REFERENCES

Ahmed, M., Islam, M.M., Hossain, C.F., and Khan, O.F. 2001. A preliminary study on analgesic activity of *Grangea maderaspatana*. Fitoterapia 72: 553-554.

Amresh, G., Kant, R., Rao, Ch.V., and Singh, P.N. 2007. Chemomodulatory influence of *Cissampelos pareira* (L.) Hirsuta on gastric cancer and antioxidant system in experimental animal. Acta Pharmaceutica Sciencia 49: 71-83.

Angerhofer, C.K., Guinaudeau, H., Wongpanich, V., Pezzuto, J.M., and Cordell, G.A. 1999. Antiplasmodial and cytotoxic activity of natural bisbenzylisoquinoline alkaloids. Journal of Natural Products 62: 59-66.

Bates, A.D., and Maxwell, A. 2005. DNA topoisomerases. 2nd ed. Oxford: Oxford University press.

Bjornsti, M.A., Benedetti, P., Viglianti, G.A., and Wang, J.C. 1898. Expression of human DNA topoisomerase I in yeast cell lacking yeast DNA topoisomerase I: restoration of sensitivity of the cells to the antitumor drug camptothecin. Cancer Research 49: 6318-6323.

Bjornsti, M.A., Knab, A.M., and Benedetti, P. 1994. Yeast *Saccharomyces cerevisiae* as a model system to study the cytotoxic activity of the antitumor drug camptothecin. Cancer Chemotheraphy and Pharmacology 34: S1-S5.

Brien, J.O., Wilson, I., Orton,T., and Pognon, F. 2000. Investigation of the alamar blue (resazurin) fluorescent dye for the assessment of mammalian cell cytotoxicity. European Journal of Biochemistry 267: 5421-5426.

Chattopadhyay, D., and Khan, M.T.H. 2008. Ethnomedicines and ethnomedicinal phytophores against herpesviruses. Biotechnology Annual Review 14: 297-348.

Dassonneville, L., Bonjean, K., Pauw-Gillet, M.D., Colson, P., Houssier, C., Quetin-Leclercq, J., Angenot, L., and Bailly, C. 1999. Stimulation of topoisomerase II-mediated DNA cleavage by three DNA-intercalating plant alkaloids: cryptolepine, matadine, and serpentine. Biochemistry 38: 7719-7726.

El-Karemy, Z.A.R., Mansour, R.M.A., Fayed, A.A., and Saleh, N.A.M. 1987. The flavonoids of local members of Astereae (Compositae). Biochemical Systematics and Ecology 15(1): 53-55.

Eng, W.K., Faucette, L., Johnson, R.K., and Sternglanz, R. 1988. Evidence that DNA topoisomerase I is necessary for the cytotoxic effects of camptothecin. Molecular Pharmacology 34: 755–760.

Fankhauser, D.B. 2005. Yeast plate count protocol[Online]. University of Cincinnati Clermont Cllege: Available from http:// biology.clc.uc.edu/Fankhauser/Labs/ Microbiology/Yeast Plate Count/yeast Plate Count.htm [2008, May 25]

Flick, J.S. and Johnston, M. 1990. Two systems of glucose repression of the *GAL1* promoter in *Saccharomyces cerevisiae*. Molecular and Cellular Biology 10(9): 4757-4769.

Forterre, P., Gribaldo, S., Gadelle, D., and Serre, M.C. 2007. Origin and evolution of DNA topoisomerase. Biochimie 89: 427-446.

González, R.D., Pertejo, Y.P., Redondo, C.M., Pommier, Y., Balaña-Fouce, R., and Reguera, R.M. 2007. Structural insights on the small subunit of DNA topoisomerase I from the unicellular parasite *Leishmania donovani*. Biochimie 89: 1517-1527.

Guevara, A.P., Vargas, C., Sakurai, H., Fujiwara, Y., Hashimoto, K., Maoka, T., Kozuka, M., Ito, Y., Tokuda, H., and Nishino, H. 1999. An antitumor promoter from *Moringa oleifera* Lam. Mutation Research 440: 181-188.

http://www.biotik.org/india/species/a/artogoze/artogoze_02_en.html [2009, August 18]

http://www.discoverlife.org/mp/20p?see=I_PAO126&res=640 [2009, August 18]

Huang, S.T., Yang, R.C., Lee, P.N., Yang, S.H., Liao, S.K., Chen, T.Y., and Pang, J.H.S. 2006. Anti-tumor and anti-angiogenic effects of *Phyllanthus urinaria* in mice bearing Lewis lung carcinoma. International Immunopharmacology 6: 870-879.

Itharat, A. and Ooraikul, B. 2007. Research on Thai medicinal plants for cancer treatment. In Acharya, S.N., and Thomas, J.E. (eds.), Advances in medicinal plant research, 287-317. Keraia: Research Signpost.

Iyer, C.S.R., and Iyer, P.R. 1978. Steroids from *Grangea madaeraspatana*. Phytochemistry 17: 2036-2037.

Johnson, J.J., and Mukhtar, H. 2007. Mini-review curcumin for chemoprevention of colon cancer. Cancer Letters 255: 170-181.

Kasiwong, S. 1988. Sesquiterpene lactones from *Michelia rajaniana* stem brak and *Grangea madaeraspatana*. Master's Thesis. Department of Pharmacognosy, Graduate School, Chulalongkorn University.

Kieber, J.J., Tissier, A.F., and Signer, E.R., 1992. Cloning and characterization of an *Arabidopsis thaliana* topoisomerase I gene. Plant Physiology 99: 1493–1501.

Krishna, V., and Singh, P. 1999. A clerodane derivative from *Grangea madaeraspatana*. Phytochemistry 52: 1341-1343.

Lorence, A., and Nessler, C.L. 2004. Molecules of interest camptothecin, over four decades of surprising findings. Phytochemistry 65: 2735-2749.

Lu, N., Yang, Y., You, Q.D., Ling, Y., Gao, Y., Gu, H.Y., Zhao, L., Wang, X.T., and Guo, Q.L. 2007. Gambogic acid inhibits angiogenesis through suppressing vascular endothelial growth factor-induced tyrosine phosphorylation of KDR/Flk-1. Cancer Letters 258: 80-89.

Makarasen, A. 2004. Chemical constituents and their biological activities from *Stephania suberosa* Forman. Master thesis, Kasetsart University, Bangkok.

Matsuda, H., Ninomiya, K., Morikawa, T., and Yoshikawa, M. 1998. Inhibitory and action mechanism of sesquiterpenes from zedoariae rhizome on d-galactosamine / lipopolysaccharide-induced liver injury. Bioorganic & Medicinal Chemistry Letters 8: 339-344.

National Statistical Office of Thailand. 2003. Key Statistics of Thailand 2003. Ministry of Information and Communication Technology, Bangkok.

Nitiss, J., and Wang, J. 1988. DNA topoisomerase-targeting antitumor drugs can be studied in yeast. Proceedings of the National Academy of Sciences. United States of America 88: 7501-7505.

Numchaisermsuk, N., and Cherdshewasart, W. 2008. Evaluating the estrogenic activity of the Thai rejuvenating medicinal plants: *Ziziphus attopensis* Pierre, *Phyllanthus emblica* Linn. and *Melia azedarach* Linn. with the MCF-7 cell line. The Science Forum: 38.

Osheroff, N. 1998. Preface DNA topoisomerases. Biochimica et Biophysica Acta 1400: 1-2.

Osheroff, N., and Bjornsti, M.A. 2001. DNA topoisomerase protocols enzymology and drugs. United States of America: Humana Press.

Pandey, U.C., Singhal, A.K., Barua, N.C., Sharma, R.P., Baruah, J.N., Watanabe, K., Kulanthaivel, P., and Herz, W. 1984. Stereochemistry of strictic acid and related furanoditerpenes from *Conyza japonica* and *Grangea madaeraspatana*. Phytochemistry 23(2): 391-397.

Pettit, G.R., Numata, A., Cragg, G.M., Herald, D.L., Takada, T., Iwamoto, C., Riesen, R., Schmidt, J.M., Doubek, D.L., and Goswami, A. 2000. Isolation and structures of schleicherastatins 1-7 and schleicheols 1 and 2 from the teak forest medicinal tree *Schleichera oleosa*. Journal of Natural Products 63: 72-78.

Pillai, G.R., Srivastava, A.S., Hassanein, T.I., Chauhan, D.P., and Carrier, E. 2004. Induction of apoptosis in human lung cancer cells by curcumin. Cancer Letters 208: 163-170.

Pinmai, K., Chunlaratthanabhorn, S., Ngamkitidechakul, C., Soonthornchareon, N., and Hahnvajanawong, C. 2008. Synergistic growth inhibitory effects of *Phyllanthus emblica* and *Terminalia bellerica* extracts with conventional cytotoxic agents: doxorubicin and cisplatin against human hepatocellular carcinoma and lung cancer cells. World Journal of Gastroenterology 14: 1491-1497.

Pommier, Y. 1998. Diversity of DNA topoisomerase I and inhibitors. Biochimie 80: 255-270.

Pommier, Y. 2009. DNA topoisomerase I inhibitors: chemistry, biology, and interfacial inhibitor. Chemical Reviews 109: 2894-2902.

Pommier, Y., Pourquoer, P., Fan, Y., and Strumberg, D. 1998. Mechanism of action of eukaryotic DNA topoisomerase I and drugs targeted to the enzyme. Biochimica et Biophysica Acta 1400: 83-105.

Potier, P. 1980. Synthesis of the antitumor dimeric indole alkaloids from *Catharanthus* species (vinblastine group). Journal of Natural Products 43(1): 722-86.

Pourquier, P. and Pommier, Y. 2001. Topoisomerase I-mediated DNA damage. Advances in Cancer Research 80: 189-216.

Pramyothin, P., Janthasoot, W., Pongnimitprasert, N., Phrukudom, S., and Ruangrungsi, N. 2004. Hepatotoxic effect of (+) usnic acid from *Usnea siamensis* Wainio in rats, isolated rat hepatocytes and isolated rat liver mitrochondria. Journal of Ethnopharmacology 90: 381-387.

Punturee, K., Wild, C.P., and Vinitketkumneun, U. 2004. Thai medicinal plants modulate nitric oxide and tumor necrosis factor-α in J774.2 mouse macrophages. Journal of Ethnopharmacology 95: 183-189.

Rahman, A.H.M.M., Alam, M.S., Khan, S.K., Ahmed, F., Islam, A.K.M.R., and Rahman, M.M. 2008. Taxonomic studies on the family Asteraceae (Compositae) of the Rajshahi division. Research Journal of Agriculture and Biological Science 4(2): 134-140.

Rajeshkumar, N.V., Joy, K.L., Kuttan, G., Ramsewak, R.S., Nair, M.G., and Kuttan, R. 2002. Antitumour and anticarcinogenic activity of *Phyllanthus amarus extract.* Journal of Ethnopharmacology 81: 17-22.

Ramesh, N., Viswanathan, M.B., Saraswathy, A., Balakrishna, K., Brindha, P., and Lakshmanaperumalsamy, P. 2001. Phytochemical and antimicrobial studies on *Drynaria quercifolia.* Fitoterapia 72: 934-936.

Reid, R.J.D., Benedetti, P., and Bjornsti, M.A. 1998. Yeast as a model organism for studying the actions of DNA topoisomerae-targeted drugs. Biochimica et Biophysica Acta 1400: 289-300.

Roca, J. 1995. The mechanism of DNA topoisomerases. Trends in Biochemical Sciences 20: 156-160.

Rojatkar, S.R., Chiplunkar, Y.G., and Nagasampagi, B.A. 1994. A diterpene from fruticosa and *Grangea maderaspatana*. Phytochemistry 37(4): 1213-1214.

Roth, G.N., Chandra, A., and Nair, M.G. 1998. Novel bioactivities of *Curcuma longa* constituents. Journal of Natural Products 61: 542-545

Ruangrungsi, N., Kasiwong, S., Likhitwitayawuid, K., Lange, G.L., and Decicco, C.P. 1989. Constituents of *Grangea maderaspatana*. Journal of Natural Products 52(1): 130-134.

Saetung, A., Itharat, A., Dechsukum, C., Wattanapiromsakul, C., Keawpradub, N., and Ratanasuwan, P. 2005. Cytotoxic activity of Thai medicinal plants for cancer treatment. Songklanakarin Journal Science Technology 27(2): 469-478.

Saleem, A., Husheem, M., Harkonen, P., and Pihlaja, K. 2002. Inhibition of cancer cell growth by crude extract and the phenolics of *Terminalia chebula* retz. fruit. Journal of Ethnopharmacology 81: 327-336.

Salguero, C.P. 2003. A Thai herbal traditional recipes for health and harmony. Finland: Findhorn Press.

Singh, P., Jain, S., and Jakupovic, J. 1988. Clerodane derivatives from *Grangea madaeraspatana*. Phytochemistry 27(5): 1537-1539.

Siripong, P., Yahuafai, J., Shimizu, K., Ichikawa, K., Yonezawa, S., Asai, T., Kanokmedakul, K., Ruchirawat, S., and Oku, N. 2006a. Induction of apoptosis in tumor cells by three naphthoquinone esters isolated from Thai medicinal plant: *Rhinacanthus nasutus* Kurz. Biological & Pharmaceutical Bulletin 29(10): 2070-2076.

Siripong, P., Yahuafai, J., Shimizu, K., Ichikawa, K., Yonezawa, S., Asai, T., Kanokmedakul, K., Ruchirawat, S., and Oku, N. 2006b. Antitumor activity of liposomal naphthoduinone esters isolated from Thai medicinal plant: Rhinacanthus nasutus Kurz. Biological & Pharmaceutical Bulletin 29(11): 2279-2283.

Smitinand, T. 2001. Thai plant names revised edition 2001. The Forest Herbarium, Royal Forest Department.

Strumberg, D., Pilon, A.A., Smith, M., Hickey, R., Malkas, L., and Pommier, Y. 2000. Conversion of topoisomerase I cleavage complexes on the leading strand of

ribosomal DNA into 5′-phosphorylated DNA double-strand breaks by replication runoff. Molecular and. Cellular Biology 20: 3977-3987.

Subchareon, P. 1998. Handbook of anticancer: Thai traditional medicine: new concept for treated cancer. Bangkok: Thai traditional medicine Institute.

Sukpondma, Y., Rukachaisirikul, V., and Phongpaichit, S. 2005. Antibacterial caged-tetraprenylated xanthones from the fruits of *Garcinia hanburyi*. Chemical & Pharmaceutical Bulletin 53(7): 850-852.

Temkitthawon, P., Viyoch, J., Limpeanchob, N., Pongamornkul, W., Sirikul, C., Kumpila, A., Suwanborirux, K., and Ingkaninan, K. 2008. Screening for phosphodiesterase inhibitory activity of Thai medicinal plants. Journal of Ethnopharmacology 119: 214-217.

The Information and Public Relations Office. 2008. Above 60,000 Thai patients died from cancer annually the major cause is lung cancer. The Ministry of Public Health of Thailand, 28 April 2008.

Wall, E.M., and Wani, M.C. 1996. Camptothecin and taxol: from discovery to clinic. Journal of Ethnopharmacology 51: 239-254.

Wall, M.E., Wani, M.C., Cook, C.E., Palmer, K.H., McPhail, A.T., and Sim, G.A. 1966. Plant antitumor agents. I. The isolation and structure of camptothecin, a novel alkaloidal leukemia and tumor. Journal of the American Chemical Society 88: 3888-3890.

Wang, J.C. 1996. DNA topoisomerases. Annual Review of Biochemistry 65: 635-692.

Wikipedia 2009. *Saccharomyces cerevisiae*[Online]. Available from http://en.wikipedia.org/wiki/Saccharomyces_cerevisiae [2009, August 1]

Wu, T.S., Tien, H.J., Yeh, M.Y., and Lee, K.H. 1988. Isolation and cytoyoxicity of rhinacanthin-a and –b, two naphthoquinones, from *Rhinacanthus nasutus*. Phytochemistry 27: 3787-3788.

Wuthi-udomlert, M., Luanratana, O., and Suriyawong, P. 2002. Agar diffusion test in antifungal activity screening of herbal extracts. Mahidol University Annual Research Abstracts 29: 183.

APPENDICES

Appendix A

1. YPD media (Difco™)

Broth formula

Formula per Liter

Yeast Extract	10.0 g
Peptone	20.0 g
Dextrose	20.0 g

Agar formula

Formula per Liter

Yeast Extract	10.0 g
Peptone	20.0 g
Dextrose	20.0 g
Agar	15.0 g

Media preparation

1. Suspend the powder in 1 L of purified water: Difco™ YPD Agar – 65 g; Difco™ YPD Broth – 50 g. Mix thoroughly.
2. Heat the agar medium with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave the agar and broth media at 121°C for 15 minutes.

2. **Synthetic complete media lacking uracil**

Agar formula for repressed system

Formula per Liter

Yeast nitrogen base (Difco Laboratories)	6.7 g
Amino acid mixtures lacking uracil (Sigma)	1.92 g
Bactro™ agar (Difco Laboratories)	20.0 g
Glucose (Difco Laboratories)	20.0 g

The composition of amino acid mixtures lacking uracil (Sigma)

Component	Product No.	Amount per liter of medium (mg)
Adenine hemisulfate	A 9126	18
Alanine	A 7627	76
Arginine hydrochloride	A 5131	76
Asparagine monohydrate	A 8381	76
Aspartic acid	A 9256	76
Cysteine hydrochloride monohydrate	C 7880	76
Glutamic acid monosodium salt	G 1626	76
Glutamine	G 3126	76
Glycine	G 7126	76
Histidine	H 8000	76
Myo-Inositol	I 5125	76
Isoleucine	I 2752	76
Leucine	L 8000	380
Lysine monohydrochloride	L 5626	76
Methionine	M 9625	76
p-Aminobenzoic acid potassium salt	A 0254	8
Phenylalanine	P 2126	76
Proline	P 0380	76
Serine	S 4500	76
Threonine	T 8625	76
Tryptophan	T 0254	76
Tyosine disodium salt	T 2269	76
Valine	V 0500	76

Media preparation

1. Suspend the powder in 1 L of purified water: 6.7 g of yeast nitrogen base and 1.92 g of amino acid mixtures lacking uracil. Mix thoroughly to completely dissolve the powder.
2. Adjusted media to pH 7.2 by 1N NaOH
3. Add 20 g of glucose and 20.0 g of Bactro™ agar
4. Autoclave the agar and broth media at 121°C for 15 minutes.

Agar formula for induced system

Formula per Liter

Yeast nitrogen base (Difco Laboratories)	6.7 g
Amino acid mixtures lacking uracil (Sigma)	1.92 g
Bactro™ agar (Difco Laboratories)	20.0 g
Galactose (Difco Laboratories)	20.0 g

Media preparation

1. Suspend the powder in of purified water to 900 ml: 6.7 g of yeast nitrogen base and 1.92 g of amino acid mixtures lacking uracil. Mix thoroughly to completely dissolve the powder.
2. Adjusted media to pH 7.2 by 1N NaOH
3. Add 20.0 g of Bactro™ agar
4. Autoclave the agar and broth media at 121°C for 15 minutes.
5. Add 100 ml of 20% galactose (20 g galactose/100 ml purified water), filter-sterilized through a 0.45 µm filter.

Table A1 The number of yeast colony forming unit.

Serial dilutions of yeast cultures	Yeast colony forming unit per plate			
	Plate 1	Plate 2	Plate 3	Average
1 ($O.D._{600}$ = 0.3)	> 300	> 300	> 300	> 300
10^{-1}	> 300	> 300	> 300	> 300
10^{-2}	> 300	> 300	> 300	> 300
10^{-3}	> 300	> 300	> 300	> 300
10^{-4}	46	68	52	58.6
10^{-5}	7	10	5	7.3
10^{-6}	0	0	0	0

APPENDIX B

Bioassay laboratory protocol

1. Cytotoxic against primate cell line (Vero)

Method:	Green fluorescent protein (GFP) detection
Positive control:	Ellipticine
Negative control:	0.5% DMSO
Maximum final test concentration:	50 µg/ml

The GFP-expressing Vero cell line was generated in-house by stably transfecting the African green monkey kidney cell line (Vero, ATCC CCL-81), with pEGFP-N1 plasmid (Clontech). The cell line is maintained in minimal essential medium supplemented with 10% heat-inactivated fetal bovine serum, 2 mM L-glutamine, 1 mM sodium pyruvate, at 37°C in a humidified incubator with 5% CO_2.

The assay is carried out by adding 45 µl of cell suspension at $3.3x10^4$ cells/ml to each well of 384-well plates containing 5 µl of test compounds previously diluted in 0.5% DMSO, and then incubating for 4 days in 37°C incubator with 5% CO_2. Fluorescence signals are measured by using SpectraMax M5 microplate reader (Molecular Devices, USA) in the bottom reading mode with excitation and emission wavelengths of 485 and 535 nm. Fluorescence signal at day 4 is subtracted with background fluorescence at day 0. The percentage of cytotoxic is calculated by the following equation, where FU_T and FU_C represent the fluorescence units of cells treated with test compound and untreated cells, respectively.

$$\% \text{ cytotoxicity} = [1-(FU_T/ FU_C)]x100$$

IC_{50} values are derived from dose-response curves, using 6 concentrations of 2-fold serially diluted samples, by the SOFTMax Pro software (Molecular device). Ellipticine and 0.5% DMSO are used as a positive and a negative control, respectively.

2. Cancer cell growth inhibition

Method:	Resazurin microplate assay (REMA)
Positive control:	Ellipticine and doxorubicin
Negative control:	0.5% DMSO
Maximum final test concentration:	50 µg/ml

Three cancerous human-cell lines are available for this assay:

1) KB cell line (epidermoid carcinoma of oral cavity, ATCC CCL-17)
2) MCF-7 cell line (breast adenocarcinoma, ATCC HTB-22)
3) NCI-H187 (small cell lung carcinoma, ATCC CRL-5804)

This assay is performed using the method described by Brien *et al.* (2000). In brief, cells at a logarithmic growth phase are harvested and diluted to $7x10^4$ cell/ml for KB and $9x10^4$ cells/ml for MCF-7 and NCI-H187, in fresh medium. Successively, 5 µl of test sample diluted in 5% DMSO, and 45 µl of cell suspension are added to 384-well plates, incubated at 37°C in 5% CO_2 incubator. After the incubation period (3 days for KB and MCF-7, and 5 days for NCI-H187), 12.5 µl of 62.5 µg/ml resazurin solution is added to each well, and the plates are then incubated at 37°C for 4 hours. Fluorescence signal is measured using SpectraMax M5 multi-detection microplate reader (Molecular Devices, USA) at the excitation and emission wavelengths of 530 nm and 590 nm. Percent inhibition of cell growth is calculated by the following equation, where FU_T and FU_C represent the mean fluorescent unit from treated and untreated conditions, respectively.

$$\%Inhibition = [1-(FU_T/FU_C)]x100$$

Dose response curves are plotted from 6 concentrations of 2-fold serially diluted test compounds and the sample concentrations that inhibit cell growth by 50% (IC_{50}) can be derived using the SOFTMax Pro software (Molecular Devices, USA).

Appendix C

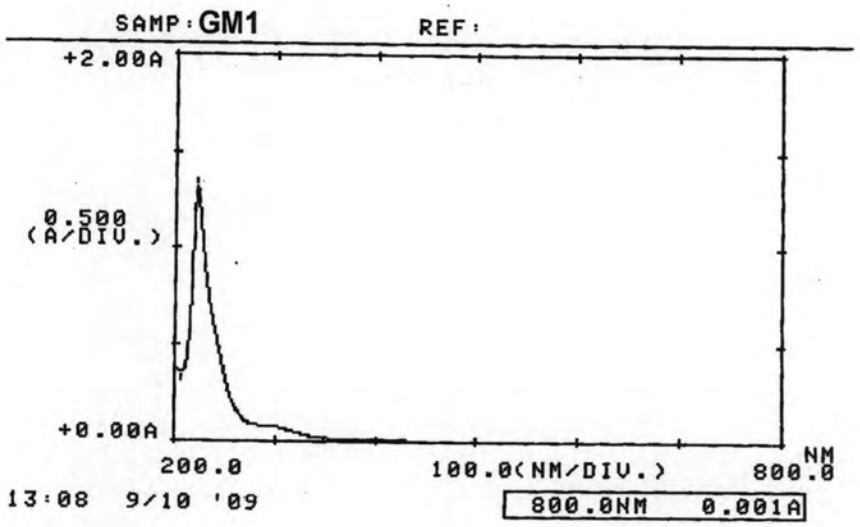

Figure C1 UV spectrum of compound GM1.

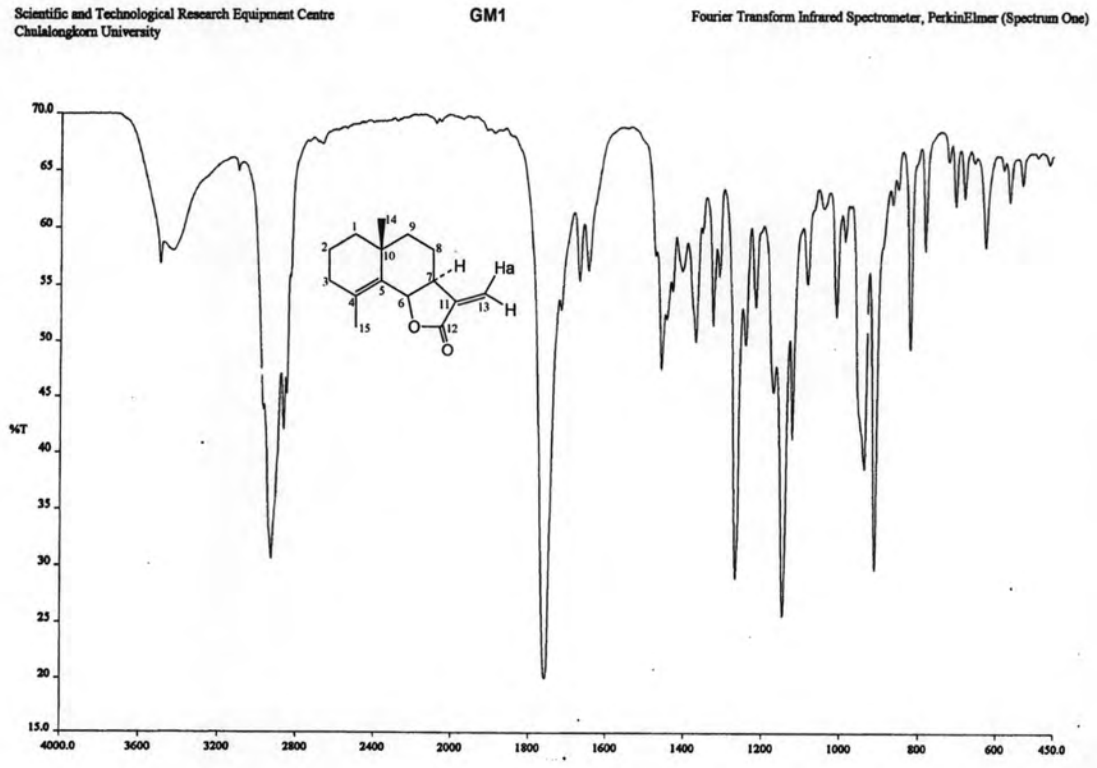

Figure C2 IR spectrum of compound GM1.

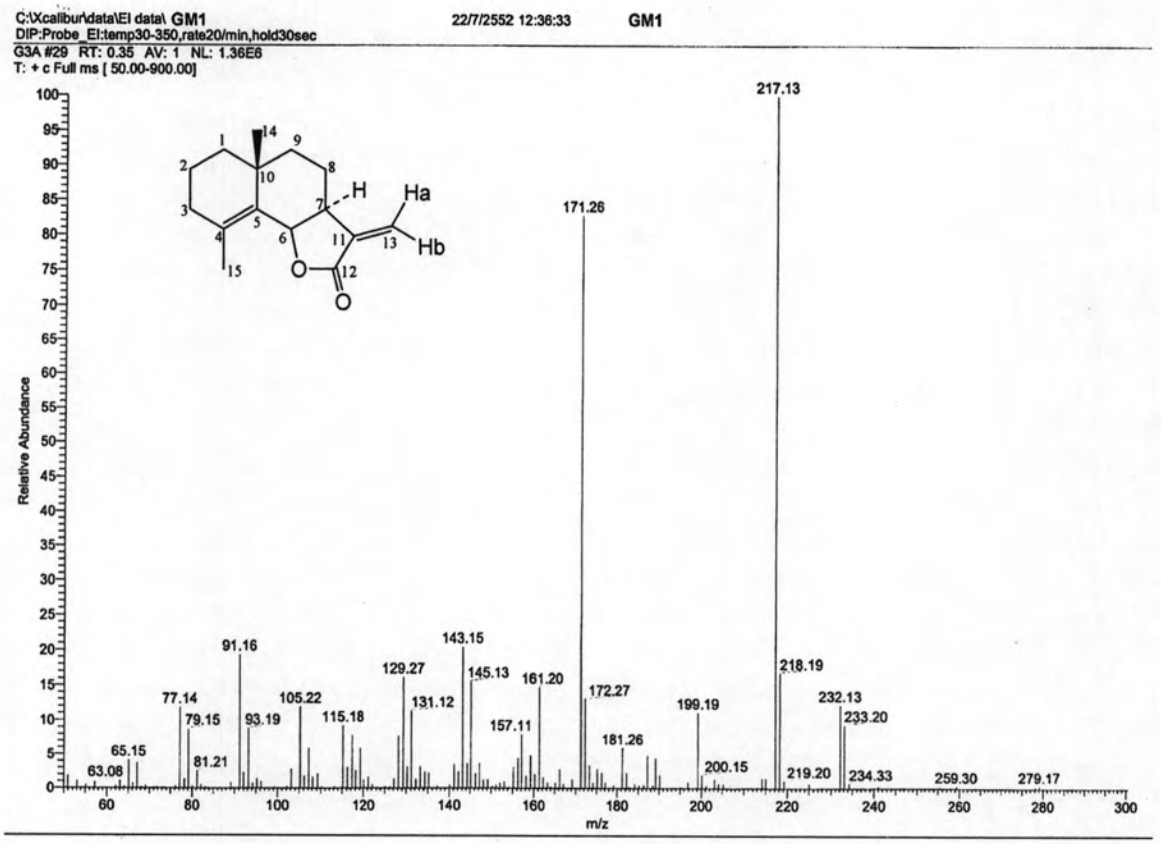

Figure C3 Mass spectrum of compound GM1.

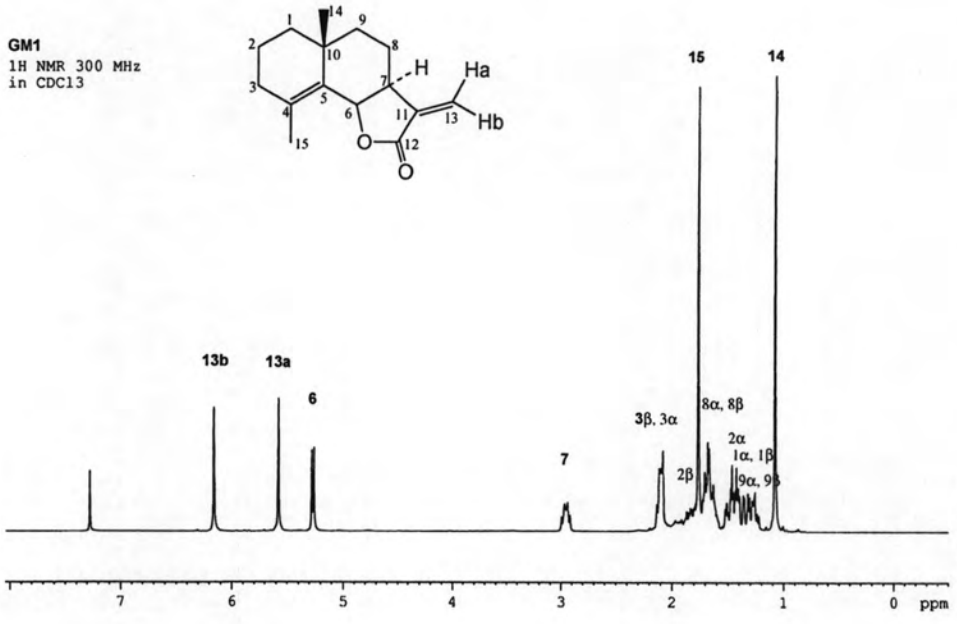

Figure C4 ^{1}H-NMR (300 MHz) spectrum of compound GM1 ($CDCl_3$).

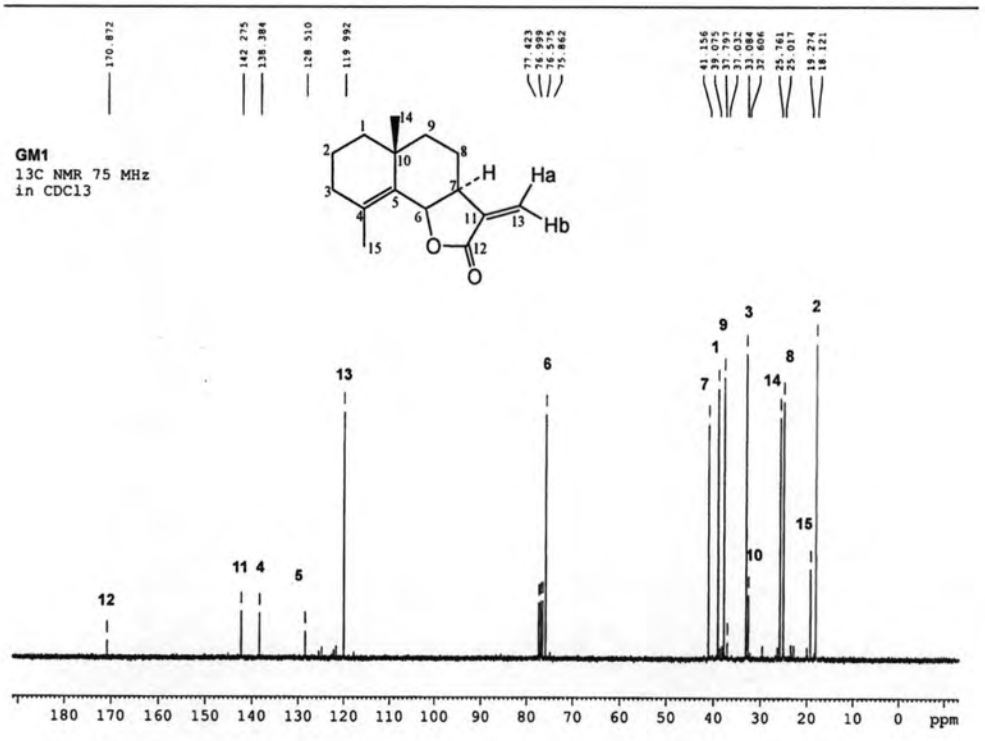

Figure C5 ^{13}C-NMR (75 MHz) spectrum of compound GM1 ($CDCl_3$).

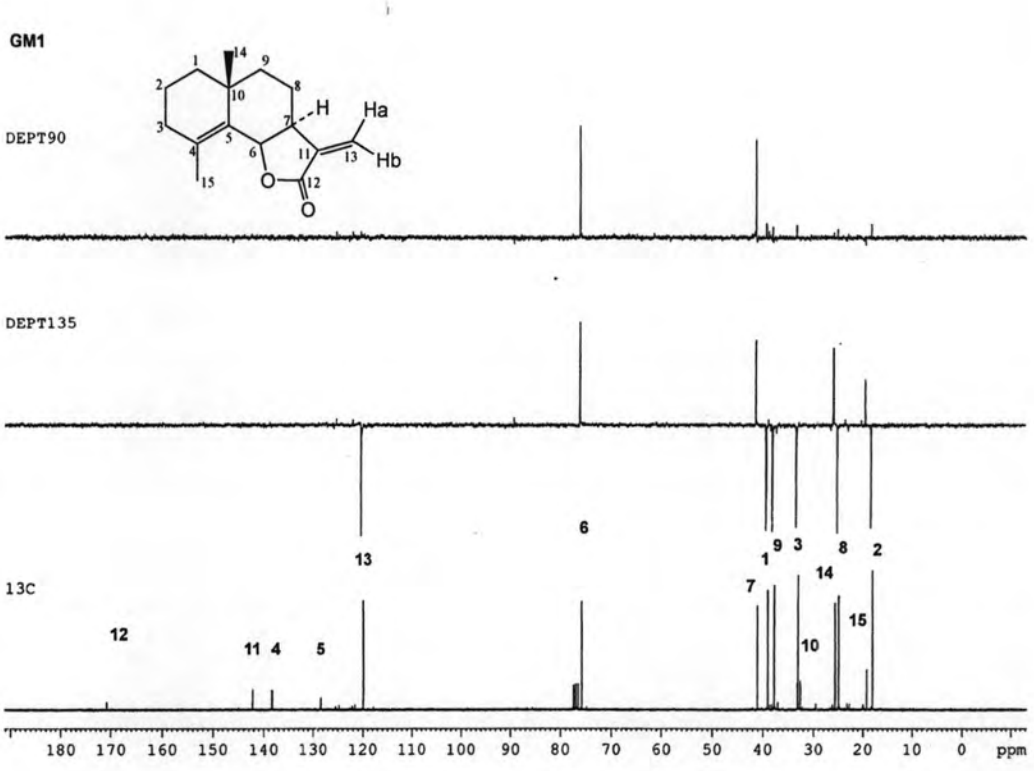

Figure C6 DEPT spectrum of compound GM1 ($CDCl_3$).

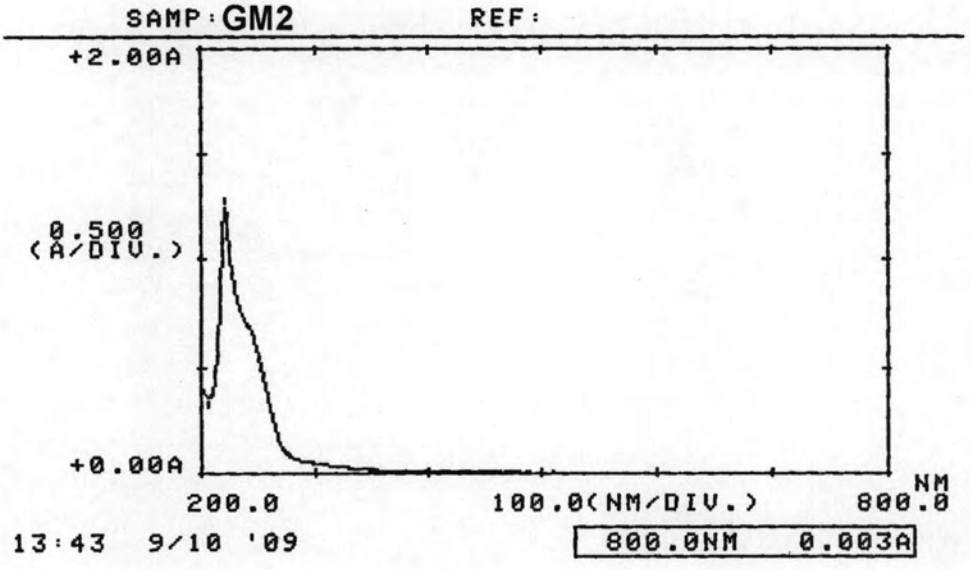

Figure C7 UV spectrum of compound GM2.

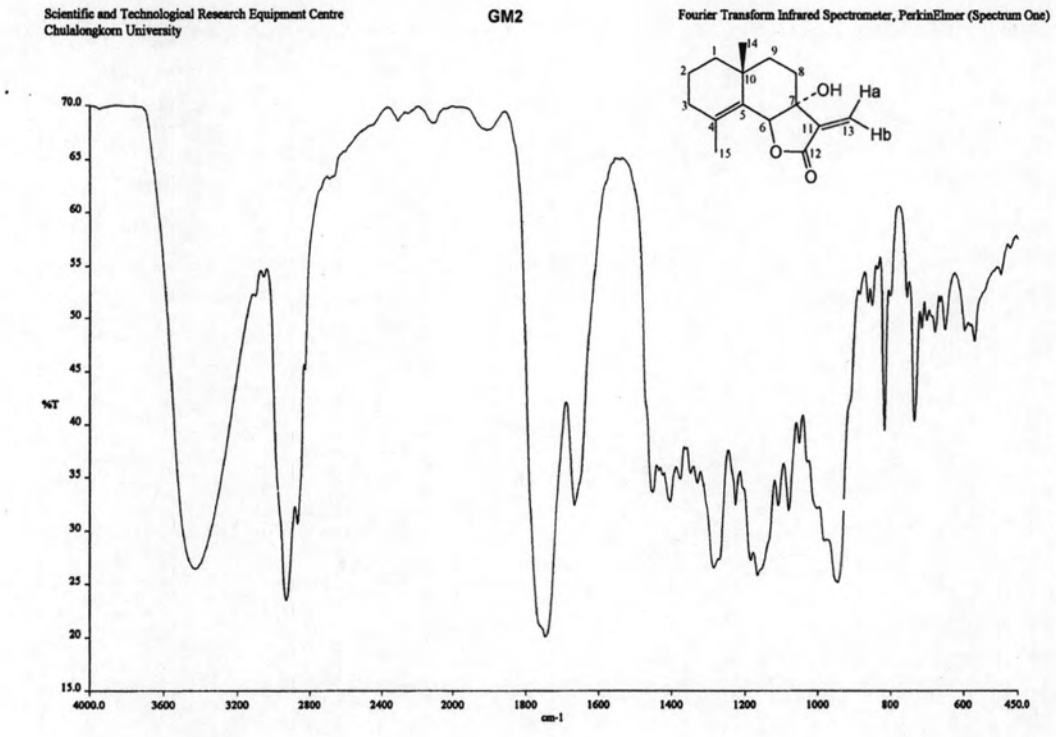

Figure C8 IR spectrum of compound GM2.

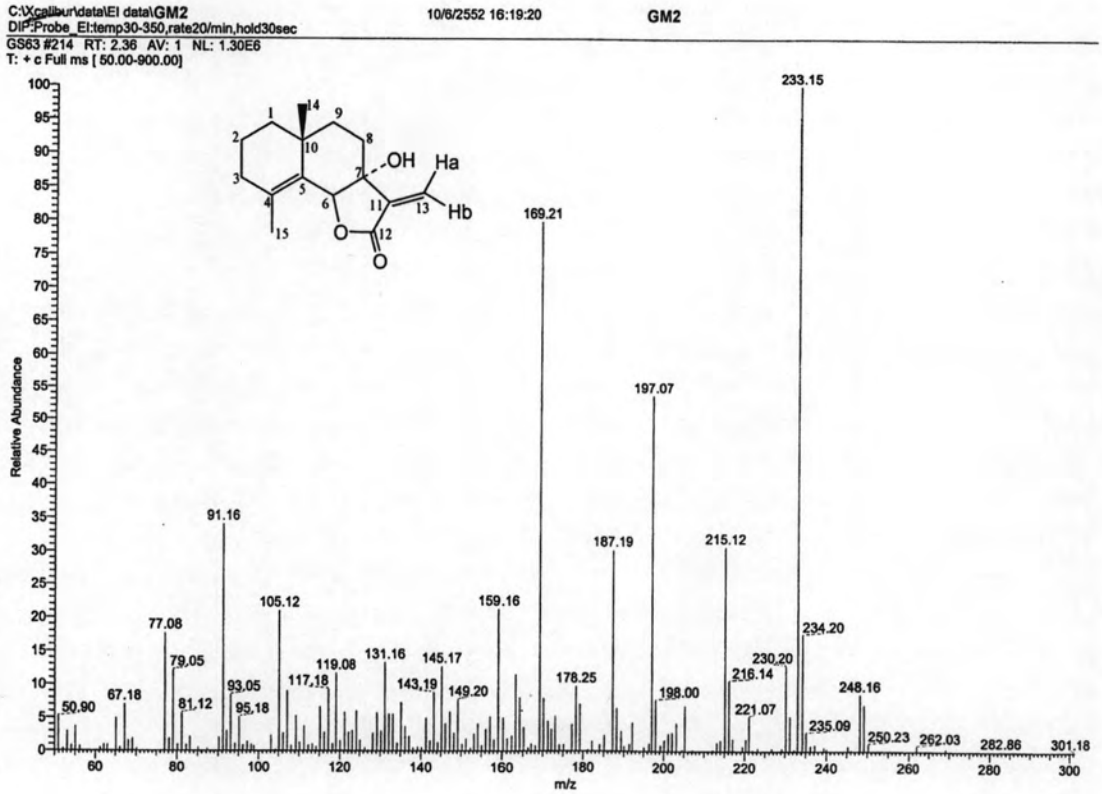

Figure C9 Mass spectrum of compound GM2.

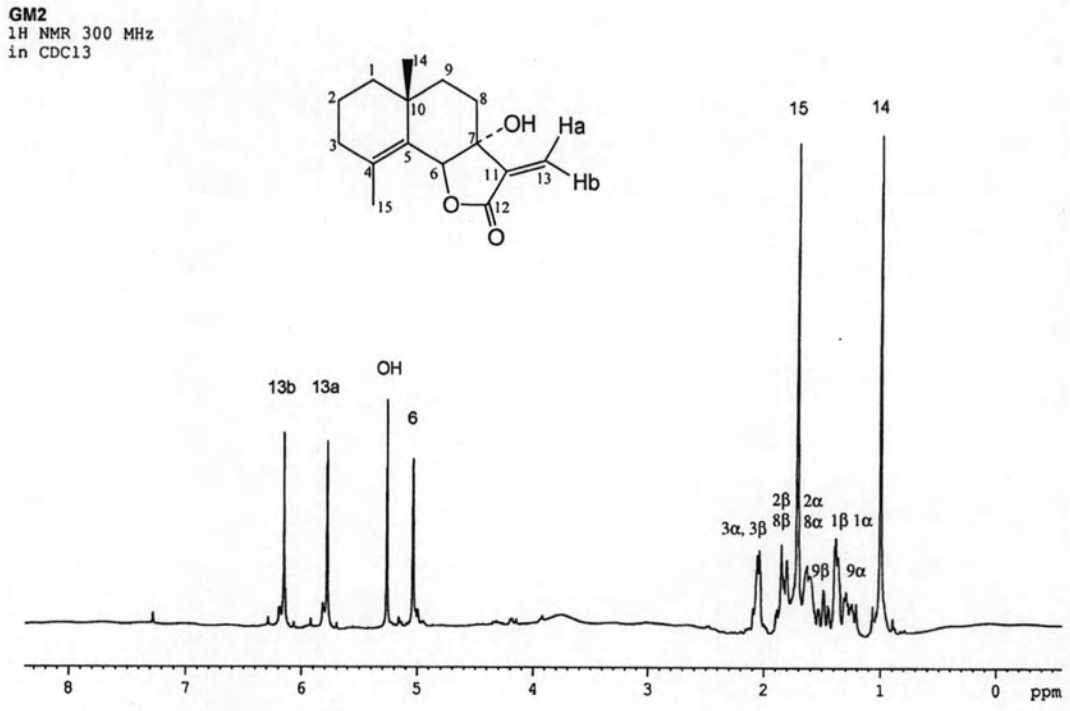

Figure C10 ^{1}H-NMR (300 MHz) spectrum of compound GM2 ($CDCl_3$).

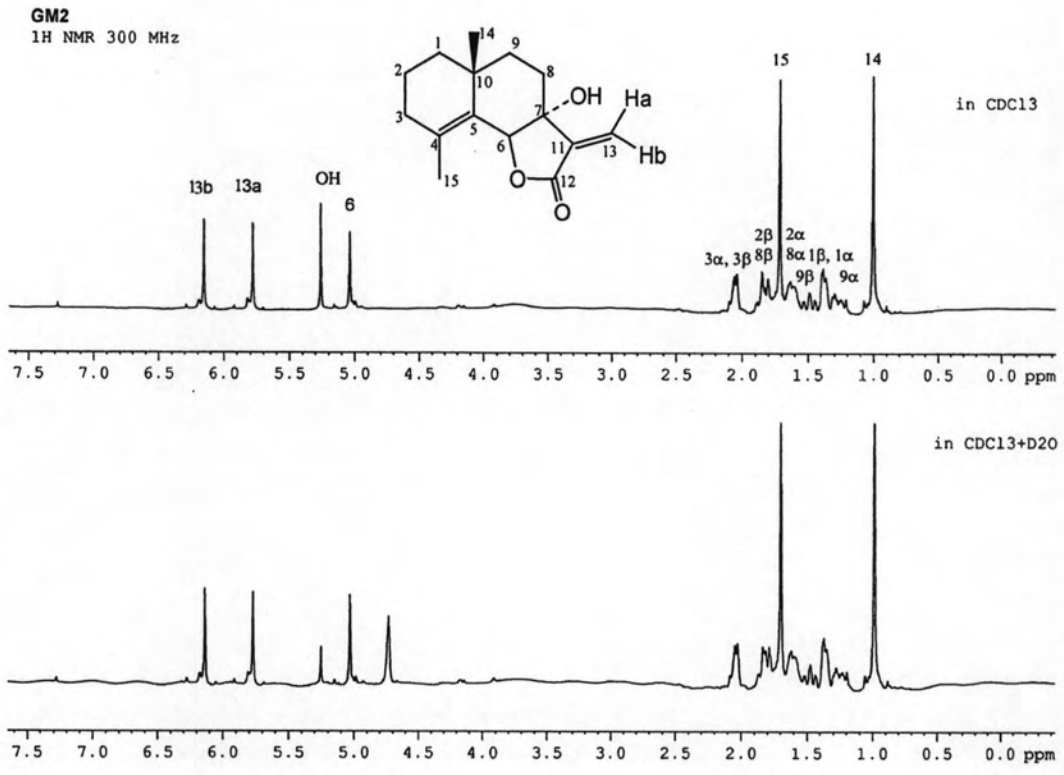

Figure C11 ^{1}H-NMR (300 MHz) spectrum of compound GM2 ($CDCl_3$).

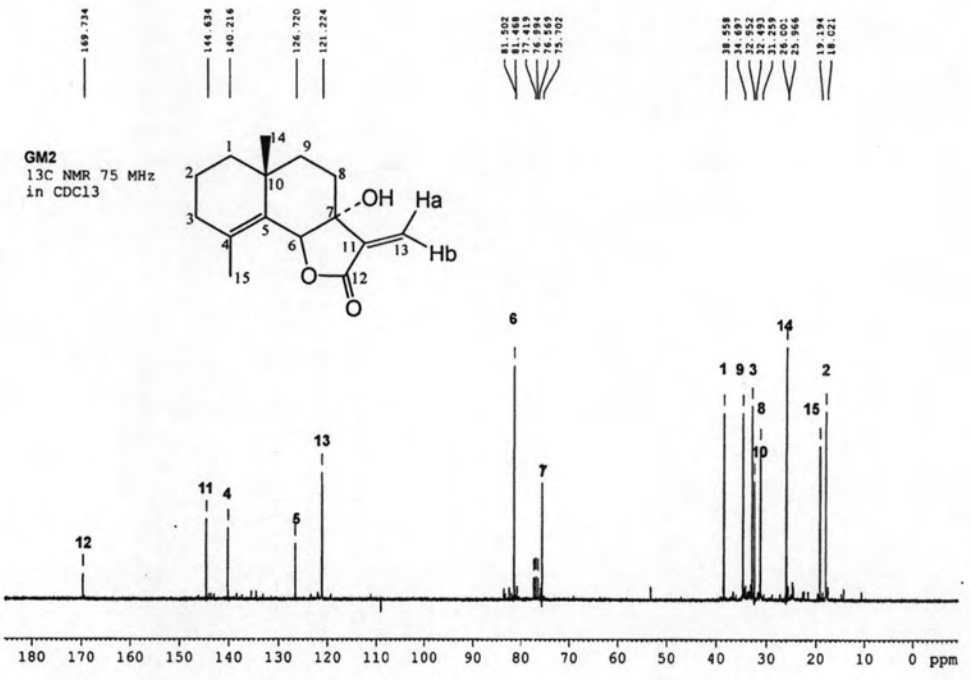

Figure C12 ^{13}C-NMR (75 MHz) spectrum of compound GM2 ($CDCl_3$).

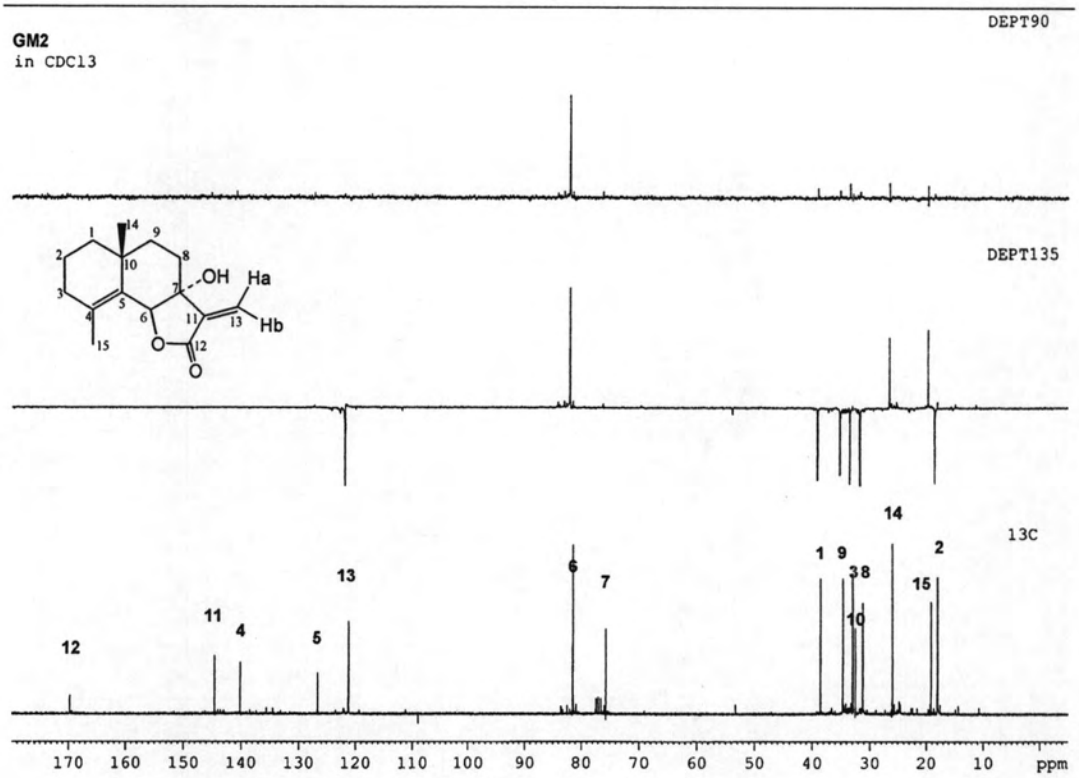

Figure C13 DEPT spectrum of compound GM2 ($CDCl_3$).

VITA

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Oral presentation

Oral Presentation Awards of the 6th Thai Traditional and Alternative Medicine Conference 2009, August 2-4, 2009, Nonthaburi, Thailand.

Uppatanpreecha, P., Laorpaksa, A, Sirikantaramas, S., and Sukrong, S., Screening for topoisomerase I-inhibitory activity from Thai medicinal plants by yeast cell-based assay. Proceeding of the 6th Thai Traditional and Alternative Medicine Conference, August 2-4, 2009, IMPACT Exhibition and Convention Center, Nonthaburi, Thailand.