# สารเคมีจากฟองน้ำทะเลของไทย *Biemna fortis*

นางสาวลัดดา ฐิติธนภัค

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาเภสัชศาสตรมหาบัณฑิต

ภาควิชาเภสัชเวท

บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

พ.ศ. 2538

ISBN 974-631-635-4

# Chemical Constituents from the Thai Marine Sponge, *Biemna fortis*

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Pharmacy
Department of Pharmacognosy
Graduate School
Chulalongkorn University
1995

ISBN 974-631-635-4

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|---|---|
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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสีเขียวนี้เพียงแผ่นเดียว

สัดดา ฐิติธนภัค : สารเคมีจากฟองน้ำทะเลของไทย *Biemna fortis* (CHEMICAL CONSTITUENTS FROM THE THAI MARINE SPONGE, *Biemna fortis*), อาจารย์ที่ปรึกษา : อาจารย์ ดร. คณิต สุวรรณบริรักษ์, อาจารย์ที่ปรึกษาร่วม : รศ. อิงอร มันทรานนท์, 215 หน้า. ISBN 974-631-635-4

จากการสกัดแยกสิ่งสกัดเมธานอลของฟองน้ำทะเลของไทย *Biemna fortis* (Topsent) โดยอาศัยผลการทดสอบฤทธิ์ทางชีวภาพของความเป็นพิษต่อเซลล์มะเร็ง ประกอบกับข้อมูลทางสเปคตรัมของ $^{1}$H-NMR สามารถแยกสารที่มีฤทธิ์ทางชีวภาพ ได้สารกลุ่ม polyethers นอกจากนี้ยังแยกสารกลุ่ม diene-unsaturated steroid ได้ 3 ชนิด จากการวิเคราะห์ข้อมูลทางสเปคตรัมของ UV, IR, MS, 1D และ 2D-NMR สามารถพิสูจน์สูตรโครงสร้างของสารทั้ง 3 ชนิด ได้ คือ Brassicasterol, Cerevisterol และ 22(*E*)-ergosta-7,22-dien-3,5-diol-6-one

ภาควิชา เภสัชเวท ลายมือชื่อนิสิต .....

สาขาวิชา - ลายมือชื่ออาจารย์ที่ปรึกษา .....

ปีการศึกษา 2537 ลายมือชื่ออาจารย์ที่ปรึกษาร่วม .....

##C575439 : MAJOR PHARMACOGNOSY
KEY WORD: *BIEMNA FORTIS*/ MARINE SPONGE/ BIOACTIVE COMPOUNDS/ CHEMICAL CONSTITUENTS
LADDA THITITHANAPHUK : CHEMICAL CONSTITUENTS FROM THE THAI MARINE SPONGE, *Biemna fortis*. THESIS ADVISOR : KHANIT SUWANBORIRUX, Ph.D., CO-ADVISOR : ASSO. PROF. ING-ON MONDRANONDRA, M.Sc. 215 pp. ISBN 974-631-635-4

The isolation of bioactive polyether compounds from the methanol extract of Thai marine sponge, *Biemna fortis* was guided by both tumor cytotoxicity and $^{1}$H-NMR signals. Moreover, three diene-unsaturated steroid compounds, brassicasterol, cerevisterol and 22(*E*)-ergosta-7,22-dien-3,5-diol-6-one, were isolated from the same extract. The identification and structure elucidation of the isolated steroids were achieved by analyses of the UV, IR, MS, 1D and 2D-NMR spectral data.

ภาควิชา เภสัชเวท ลายมือชื่อนิสิต .....

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ปีการศึกษา 2537 ลายมือชื่ออาจารย์ที่ปรึกษาร่วม .....

# ACKNOWLEDGMENTS

I would like to take this opportunity to express my sincere thank to Dr. Khanit Suwanborirux of the Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, who acted as my advisor during the master degree education, with his enormous knowledge and experience in the field of pharmacognosy and chemistry, many scientific problems which were beyond my knowledge had been solved following his guidance. I am greatly indebted to him for his endless support, inspiration and valuable advice.

I am very grateful to Associate Professor Ing-on Mondranondra, my co-advisor, Associate Professor Chaiyo Chaichantipyuth, Assistant Professor Noppamas Suppakun, and all members of my group meeting for their kindness, helpful, encouragement and friendship. Their criticism and suggestion gave me a lot of ideas to solve various problems. I am convinced that they have been a good team members of mine which I will never forget.

This work could not be complete without gracious helpful of Professor Piamsak Menasaveta, the director of Aquatic Resource Research Institute, Chulalongkorn University, for his kindly support in the sample collection, Dr. Jun-ichi Tanaka of the Department of Marine Sciences, University of the Ryukyus, for his assistance in the NMR and MS experiments and all operators of NMR spectrometer, and my department life having been seasoned with a variety of personalities. I am very thankful for their help and friendship. Otherwise, I will miss their friendliness forever.

I wish to thank the Graduate school of Chulalongkorn University for granting partial financial support, National Center for Genetic Engineering and Biotechnology.

Finally, I wish to express my infinite gratitude to my family, Dr. Somprasong Srichai and my lovely friends for their love, understanding and encouragement throughout this graduate study.

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# ABBREVIATIONS

| | |
|---|---|
| $\varepsilon$ | = molar absorptivity |
| $\varepsilon_{max}$ | = maximum molar absorptivity |
| $\delta$ | = chemical Shift |
| $\mu g$ | = microgram |
| $\mu l$ | = microliter |
| $\mu M$ | = micromolar |
| $\nu_{max}$ | = wavenumber at maximum absorption |
| $\xi$ | = Greek Xi |
| $\lambda max$ | = wavelength at maximum absorption |
| br. d | = broad doublet (for NMR spectra) |
| $^{o}C$ | = degree celsius |
| $^{13}C$-NMR | = carbon-13 nuclear magnetic resonance |
| cm. | = centimeter |
| COSY | = correlated Spectroscopy |
| d | = doublet (for NMR spectra) |
| dd | = doublets of doublet (for NMR spectra) |
| ddd | = doublets of doublets of doublet (for NMR spectra) |
| DEPT | = Distortionless Enhancement by Polarization Transfer |
| 1D-NMR | = One Dimentional Nuclear Magnetic Resonance |
| 2D-NMR | = Two Dimentional Nuclear Magnetic Resonance |
| dt | = doublets of triplet (for NMR spectra) |
| *E* | = Entgegen : against |
| $ED_{50}$ | = 50% Effective Dose |
| EIMS | = Electron Impact Mass Spectrum |
| eV | = electron volt |
| Fig. | = Figure |
| FTIR | = Fourier Transform Infrared |
| g | = gram |
| HIV-I | = Human Immunodeficiency Virus type 1 |
| $^{1}H$-NMR | = Proton Nuclear Magnetic Resonance |
| HMBC | = Heteronuclear Multiple Bond Coherent |
| HMQC | = Heteronuclear Multiple Quantum Coherent |
| HOHAHA | = Homonuclear Hartman Hahn |

| | |
|---|---|
| HPLC | = High-Performance Liquid Chromatography |
| HSQC | = $^{1}$H-detected Heteronuclear Single Quantum Coherent |
| Hz | = Hertz |
| $ID_{50}$ | = 50% Inhibition Dose |
| IR | = Infrared |
| *J* | = coupling constant |
| kg | = kilogram |
| l | = liter |
| $LD_{50}$ | = 50% Lethal Dose |
| m | = multiplet (for NMR spectrum) |
| $M^{+}$ | = molecular ion |
| mg | = miligram |
| MHz | = mega Hertz |
| ml | = mililiter |
| ml/min | = mililiter per minutes |
| mm | = milimeter |
| *m/e* | = Mass to charge ratio |
| MS | = Mass Spectrometry |
| NA | = Nutrient Agar |
| nm | = nanometer |
| NMR | = Nuclear Magnetic Resonance |
| No | = Number |
| NOESY | = Nuclear Overhauser Engancement Spectroscopy |
| PDQFH | = Phase Sensitive Double Quantum Filter $^{1}$H-$^{1}$H COSY |
| ppm | = part per million |
| q | = Quartet (for NMR spectrum) |
| s | = singlet (for NMR spectrum) |
| SCUBA | = Self - Contained Underwater Breathing Apparatus |
| SDA | = Sabouraud Dextrose Agar |
| sp. | = species |
| spp. | = species |
| t | = triplet (for NMR spectra) |
| td | = triplets of douplet (for NMR spectra) |
| TLC | = Thin Layer Chromatography |
| TMS | = Tetramethylsilane |
| TSA | = Trypticase Soy Agar |

| | |
|---|---|
| UV | = Ultraviolet |
| v/v | = volume by volume |
| w/w | = weight by weight |
| Z | = Zusammen : together |