CHAPTER V

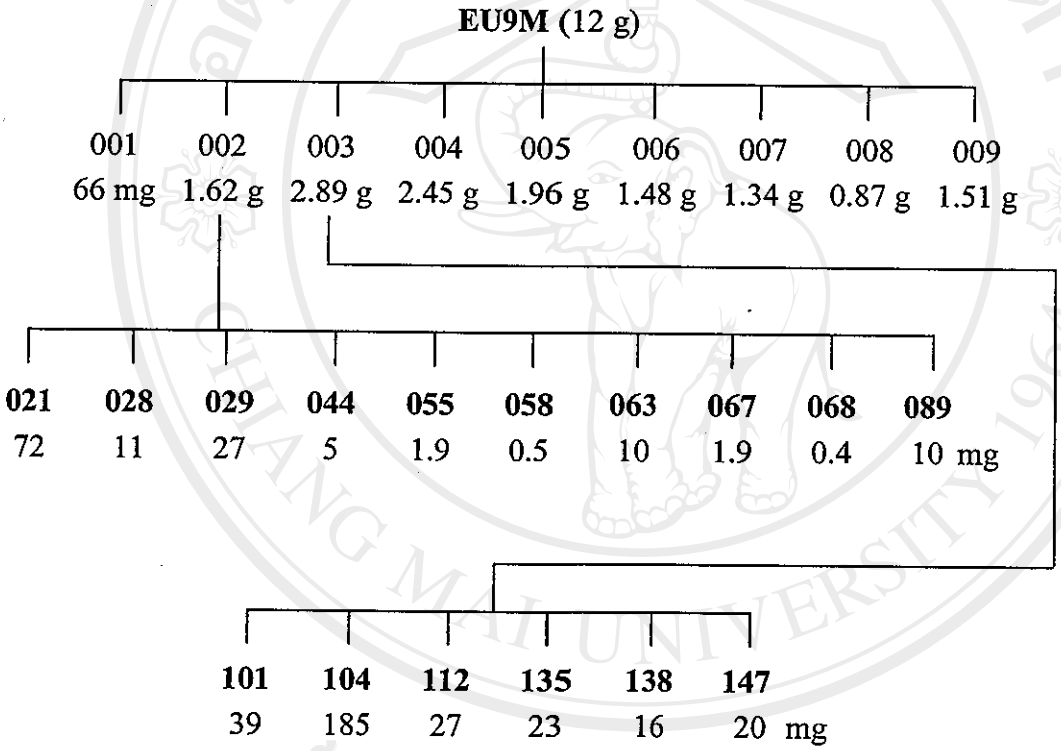
CONCLUSION

Chromolaena odorata has been used as a component of traditional medicines for several indications in a number of countries, however little scientific evidence has supported these traditional uses. Preliminary bioassays in this work revealed that the extracts from this plant showed interesting biological activities including antibacterial, antituberculosis, anti-HSV-1 and antimalarial activities. Some bioassay results, notably the antimalarial and antibacterial activities, are supportive the traditional usage. Fractionation of active fraction EU9M afforded fifteen flavonoids, of which one was a new compound whose structure was elucidated as 5,7-dihydroxy-6,4′-dimethoxyflavanone (EU9M044). Six of the other flavanoids have been isolated from this plant for the first time including 5-hydroxy-7,4′-dimethoxyflavone (EU9M058), 5-hydroxy-6,7,4′-trimethoxyflavanone (EU9M067), 5-hydroxy-7,3′,4′-trimethoxyflavanone (EU9M068), 3,5,4′-trihydroxy-7-methoxy-flavanone (EU9M135), 5,7,3′-trihydroxy-5′-methoxyflavanone (EU9M138) and 3,5, 7-trihydroxy-4′methoxyflavanone (EU9M147). All of the isolated compounds were fractionated from a less active fraction and a major component, EU9M104K, did not show activity against HSV-1 at the concentration of 50 μg/ml. The chemical investigation for active principles from more polar fractions which exhibited activity against HSV-1 are continuing to be undertaken using bioassay-directed fractionation but time constraints prevented their completion for this thesis. An active antimalarial fraction EU10C713 from the dichloromethane root extract was also identified.

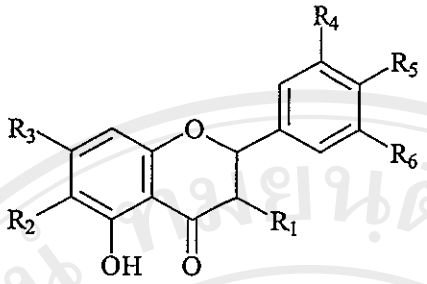
The chemical composition of the essential oil from the aerial parts of *C. odorata*, collected from Phitsanulok, Thailand was analyzed by means of GC-(FID) and GC-MS. Twenty-two constituents were identified. The major components were pregeijerene (17.6%), germacrene D (11.1%), α-pinene (8.4%), β-caryophyllene (7.3%), vestitenone (6.5%), β- pinene (5.6%), δ-cadinene (4.9%), geijerene (3.1%),

bulnesol (2.9%), and *trans*-ocimene (2.2%). Eight compounds, 2,3-dihydro-4-methylfuran, 2-hexenal, 1,2,3,6-tetramethyl-bicyclo-[2.2.2]octa-2,5-diene, mellitene, vestitenone, 4-ethenyl-α,α,4-trimethyl-3-(1-methylethenyl)-[1*S*-(1α,3α,4α)]-cyclohexane methanol, epi-α-cadinol and bulnesol, had not been reported previously in the essential oil of this plant.

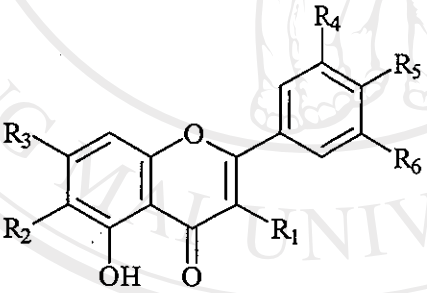
The isolation scheme of the flavonoids isolated from fraction EU9M



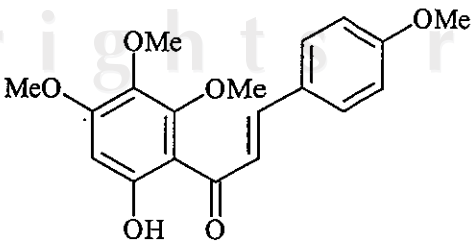
The structures of the isolated compounds



EU9M	R_1	R_2	R_3	R_4	R_5	R_6
044	H	OMe	OH	H	OMe	H
067	H	OMe	OMe	H	OMe	H
021	H	H	OH	H	OMe	H
028	H	H	OMe	H	OMe	H
104	H	H	OMe	OH	OMe	H
068	H	H	OMe	OMe	OMe	H
089	H	H	OMe	H	OH	H
138	H	H	OH	OH	H	OMe
055	OH	H	OMe	H	OMe	H
135	OH	H	OMe	H	OH	H
147	OH	H	OH	H	OMe	H



EU9M	R_1	R_2	R_3	R_4	R_5	R_6
058	H	H	OMe	H	OMe	H
112	H	H	OH	H	OMe	H
101	OH	H	OMe	OH	OMe	H



EU9M029

The conclusion table of the fractions isolated from the aerial and subterranean parts of *C. odorata* and their biological activities

Fractions	Amount (g)	Part use		Solvent of partition					Bioassay results				
		Leaf	Root	Hexane	DCM	MeOH	BuOH	Water	Anti-HSV-1 (IC_{50}, µg/ml)	Anti-TB (MIC, µg/ml)	Antimalarial (EC_{50}, µg/ml)	Anti-inflam.	Cytotoxicity
EU9C	-	/			/				1.74	100	Inactive	Inactive	Inactive
EU9B	38	/					/		27.04	Inactive	Inactive	active	Inactive
EU9W	384	/						/	Inactive	Inactive	Inactive	Inactive	Inactive
EU9H	87	/		/					34.50	Inactive	nt	nt	Inactive
EU9M	105	/				/			2.75	200	nt	nt	Inactive
EU10C	19		/		/				Moderately Active	200	9.39	Inactive	Inactive
EU10B	26		/				/		Inactive	Inactive	Inactive	Inactive	Inactive
EU10W	182		/					/	Inactive	Inactive	Inactive	Inactive	Inactive

The conclusion table of the fractions isolated from the subterranean parts of *C. odorata* and their antimalarial activity

Fractions	Amount	From fraction	Antimalarial activity (EC_{50} ; µg/ml)
EU10C001	420 mg	EU10C	32.5
EU10C002	40 mg	EU10C	not test
EU10C003	100 mg	EU10C	inactive
EU10C004	1.4 g	EU10C	inactive
EU10C005	-	EU10C	inactive
EU10C006	320 mg	EU10C	11.8
EU10C007	2.6 g	EU10C	2.93
EU10C008	1.1 g	EU10C	6.9
EU10C009	1.7 g	EU10C	inactive
EU10C010	390 mg	EU10C	inactive
EU10C701	90 mg	EU10C007	inactive
EU10C702	60 mg	EU10C007	inactive
EU10C703	655 mg	EU10C007	inactive
EU10C704	70 mg	EU10C007	inactive
EU10C705	179 mg	EU10C007	inactive
EU10C706	64 mg	EU10C007	6.6
EU10C707	35 mg	EU10C007	6.3
EU10C708	62 mg	EU10C007	5.9
EU10C709	53 mg	EU10C007	6.2
EU10C710	64 mg	EU10C007	3.5
EU10C711	130 mg	EU10C007	3.4
EU10C712	156 mg	EU10C007	2.7
EU10C713	266 mg	EU10C007	1.9
EU10C714	92 mg	EU10C007	2.8
EU10C715	96 mg	EU10C007	3.2
EU10C716	117 mg	EU10C007	3.1
EU10C717	32 mg	EU10C007	inactive