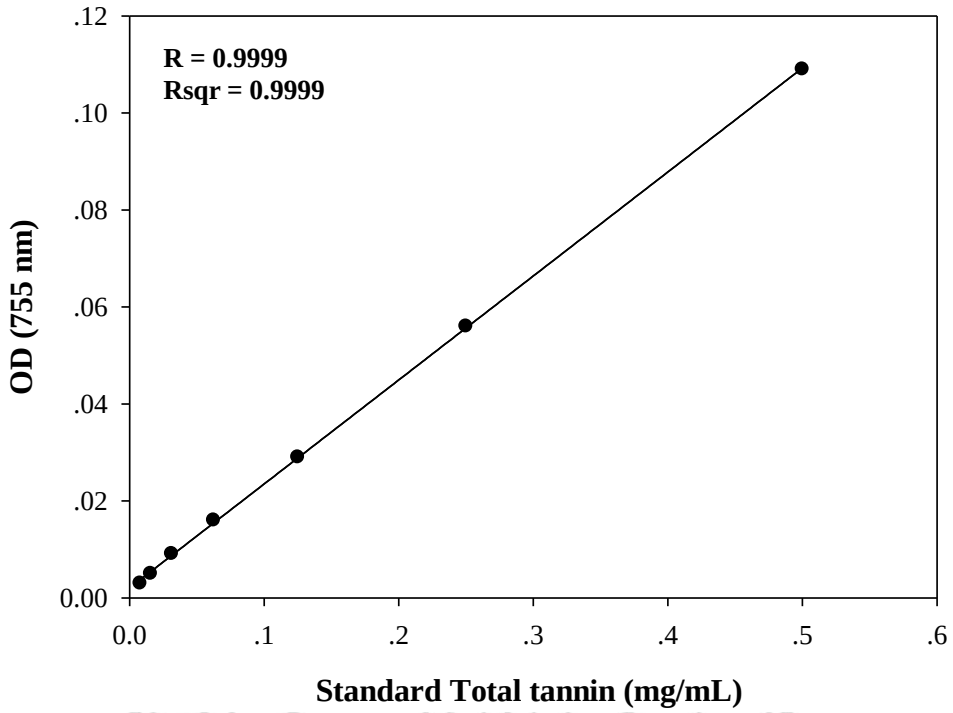

Figure 5.0 Standard curve of tannin at 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.004 mg/mL.

4. Catechins

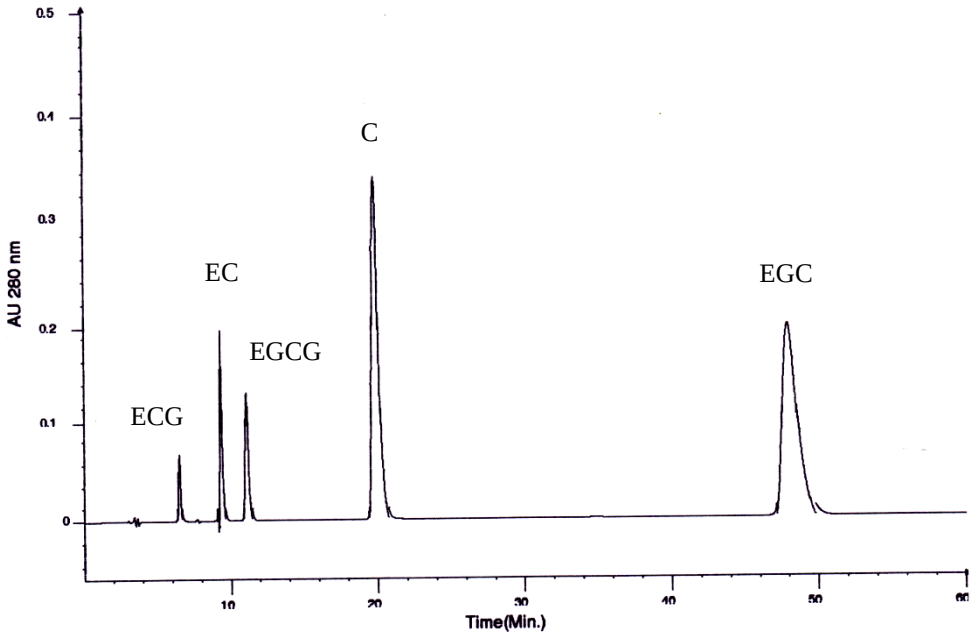

Figure 5.1 The HPLC-chromatogram of standard catechins (EGC, C, EGCG, EC and ECG) from UV detector at 280 nm with different retention times (RT); ECG (7.21 min), EC (11.72 min), EGCG (12.45 min), C (20.01 min) and EGC (49.03 min), respectively.

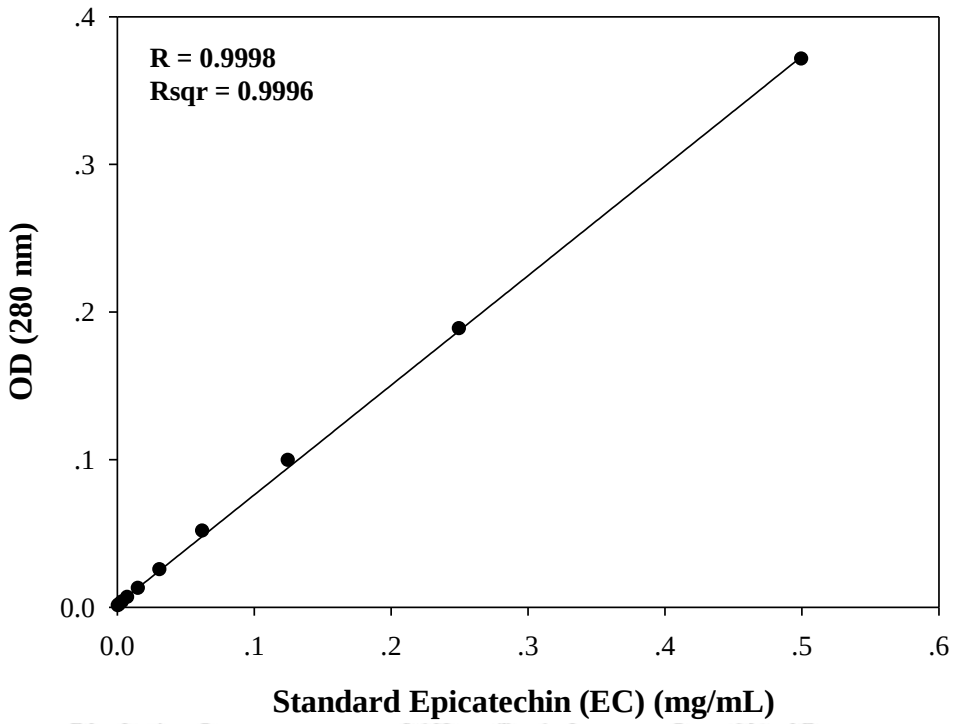

Figure 5.2 Standard curve of epicatechin (EC) at 0.0005, 0.001, 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.5 µg/mL.

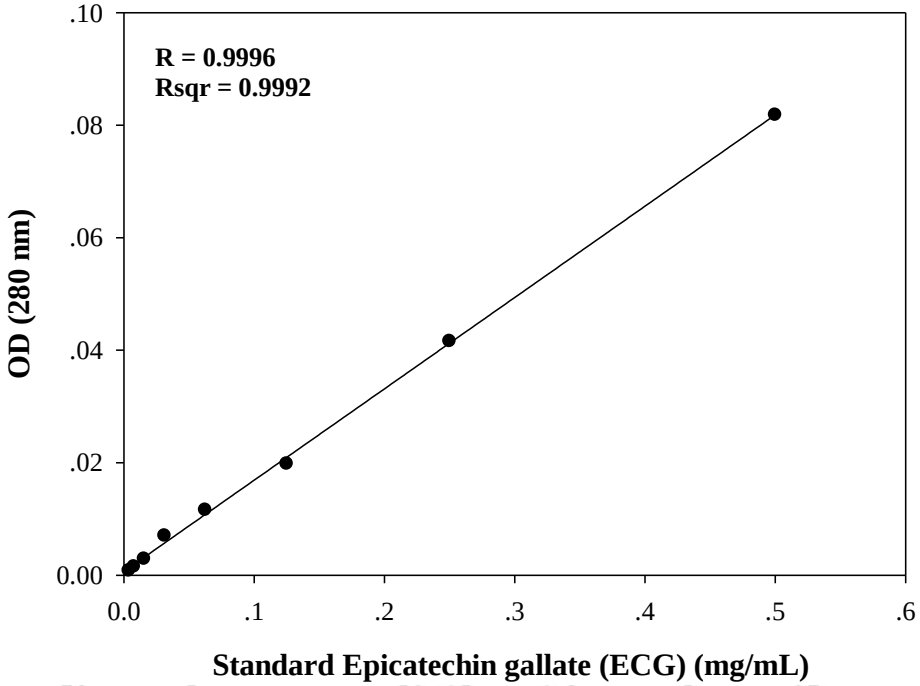

Figure 5.3 Standard curve of epigallocatechin (ECG) at 0.002, 0.004, 0.008, 0.016, 0.031, 0.062, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.002 mg/mL.

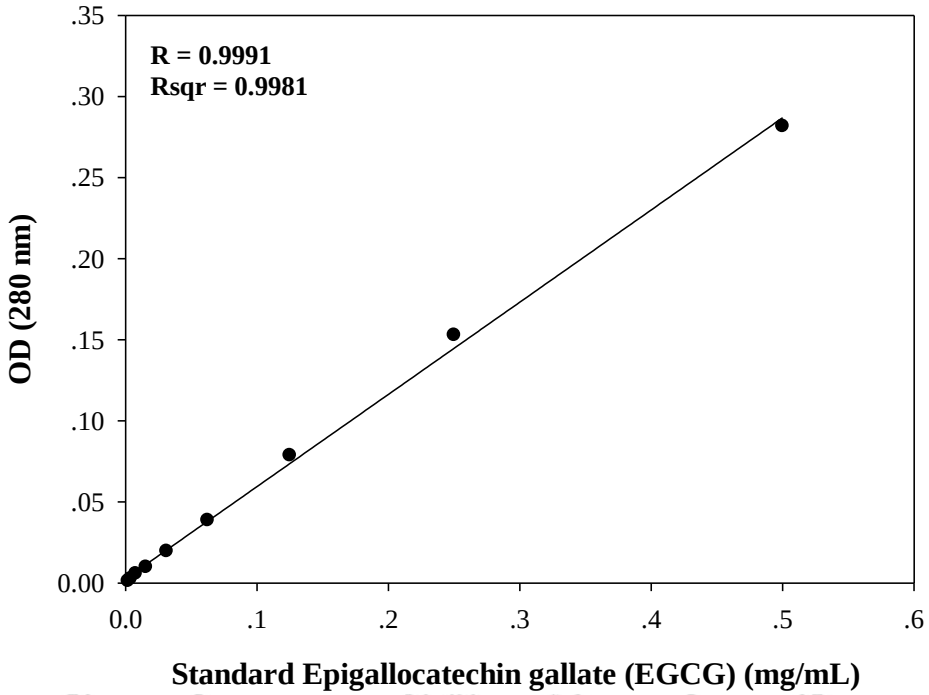

Figure 5.4 Standard curve of epigallocatechin gallate (EGCG) at 0.001, 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.001 mg/mL.

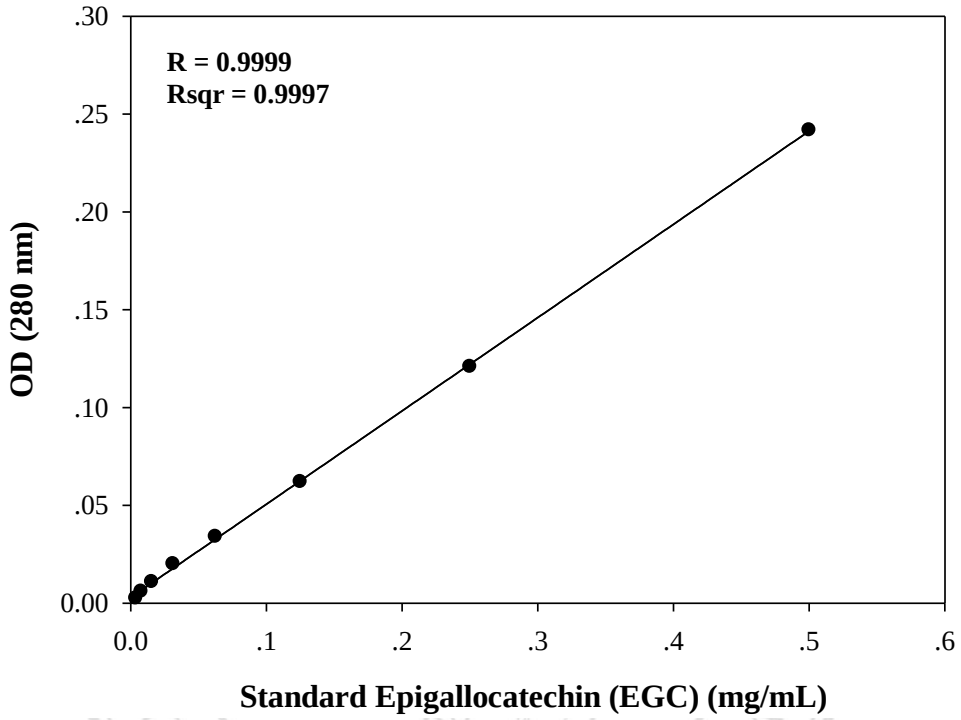

Figure 5.5 Standard curve of epigallocatechin (EGC) at 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.002 mg/mL.

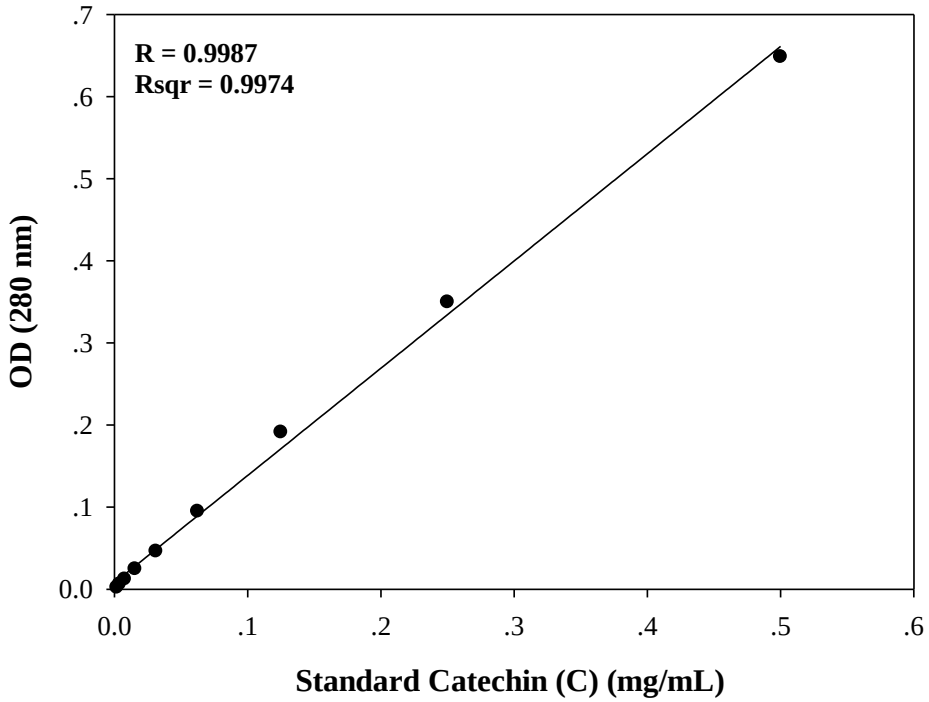

Figure 5.6 Standard curve of catechin (C) at 0.0005, 0.001, 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.5 µg/mL.

5. Isoflavone

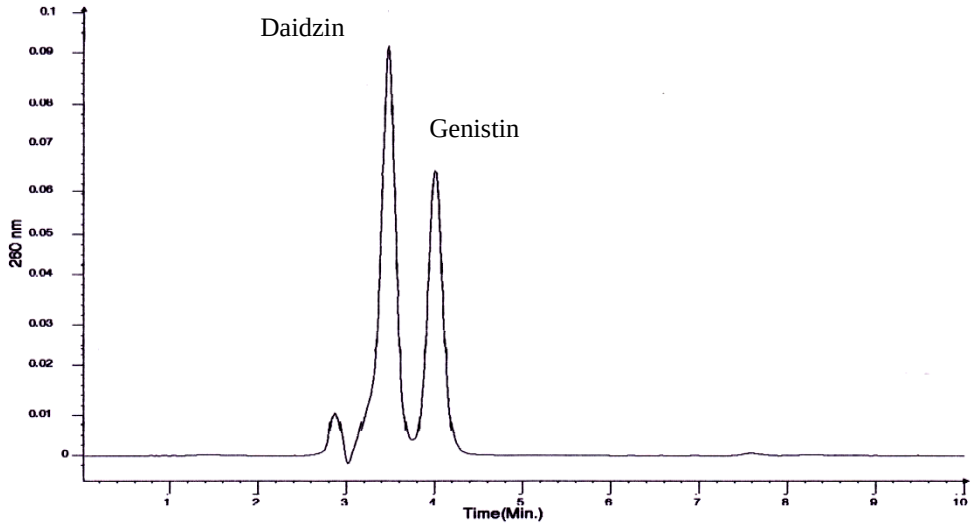

Figure 5.7 The HPLC-chromatogram of standard isoflavone (daidzin and genistin) from UV detector at 260 nm with different retention times (RT); daidzin (3.58 min) and genistin (4.03 min).

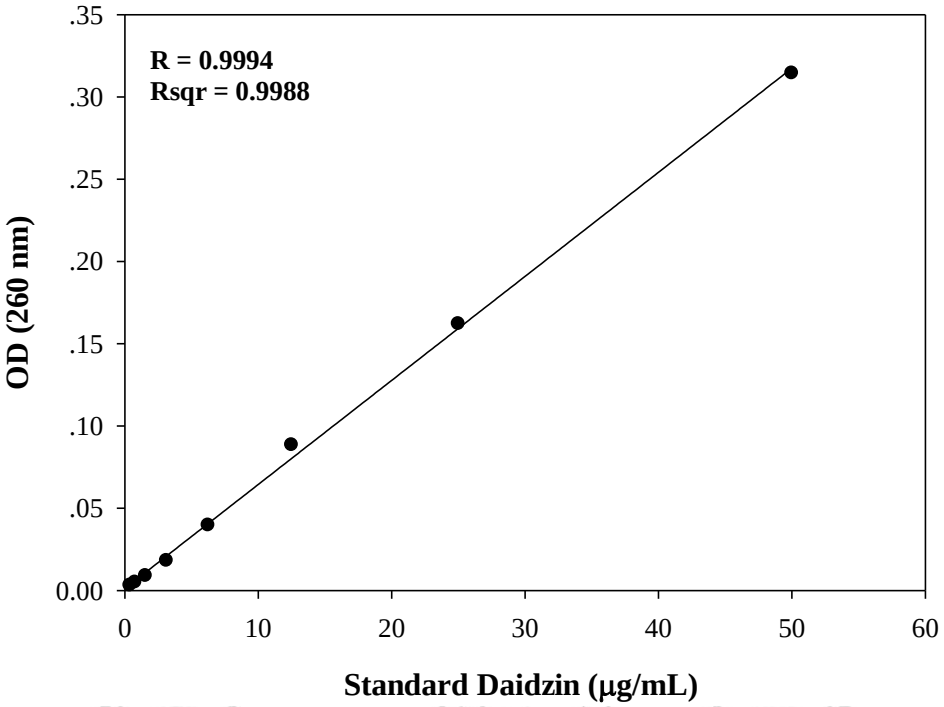

Figure 5.8 Standard curve of daidzin 0.20, 0.39, 0.78, 1.56, 3.125, 6.25, 12.5, 25 and 50 µg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.20 µg/mL.

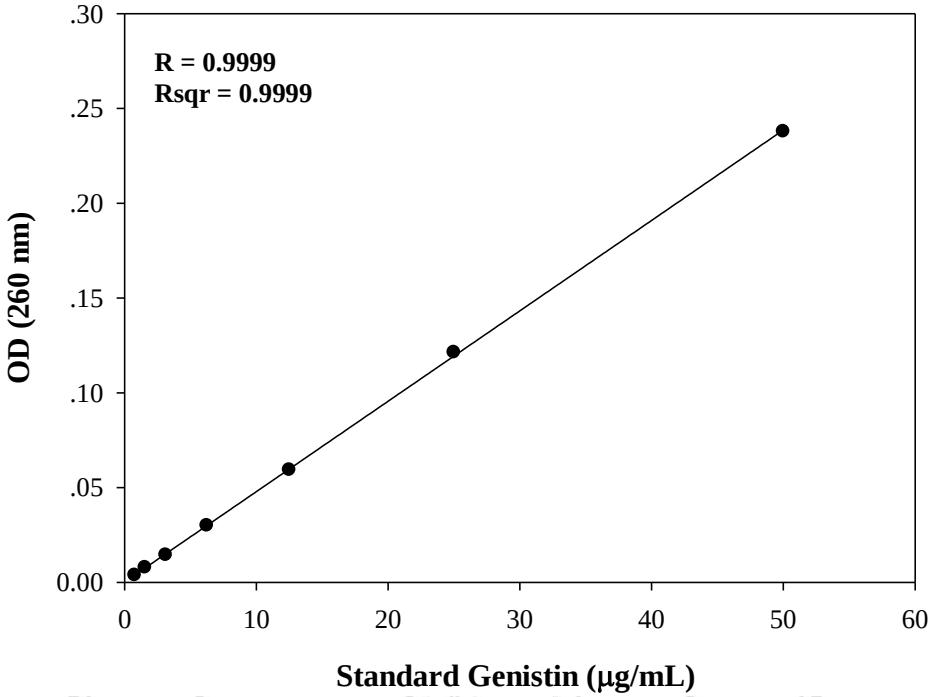

Figure 5.9 Standard curve of genistin at 0.39, 0.78, 1.56, 3.125, 6.25, 12.5, 25 and 50 µg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.39 µg/mL.

6. Flavonoid

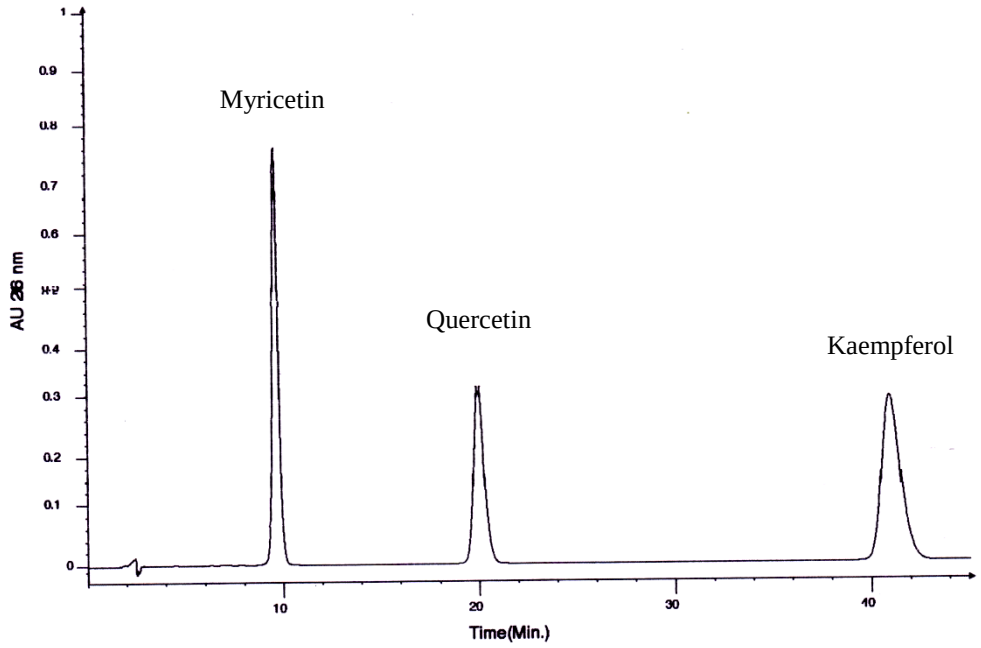

Figure 6.0 The HPLC-chromatogram of standard flavonoid (myricetin, quercetin and kaempferol) from UV detector at 266 nm with different retention times (RT); myricetin (10.28 min), quercetin (22.12 min) and kaempferol (43.87 min), respectively.

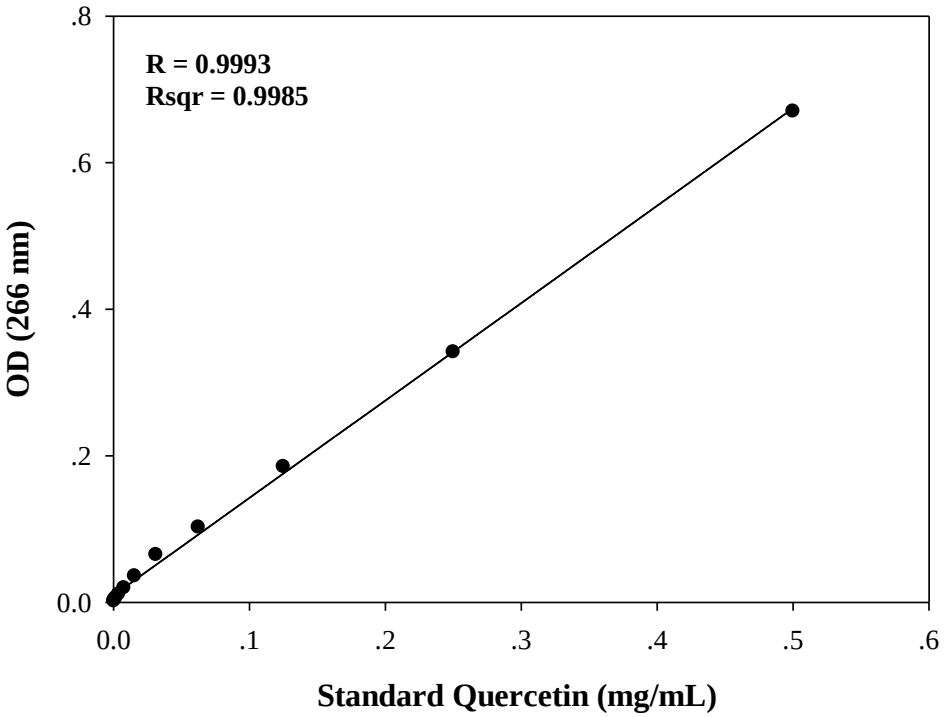

Figure 6.1 Standard curve of quercetin at 0.0003, 0.0005, 0.001, 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.3 µg/mL

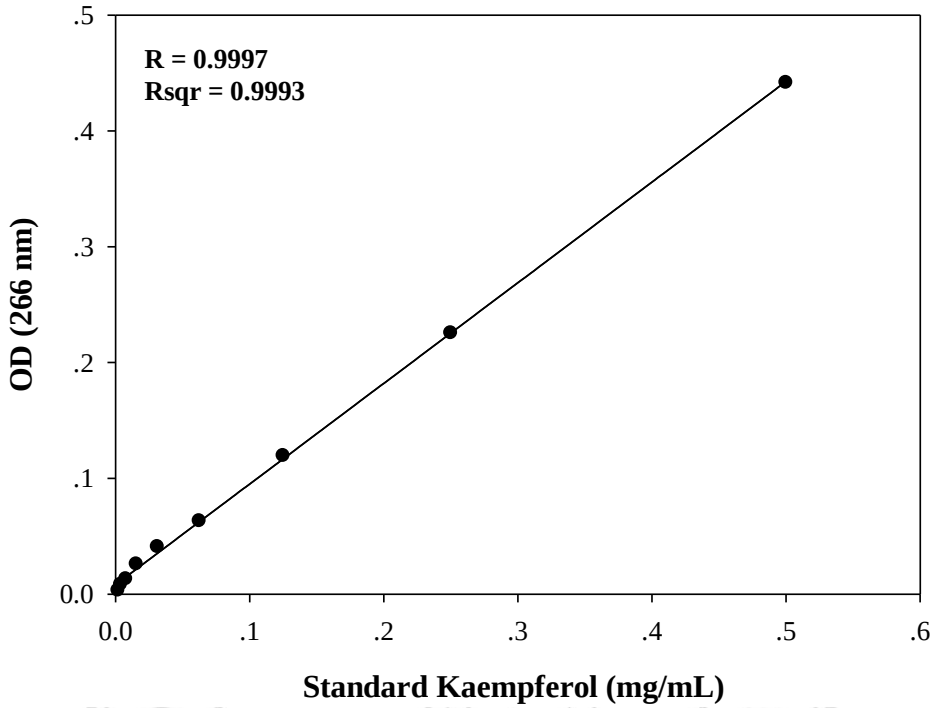

Figure 6.2 Standard curve of kaempferol at 0.001, 0.002, 0.004, 0.008, 0.016, 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.01 mg/mL

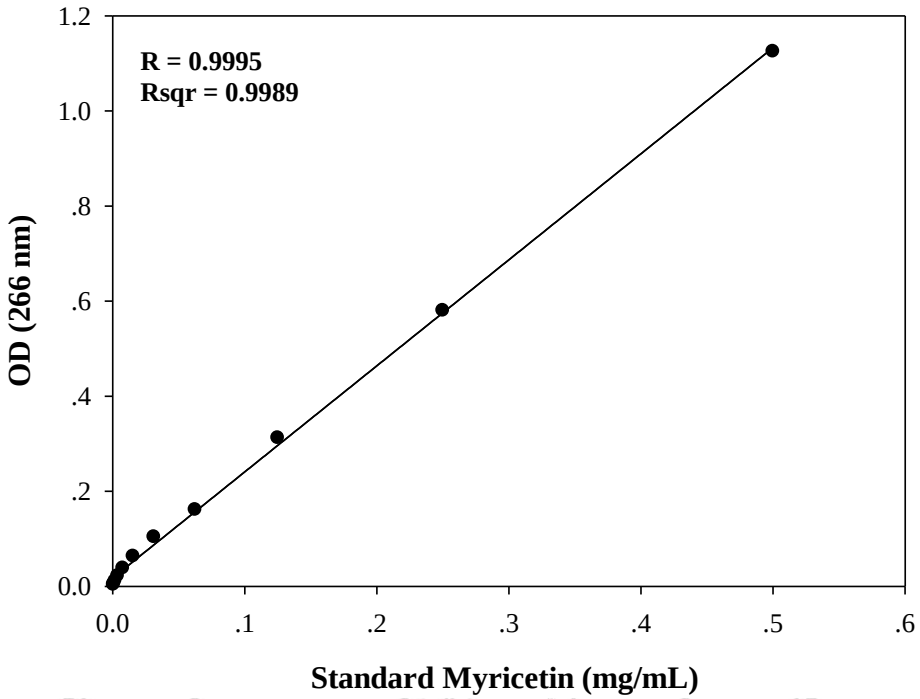

Figure 6.3 Standard curve of myricetin at 0.0003, 0.0005, 0.001, 0.002, 0.004, 0.008, 0.016, 0.0313, 0.0625, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.3 µg/mL

7. Nitrite and Nitrate

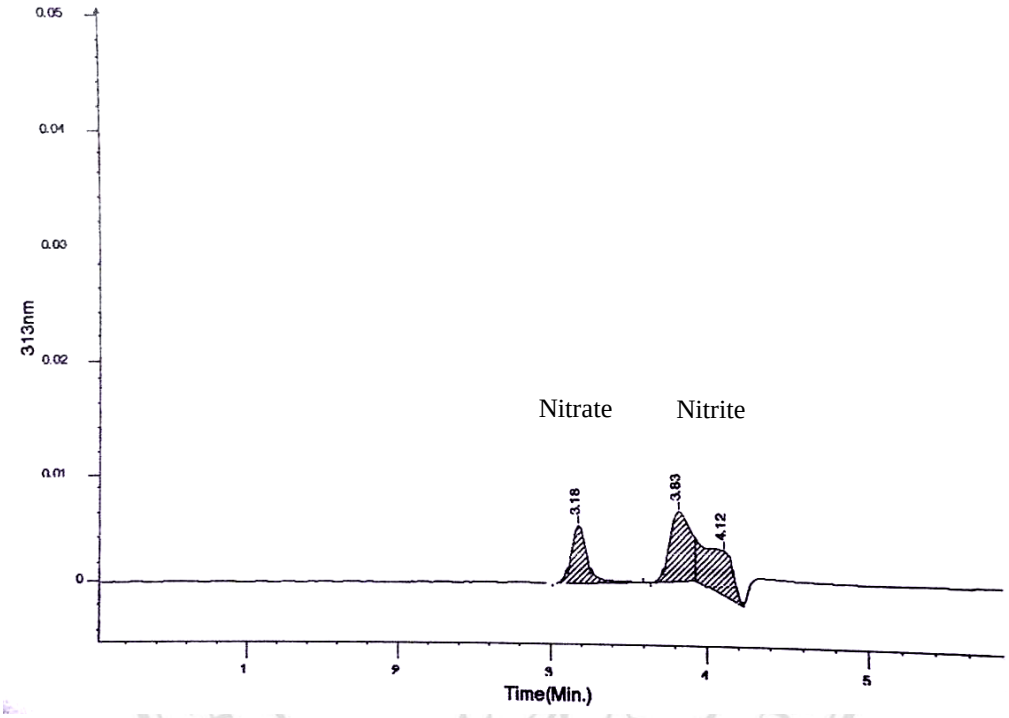

Figure 6.4 The HPLC-chromatogram of standard nitrite and nitrate from UV detector at 313 nm with different retention times (RT); nitrate (3.15 min) and nitrite (3.90 min).

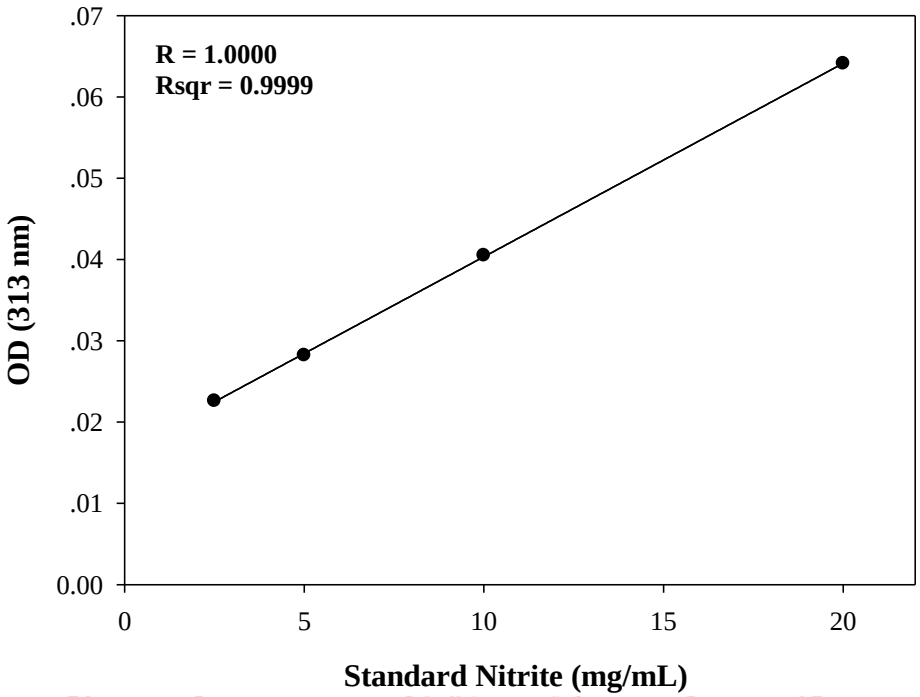

Figure 6.5 Standard curve of nitrite at 2.5, 5, 10 and 20 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 1.25 mg/mL

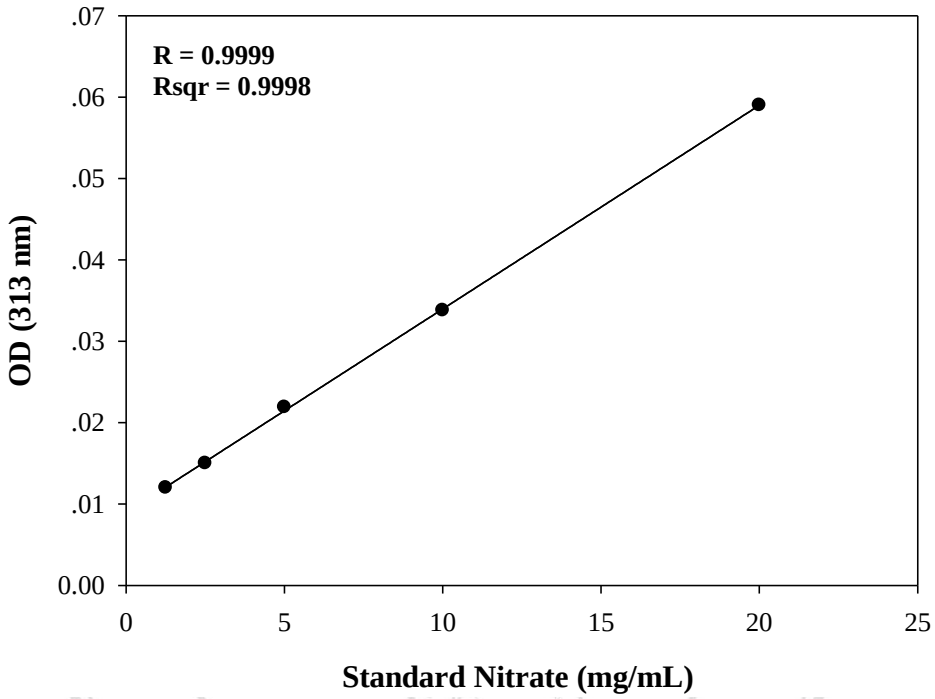

Figure 6.6 Standard curve of nitrate at 1.25, 2.5, 5, 10 and 20 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.6 mg/mL

8. Nicotine

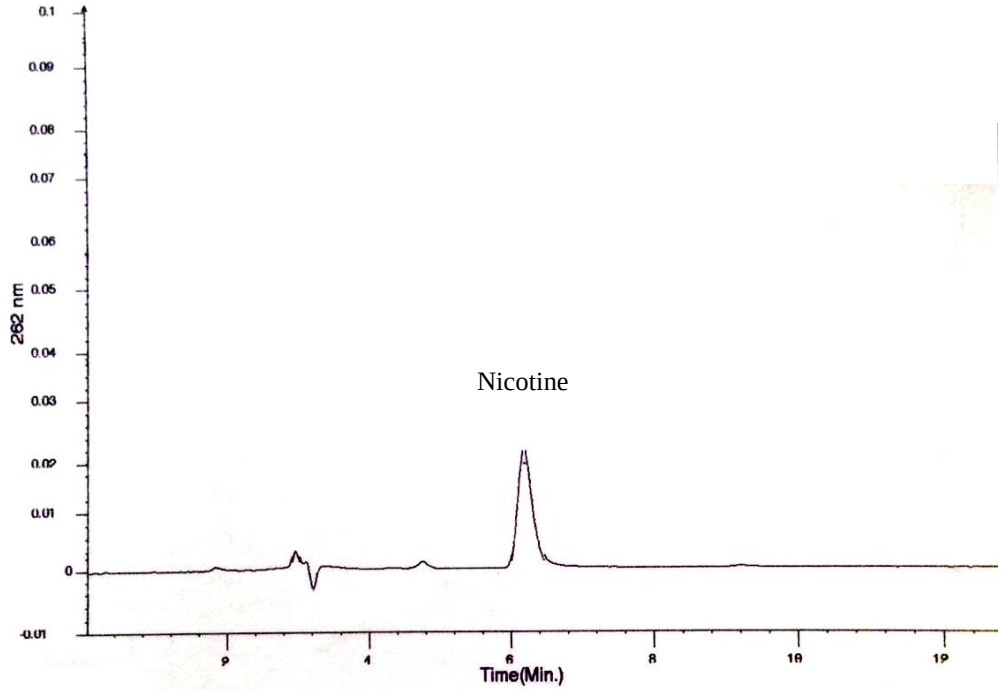

Figure 6.7 The HPLC-chromatogram of standard nicotine from UV detector at 260 nm with specific retention time (RT) of nicotine at 6.88 min.

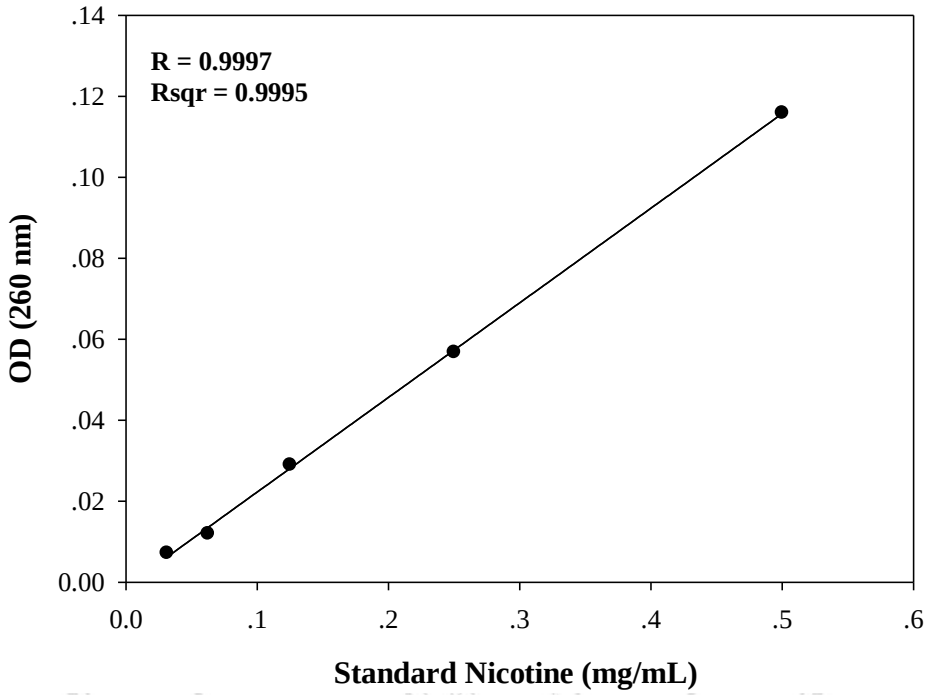

Figure 6.8 Standard curve of nicotine at 0.031, 0.063, 0.125, 0.25 and 0.5 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.016 mg/mL

9. Caffeine

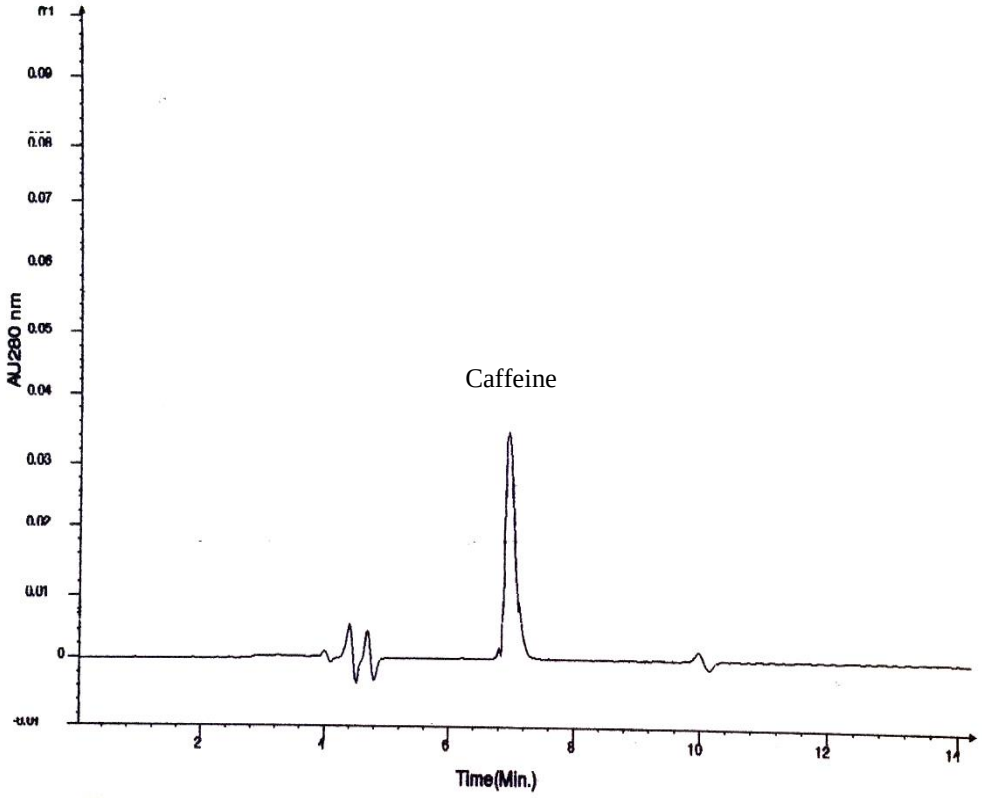

Figure 6.9 The HPLC-chromatogram of standard caffeine from UV detector at 280 nm with specific retention time (RT) at 6.97 min.

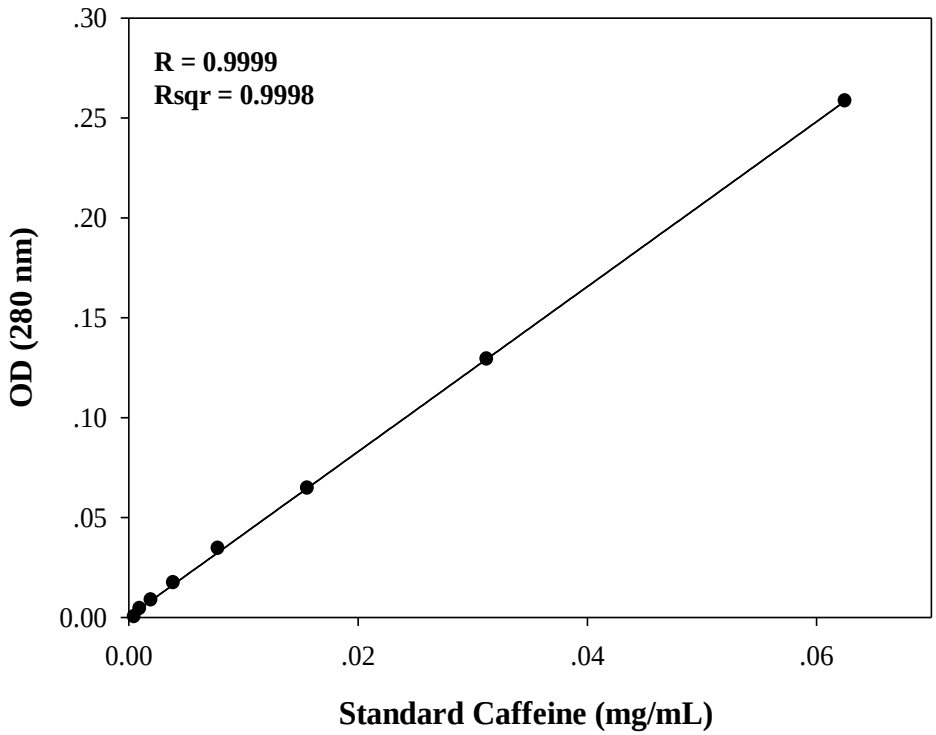

Figure 7.0 Standard curve of caffeine at 0.0005, 0.001, 0.002, 0.004, 0.008, 0.016, 0.0313 and 0.0625 mg/mL, respectively. The limitation of qualitative concentration (LOQ) is 0.5 µg/mL

10. Malondialdehyde (MDA) by TBARs

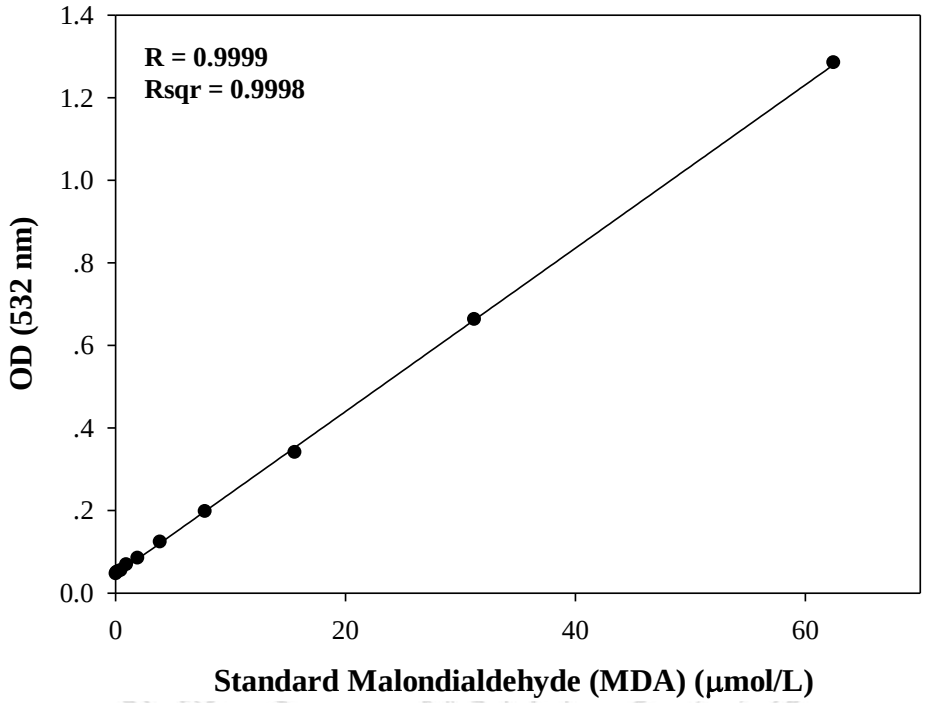

Figure 7.1 Standard curve of malondialdehyde (MDA) by TBARs at 0.031, 0.061, 0.122, 0.244, 0.488, 0.977, 1.953, 3.907, 7.813, 15.625, 31.25 and 62.50 µmol/L, respectively. The limitation of qualitative concentration (LOQ) is 0.031 µmol/L

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2003-2006	Bachelor of Science (Sport science), Faculty of Sport science, Kasetsart University Kamphaeng Saen Campus, Nakhonpathom, Thailand.
2007-2010	Master of Science (Movement and Exercise Sciences), Faculty of Associated Medical Science, Chiang Mai University, Chiang Mai, Thailand.
2010-2016	Doctor of philosophy in (Biomedical science), Faculty of Associated Medical Science, Chiang Mai University, Chiang Mai, Thailand.

Publication(s)

Ketsuwan N, Leelarungrayub J, Kothan S, Singhatong S. Antioxidant Compounds and Activities of the Stem, Flower and Leaf Extracts of the Anti-Smoking Thai Medicinal Plant: *Vernonia cinerea* Less. *Drug Design, Development and Therapy*. 2017; 11: 383-391.

Ketsuwan N, Leelarungrayub J, Banchonglikitkul C. Effects of Thai Medicinal Plant; *Vernonia cinerea* Less. Extracts on Catecholamine, Oxidative Stress and Chromosome Aberration in Nicotine-Treated Rats. *Bull Chiang Mai Assoc Med Sci*. In press 2017.

Laskin JJ, Tairattanasuwan T, Rungsawat U, **Ketsuwan N**, Szczepkowski M, Kochanowski J, Czyzewski P, Malzcewski D, Molik B. Improving Accelerometry Derived Estimations of Energy Expenditure in Individuals with Locomotor Dysfunction: 1795 Board#6 June 2, 1:00 PM-3:00 PM. Med Sci Sports Exerc. 2016 May; 48 (5 Suppl 1): 489.

Leelarungrayub D, **Ketsuwan N**, Pothongsunun P, Klaphajone J, & Bloomer RJ. Effects of *N*-acetylcysteine on oxidative stress, interleukin-2, and running time in sedentary men. *Gazzetta Medica Italiana Archivio per le Scienze Mediche*. 170 (4): 239-50, 2011.

Poster presentation

Ketsuwan N, Leelarungrayub D, Banchonglikitkul C. Antioxidant activity and Capacity of *Vernonia Cinerea L.* for stop smoking *in Vitro* and *in Vivo*. The 15th World Conference on Tobacco or Health (WCTOH 2012). March 20-24, 2012, Singapore (Poster presentation).