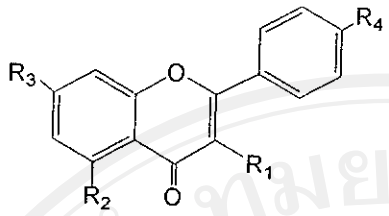
CHAPTER V

CONCLUSION

Kaempferia parviflora Wall. ex Baker has been used as traditional medicines for the treatment of colic disorder, peptic ulcer, duodenal ulcer, gastrointestinal disorders, cardiotonic and aphrodisiac. 5,7-Dimethoxyflavone has been reported as the strong antiinflame agent (8-9,13) in this plant. Although the chemical constituents in non-polar fraction of this plant and their anti-inflammatory activity have been presented, no isolation of active principle(s) has been reported up to date on antioxidant. In this present investigation, the active fraction of alcohol extract and five known flavones were isolated and tested for their antioxidant activity. Five known flavones (as shown below) were found in *n*-hexane and ethyl acetate extracts. The identification of the isolated compounds was carried out based on the physical and spectroscopic properties and confirmed by comparison with the published data in literatures (4, 7).



Code	Compounds	R_1	R_2	R_3	R_4
KP1-002P	5-hydroxy-3,7-dimethoxyflavone	OMe	OH	OMe	H
KP1-004-5P					
KP1-010P					
KP1-005-2P	5-hydroxy-7,4'-	H	OH	OMe	OMe
KP1-007-6P	dimethoxyflavone				
KP1-006-5P	5-hydroxy-7-methoxyflavone	H	OH	OMe	H
KP2-007-2-02P					
KP1-012P	3,5,7-trimethoxyflavone	OMe	OMe	OMe	H
KP2-007-1P					
KP2-005P	5,7-dimethoxyflavone	H	OMe	OMe	H
KP2-006-2P					

In this work, free radical scavenging ($ABTS^{0+}$ Assay) and ferric reducing ability power assay (FRAP Assay) were used to assessment antioxidant activity of crude extracts and their isolated compounds. The results revealed that antioxidant of crude extracts determined by FRAP assay are proportional to $ABTS^{0+}$ assay. Both assay revealed that methanol extract displayed the highest antioxidant activity in both assays. These results may due to compounds in this fraction may contain several –OH or electron-donating groups in their molecules (21, 23, 41).

Comparisons antioxidant activity of isolated compounds found that unidentified fraction (KP3-005-2-02P) from methanol extract displayed the highest antioxidant activity in both assay. While 5-hydroxy-7-methoxyflavone gave the highest free radical scavenging activity (0.516 mg ascorbic acid/g sample) and 5-hydroxy-3,7-dimethoxyflavone gave the highest reducing ability power (380.75 mg Fe_2SO_4/g sample). However, antioxidant activity of some isolated compounds evaluated by FRAP assay are not relate with $ABTS^{0+}$ assay. Compounds with high free radical scavenging activity did not always have high reducing power due to they contained different structures. As refer in chapter II, the structure of flavonoids is a key determinant of their radical scavenging and reducing activity. Electron-donating groups are basically required for antioxidant assay. Antioxidant activity of flavonoid compounds determined by $ABTS^{0+}$ assay is based on their ability to donate electron to free radical. On the other hand, FRAP assay strongly depend on the configuration and total number of OH-groups in flavonoid molecules. *Ortho*-dihydroxy group, especially 3',4'-catechol is required for metal ion reducing. Beside that, 3-or 5-OH moiety may also contribute to the reducing of metal ion. Based on these data, all of isolated compounds showed comparatively low antioxidant activity in both assays due to they contain a few of electron-donating groups or –OH group in their molecules.

The obtained results indicated that the antioxidant activity of flavonoids is due to their ability to scavenge free radicals, donate hydrogen atoms or electrons, or reduce metal ions. The structure of flavonoids is a key determinant of their radical scavenging and reduce reactive species, and this is referred to as structure-activity relationships (SAR).

Moreover, the investigation of chemical constituents from methanol extract which showed comparatively high antioxidant activity are continued to be undertaken using chromatography techniques.

From the obtained results, it may be concluded that antioxidant activity of flavonoids largely depend on the assays used and their molecular structures.