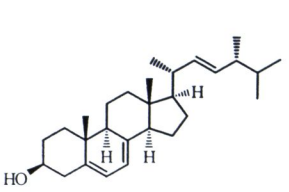
CHAPTER IV
CONCLUSIONS

Sequentially extraction of air-dried mycelial mat of *C. elatum* (210 g) and *C. lucknowense* (282 g) with hexane, EtOAc and MeOH gave six crude extracts. The crude hexane 8.4 g (4.00%), crude EtOAc 21.7 g (10.33%) and crude MeOH 28.5 g (13.57%) were derived from *C. elatum* while the crude hexane 8.4 g (2.98%), crude EtOAc 18.0 g (6.38%), and crude MeOH 45.3 g (16.06%) were obtained from *C. lucknowense*.

Chromatographic separation of crude extracts from *C. elatum* gave twelve compounds **I-XI** and **XIX**. Among these, they were two steroids **I** and **II**, nine 10-(indol-3-yl)-[13]cytochalasans **III-XI,** and a sugar **XIX.** The isolation of crude extracts from *C. lucknowense* yielded ten compounds consisting of **I-II** and **XII-XIX**. They were two steroids **I** and **II**, two hydroxyanthraquinones **XII** and **XIII**, an azaphilone **XIV**, a bis-spiro-azaphilones **XV**, three xanthoquinodins **XVI-XVIII**, and a sugar **XIX**. Their structures were elucidated on the basis of spectroscopic evidences (UV, IR, MS, ^{1}H NMR, ^{13}C NMR, DEPT and 2D NMR) as ergosterol (**I**), ergosterol peroxide (**II**), chaetoglobosin C (**III**), isochaetoglobosin D (**IV**), chaetoglobosin F (**V**), chaetoglobosin G (**VI**), chaetoglobosin B (**VII**), chaetoglobosin D (**VIII**), prochaetoglobosin III (**IX**), prochaetoglobosin IIIed (**X**), chaetoglobosin V (**XI**), chrysophanol (**XII**), emodin (**XIII**), chaetoviridin A (**XIV**), cochliodone D (**XV**), xanthoquinodin A1 (**XVI**), xanthoquinodin B2 (**XVII**), compound **XVIII**, and D-mannitol (**XIX**). The structures of isolated compounds from *C. elatum* and *C. lucknowense* are shown in Figures 4.1 and 4.2, respectively and their amount is summarized in Table 4.1. Among the known isolated compounds, **I**, **II**, and **XIX** were produced from both fungi. In addition, this is the first report for the isolation of cytochalasan and xanthoquinodin analogs from *C. elatum* and *C. lucknowense*, respectively. According to the SciFinder Scholar database 2010, two compounds **XI** from *C. elatum* and **XVIII** from *C. lucknowense* were new compounds together with two compounds **IX** and **X** from *C. elatum* were new natural products.

The results of bioactivity assays of these isolated compounds revealed that compounds **XI**, **XVI**, **XVII** and **XVIII** displayed antimalarial activity against *P. falciparum*, anti-TB activity against *M. tuberculosis*, and cytotoxicity against NCI-H187, KB, and BC1 cancer cell lines. Compounds **III-XI** were tested and the result showed that most of them cytotoxic against both BC1 cell lines and cholangiocarcinoma cultured cell lines. In conclusion, the nineteen compounds were isolated from *C. elatum* and *C. lucknowense* four were new compounds, **IX**, **X**, **XI** and **XVIII**, together with fifteen known compounds. Finally, the finding of this study should provide some interesting topics for researchers in related fields. Research such as biosynthesis, bioactivity mechanism, toxicology, and the development of the utility of these bioactive compounds should be studied.



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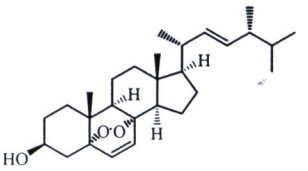

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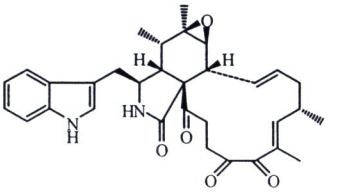

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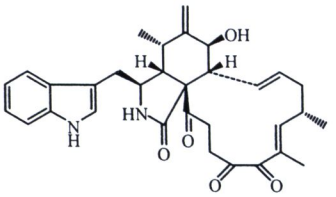

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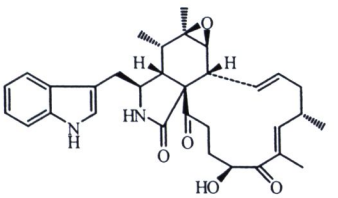

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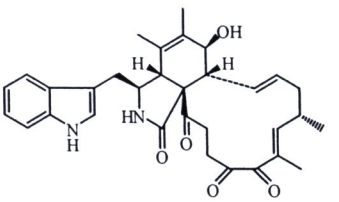

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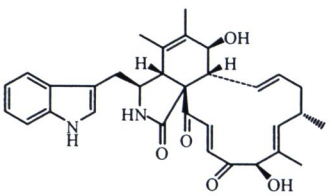

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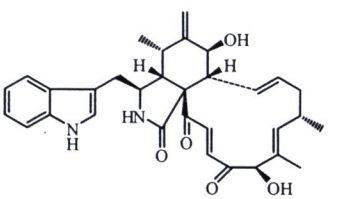
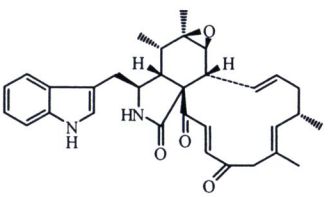


VIII



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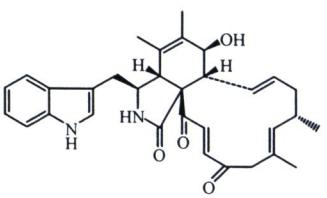
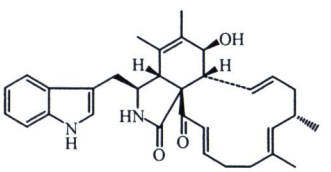
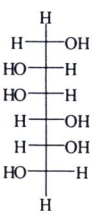


X



XI



XIX

Figure 4.1 The structure of isolated compounds from *C. elatum*.

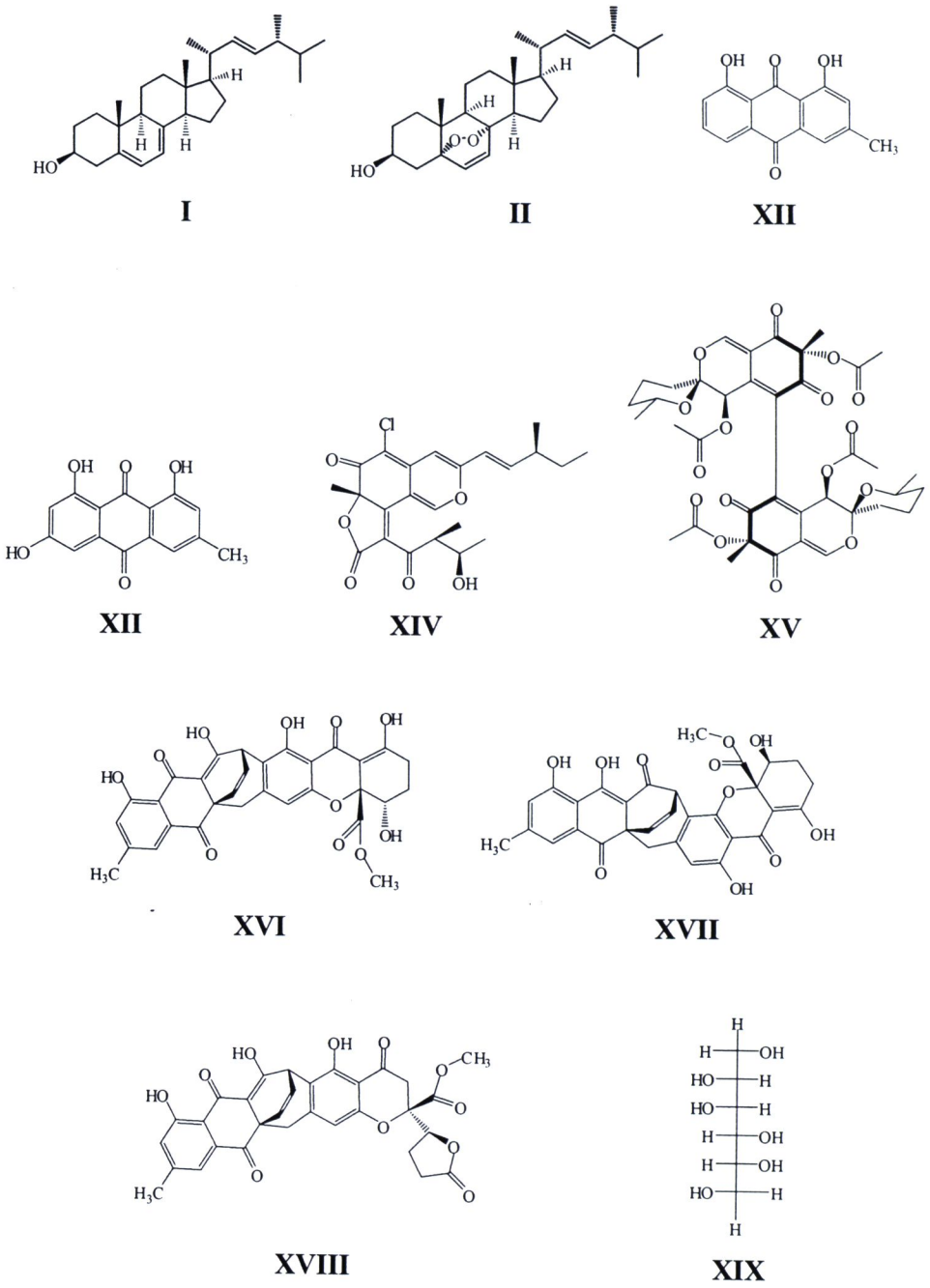


Figure 4.2 The structure of isolated compounds from *C. lucknowense*.

Table 4.1 The amount and biological activities of the isolated compounds (**I-XIX**) from *C. elatum* and *C. lucknowense*

Compound	Weight (mg)		Antimalarial, IC_{50} (μg/mL)	Anti-TB, MIC (μg/mL)	Cytotoxicity, IC_{50} (μg/mL)				
	C. elatum	*C. lucknowense*			NCI-H187[a]	KB[b]	BC1[c]	KKU-100[d]	KKU-OCA17[e]
I	370.1	47.6	nd[f]	nd	nd	nd	nd	nd	nd
II	52.1	86.0	nd	nd	nd	nd	nd	nd	nd
III	4123.4		nd	nd	nd	nd	3.27	inactive[g]	15.6
IV	67.1		nd	nd	nd	nd	2.88	3.9	44.9
V	19.6		nd	nd	nd	nd	10.55	22.4	46.8
VI	9.3		nd	nd	nd	nd	5.50	15.7	inactive
VII	204.2		nd	nd	nd	nd	1.55	36.9	30.5
VIII	43.8		nd	nd	nd	nd	3.83	1.8	6.4
IX	21.0		nd	nd	nd	nd	10.96	43.9	26.6
X	43.4		nd	nd	nd	nd	1.29	inactive	inactive
XI	10.9		2.40	50	11.57	2.28	2.59	43.3	26.5
XII		193.9	nd	nd	nd	nd	nd	nd	nd
XIII		54.6	nd	nd	nd	nd	nd	nd	nd
XIV		137.0	inactive	inactive	inactive	inactive	inactive	nd	nd
XV		188.3	inactive	inactive	inactive	inactive	inactive	nd	nd
XVI		705.0	1.43	12.50	0.456	2.77	10.64	nd	nd
XVII		30.0	1.70	25.00	1.03	4.01	25.23	nd	nd
XVIII		479.5	3.2	25	inactive	9.6	9.8	nd	nd
XIX	1247.3	729.3	nd	nd	nd	nd	nd	nd	nd
artemisinin			0.001						
isoniazid				0.05					
kanamycin sulfate				2.5					
ellipticine					0.32	0.36	0.26		
5-fluorouracil (5-FU)								45.3	0.3

[a]Human lung cancer cells,

[b]Human epidermoid carcinoma in the mouth,

[c]Human breast cancer cells,

[d]Poorly differentiated adenocarcinoma,

[e]Well differentiated adenocarcinoma,

[f]nd = not determined,

[g]inactive at > 50 μg/mL