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APPENDICES

APPENDIX A

P. emblica fruits extraction



Figure 35 Maceration extraction of *P. emblica* dried fruits powder

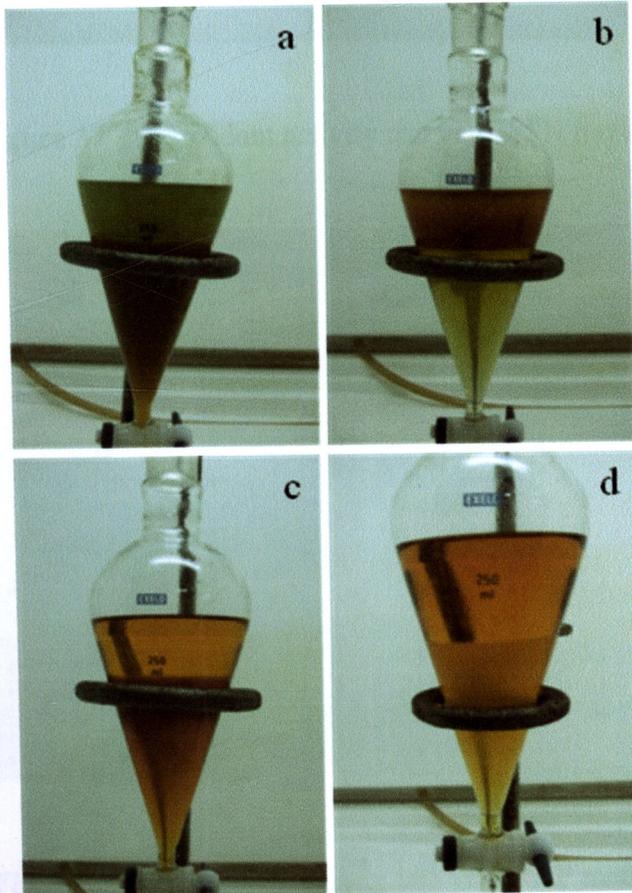


Figure 36 Separation extraction of *P. emblica* extract with hexane (a), chloroform (b), ethyl acetate (c), and butanol (d)

APPENDIX B

Antioxidation and antiglycation activity testing

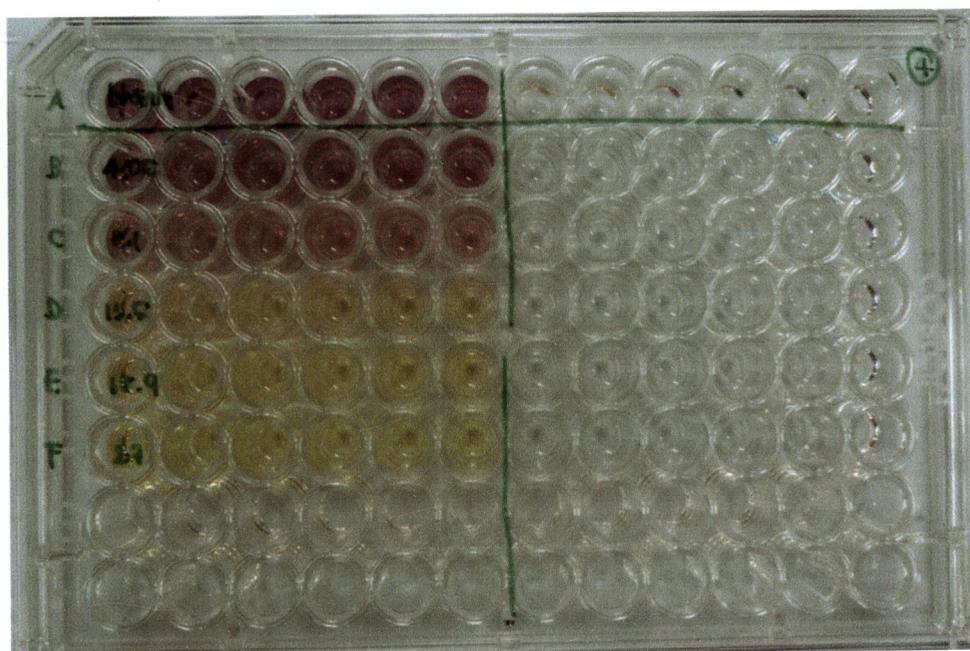


Figure 37 Antioxidant activity test via DPPH method

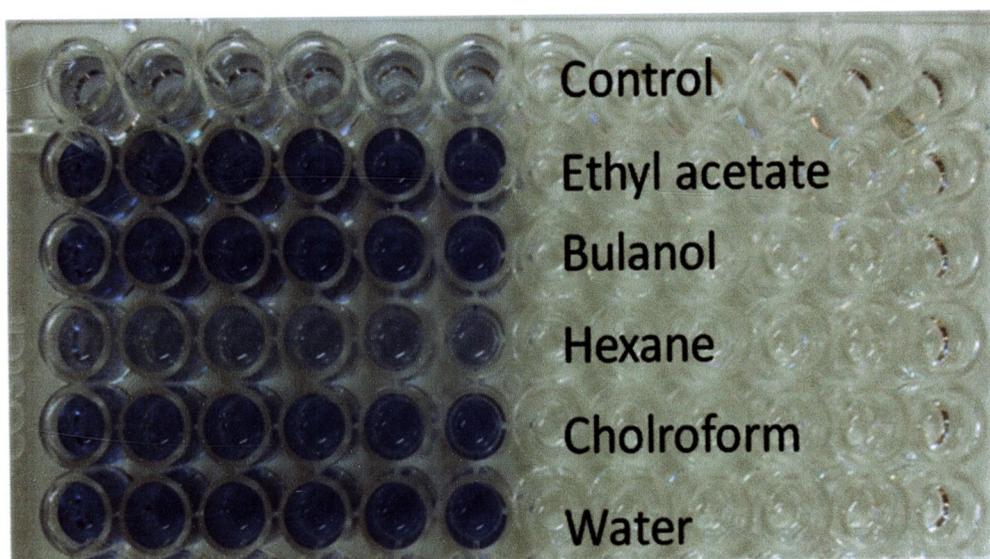


Figure 38 Antioxidant activity test via FRAP method

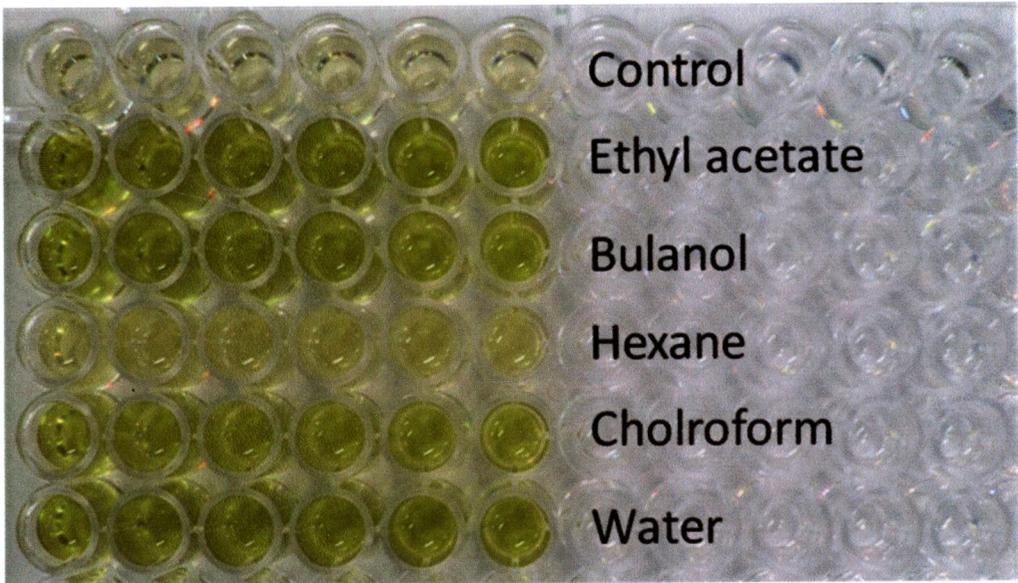


Figure 39 The total phenolic content assay of *P. emblica* fractional extract

APPENDIX C

Dosage calculation of PEF tablet

The dose of PEF tablet was calculated equivalent to the antioxidant activity of the usual daily dose of vitamin E (α -tocopherol) via DPPH method. The vitamin E dose that is not harmful and used for dietary supplement is 400-1000 IU (international unit) or 266.7-666.7 mg per day.

Calculation dose of vitamin E in term of mg unit:

$$9 \text{ IU} = 6 \text{ mg}$$

$$400 \text{ IU} = \frac{(400 \times 6)}{9} = 266.67 \text{ mg}$$

$$1000 \text{ IU} = \frac{(1000 \times 6)}{9} = 666.67 \text{ mg}$$

PEF had antioxidant activity via DPPH method greater than that of standard α -tocopherol. The IC_{50} ratio of α -tocopherol per PEF was 1.49 times. The dose of ethyl acetate fractional extract can be calculated using the following equation.

Calculation the dose of *P. emblica* ethyl acetate fractional extract

$$\begin{aligned} \frac{\text{Dose of PEF}}{\text{Dose of vitamin E}} &= \frac{1}{1.49} \\ \text{Dose of PEF} &= \frac{\text{Dose of vitamin E}}{1.49} \\ &= \frac{266.67 \text{ mg}}{1.49} = 178.97 \text{ mg} \\ &= \frac{666.67 \text{ mg}}{1.49} = 447.43 \text{ mg} \end{aligned}$$

The dose of PEF use in the tablet was in the range of 178.97 - 447.43 mg. We selected the dose of 250 mg PEF in the formula.

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- Okonogi S, Japanya K, Hongwiset D, Yotsawimonwat S. Fractionation of *Phyllanthus emblica* extract for encapsulated products. XVIII International Conference on Bioencapsulation. October 1-2, 2010: Porto, Portugal.
- Oral Presentation** Japanya K, Okonogi S, Yotsawimonwat S. Antioxidant and Antiglycation Activities of *Phyllanthus emblica* Lin. Fractional Extracts. The 2nd CMU Graduate Research

Conference, November 26, 2010: Chiang Mai University, Chiang Mai, Thailand.

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