

CHAPTER II

OBJECTIVES

General objective

To investigate pandan leaves on potential anti-Alzheimer properties through controlling of termination of physiological role of cholinergic synapses, β -amyloid formation and oxidative stress induction.

Specific objectives

Thus, the aims of the research were as follows.

1. To optimize extraction conditions for high recovery yield of bioactive compounds with antioxidant activities and anticholinesterase properties from pandan leaves using response surface methodology.

2. To study the biochemical properties of pandan leaves extract against AD through hypotheses of oxidative stress induction, cholinergic pathway and β -amyloid formation. The first hypothesis was focused on total phenolic contents and antioxidant activities. The second hypothesis included two cholinesterase enzymes, acetylcholinesterase and butyrylcholinesterase, while the last hypothesis was involved beta-secretase.

3. To study and compare antioxidant activities and anti-AD properties of pandan leaves with different particle sizes and cultivated locations (6 regions of Thailand including Central, Northeast, North, South, East and West regions).

4. To characterize bioactive compounds or phytochemicals in pandan leaves using gas chromatography-mass spectrometry and high performance liquid chromatography.

5. To study antioxidants and anticholinesterase activities in tea and juice from pandan leaves.

Expected results and benefits

The results obtained from present study would provide information as follows:

1. Biological properties against AD of pandan leaves in cholinergic hypothesis, β -amyloid formation and oxidative stress induction.
2. The effect of extraction conditions, including extraction time, extraction solvent, extraction temperature and solid-to-liquid ratio on recovery yield of bioactive compounds with anti-AD properties.
3. The effect of different particle sizes and cultivated locations of pandan leaves regarding antioxidant and anti-AD properties.
4. Potential bioactive compounds with antioxidant and anticholinesterase properties in pandan leaves. The effect of different processing of pandan leaves juice and pandan leaves tea toward antioxidant activities and anti-AD properties.

The information from this study including of total phenolic contents, antioxidant capacities, cholinesterase inhibitory activities, beta-secretase inhibitory activity and phytochemicals would be beneficial for promoting pandan leaves as natural products for potential prevention of AD. This study could be a model for extraction system of bioactive compounds for other plants. Nevertheless, this knowledge would sustain the consumption of pandan leaves as functional food or healthy drink in the future.