

## CHAPTER IV

### CONCLUSION

The dry stems of *Piper aurantiacum* Miq. were investigated for their chemical constituents by solvent extraction to afford methanol crude extract and re-extraction of this crude gave hexane, chloroform, ethyl acetate, n-butanol and methanol crude extract, respectively. After isolation by chromatographic separation, they were purified and 5 compounds were obtained and characterized for their structures by chemical reaction, physical properties and spectroscopic data. In summary, there are 4 organic substances and an 1 inorganic salt as presented in Table 4.1.

**Table 4.1** : Chemical constituents of the stem of *Piper auratiacum* Miq.

No.	Name	Crude extract	Wt. (g)	% wt. by wt. of dried stems
I	$\beta$ -sitosterol	hexane	0.99	0.01
II	methyl-5-(3', 4'-methylene dioxypheyl)penta-2,4-dienoate (methyl piperate)	hexane and chloroform	1.09	0.02
III	endo,-1,7,7-trimethyl bicyclo [2, 2, 1] heptan-2-ol-3'-(4'-hydroxyphenyl)-2'-propenoate (borneol p-coumarate)	hexane, chloroform and ethyl acetate	8.74	0.42
IV	1,3-benzodioxole-5-carboxylic acid	hexane	trace	-
V	potassium chloride	methanol	0.04	$1.37 \times 10^{-3}$

From the literature search it was found that although borneol p-coumarate was isolated from the other Piper species such as *Piper ribesoides* [43,44] ; it was the first time that this compound was investigated from *Piper aurantiacum* Miq. And the structure of isoborneol p-coumarate, the new compound from natural sources, from *Piper ribesoides* Wall. [61] was corrected.

Further studies should be an X-ray crystallography experiment both of borneol p-coumarate and isoborneol p-coumarate to afford their absolute structures. Further investigation for more chemical constituents and their bioactivities from *Piper aurantiacum* Miq. is also encouraged.