



## REFERENCES

- Abe, M.O., and Taylor, D.A.H. "A Quinolone Alkaloid from *Oricia suaveolens*." Phytochemistry 10 (May 1971): 1167-1169.
- Adams, C.D.; Taylor, D.R., and Warner, J.M. "N-Methylflindersine from *Spathelia sorbifolia*." Ibid. 12 (July 1973): 1359-1360.
- Akhmedzhanova, V.I.; Bessonova, I.A., and Yunusov, S. Yu. "Haplamine, a New Alkaloid from *Haplophyllum perforatum*." Chemical Abstracts 80 (1974): 121153n.
- Akhmedzhanova, V.I.; Bessonova, I.A., and Yunusov, S. Yu. "Study of *Dictamnus angustifolius* Roots." Ibid. 89 (1978): 176371y.
- Aneja, R.; Mukerjee, S.K., and Seshadri, T.R. "A Study of the Origin and Modifications of the C<sub>5</sub> Unit in Plant Products: New Synthesis of Angelicin and Psoralen." Tetrahedron 4 (1958): 256-270.
- Asatiani, V.S.; Kikvidze, I.M.; Bessonova, I.A.; Mudzhipi, K.S., and Yunusov, S. Yu. "Alkaloid of Fraxinella, *Dictamnus caucasicus*. -Phagarine, 6,8-Dimethoxyisodictamine, 6-Methoxyisodictamine, Robustine, and Isodictamine." Chemical Abstracts 76 (1971): 56582c.
- Backer, C.A., and Bakhuizen van den Brink Jr., R.C. Flora of Java. Vol. 2. Leiden: Rijksherbarium, 1965.
- Beyerman, H.C., and Rooda, R.W. "Alkaloids of *Lunasia amara*. The complete Structure of Lunasia II." Chemical Abstracts 54 (1960): 18573b.

- Bhakuni, D.S.; Gupta, N.C.; Satish, S.; Sharma, S.C.; Shukla, Y.N., and Tandon, J.S. "Ericaceae and Other Families: Chemical Constituents of *Actinodaphne augustifolia*, *Croton sparsiflorus*, *Duabanga sonneratiodes*, *Glycosmis mauritiana*, *Hedyotis auricularia*, *Lyonia ovalifolia*, *Micromelum pubescens*, *Pyrus pashia* and *Rhododendron niveum*." Phytochemistry 10 (1971): 2247-2249.
- Bosson, J.A.; Rasmussen, M.; Ritchie, E.; Robertson, A.V., and Taylor, W.C. "The Chemical Constituents of Australian *Flindersia* Species XVII. The Structure of Ifflaiamine." Australian Journal of Chemistry 16 (June 1963): 480-490.
- Bowen, I.H., and Lewis, J.R. "Rutaceous Constituents Part XI. Flindersine from the Leaves of *Atalantia roxburghiana*." Lloydia 41 (March-April 1978): 184-185.
- Bowman, R.M.; Grundon, M.F., and James, K.J. "A New Synthesis of 2,2-Dimethylchromenoquinolines from Epoxides: Synthesis of the Alkaloid Flindersine." Chemical Communications (1970): 666-667.
- Bowman, R.M.; Grundon, M.F., and James, K.J. "Quinoline Alkaloids. Part XVI. 2,2-Dimethylpyranoquinolines from Base-catalysed Rearrangement of Isoprenyl Epoxides. Synthesis and Biogenesis of Flindersine." Journal of the Chemical Society Perkin I No. 10 (1973): 1055-1059.
- Brown, R.F.C.; Hobbs, J.J.; Hughes, G.K., and Ritchie, E. "The Chemical Constituents of Australian *Flindersia* Species VI. The Structure and Chemistry of Flindersine." Australian Journal of Chemistry 7 (November 1954): 348-377.

- Brown, R.F.C.; The Late Hughes, G.K., and Ritchie, E. "The Chemical Constituents of Australian *Flindersia* Species IX. A Synthesis of Flindersine." Ibid. 9 (May 1956): 277-282.
- Brown, S.A. "Biosynthetic Studies on Coumarins." Planta Medica 36 (August 1979): 299-310.
- Burkill, I.H. A Dictionary of the Economic Products of the Peninsula Vol. 2. Oxford: University Press, 1870.
- Campbell, N. "Bicyclic Compounds Containing a Pyridine Ring: Quinoline and Its Derivatives." In Rodd's Chemistry of Carbon Compounds, Part F, Vol. 4. 2d ed. p. 323. Edited by S. Coffey. Amsterdam: Elsevier Scientific Publishing, 1976.
- Cassady, J.M.; Ojima, N.; Chang, C., and McLaughlin, J.L. "An Investigation of *Micromelum integerrimum* (Rutaceae)." Lloydia 42 (May-June 1979): 274-277.
- Chamberlain, T.R., and Grundon, M.F. "Quinoline Alkaloids. Part XI. A Study of the Claisen Rearrangement of the 3,3-Dimethylallyl Ether of 4-Hydroxy-1-methyl-2-quinolone. Synthesis of Ifflaamine and the Identification of a New Alkaloid from *Flindersia iffliana* F. Muell." Journal of the Chemical Society C (1971): 910-914.
- Chatterjee, A.; Dutta, C.P., and Bhattacharyya, S. "Micromelin and Micropubescin: Two New Coumarins from *Micromelum pubescens*." Chemical Abstracts 69 (1968): 2887t.
- Collins, J.F., and Grundon, M.F. "The Biosynthesis of Isonorenoid Quinoline Alkaloids." Chemical Communications (1969): 621-622.

- Cope, A.C., and Heeren, J.K. "Proximity Effects. XLII. The Reaction of Lithium Diethylamide with *cis*- and *trans*-4-Octene Oxide." Journal of the American Chemical Society 87 (July 1965): 3125-3129.
- Corral, R.A., and Orazi, O.O. "Isolation, Structure and Synthesis of (±) -Ribalinine." Tetrahedron Letters No. 7 (February 1967): 583-585.
- Corral, R.A.; Orazi, O.O., and Benages, I.A. "Ribalinidine, a Phenolic Tertiary Base from *Balfourodendron*." Ibid. No. 5 (January 1968): 545-547.
- Das, B.P., and Chowdhury, D.N. "Glycosolone: A New Quinolone Alkaloid from *Glycosmis pentaphylla* (Retz) DC." Chemistry and Industry 15 (April 1978): 272-273.
- Dreyer, D.L. "Coumarins and Alkaloids of the Genus *Ptelea*." Phytochemistry 8 (1969): 1013-1020.
- Dreyer, D.L., and Lee, A. "Extractives of *Geijera parviflora*." Ibid. 11 (February 1972): 763-767.
- Elderfield, R.C. "The Chemistry of Quinoline." In Heterocyclic Compounds, Vol. 4. p. 4. Edited by R.C. Elderfield. New York: John Willey & Sons, 1952.
- Ellis, B.E., and Brown, S.A. "Isolation of Dimethylallylpyrophosphate: Umbelliferone Dimethylallyltransferase from *Ruta graveolens*." Canadian Journal of Biochemistry 52 (September 1974): 734-738.
- Engler, A., and Prantl, K. Die Natürlichen Pflanzenfamilien. Vol. 19a. 2d ed. Leipzig: Verlag von Wilhelm Engelmann, 1931.

- Eshiet, I.T., and Taylor, D.A.H. "Extractives from *Fagara zanthoxyloides* (Lam.)." Chemical Communication No. 14 (July 1966): 467-468.
- Eshiet, I.T., and Taylor, D.A.H. "The Isolation and Structure Elucidation of Some Derivatives of Dimethylallyl-coumarin, Chromone, Quinoline, and Phenol from *Fagara* Species, and from *Cedrelopsis grevei*." Journal of the Chemical Society C (1968): 481-484.
- Eskairov, M.; Sidyakin, G.P., and Yunusov, S. Yu. "Alkaloids of *Haplophyllum foliosum*, Foliosidine." Chemical Abstracts 53 (1959): 9574f.
- Faizutdinova, Z. Sh.; Bessonova, I.A., and Yunusov, S. Yu. "The Structure of Folifine and Folifidine." Ibid. 67 (1967): 108803m.
- Fakhrutdinova, I.M.; Sidyakin, G.P., and Yunusov, S. Yu. "Alkaloids of *Haplophyllum foliosum*, Khaplofoline." Ibid. 59 (1963): 15331b.
- Finlayson, A.C., and Prager, R.H. "Biosynthetic Studies on Alkaloids in *Lunasia amara*." Australian Journal of Chemistry 31 (December 1978): 2751-2755.
- Floss, H.G., and Paikert, H. "Biosynthesis of Furanocoumarins in *Pimpinella magna* (Umbelliferae)." Phytochemistry 8 (1969): 589-596.
- Geissman, T.A., and Crout, D.H.G. Organic Chemistry of Secondary Plant Metabolism. California: Freeman Cooper & Company, 1969.
- Gellert, M.; Novak, I.; Szendrei, K.; Reisch, J., and Minker, E. "Quinoline Alkaloids of *Dictamnus albus*." Chemical Abstracts 79 (1973): 2768m.
- Goodwin, S., and Horning, E.C. "Alkaloids of *Lunasia amara* Blanco. Structure of Lunacrine." Journal of the American Chemical Society 81 (April 1959): 1908-1912.

- Goodwin, S.; Shoolery, J.N., and Horning, E.C. "Alkaloids of *Lunasia amara* Blanco. Hydroxylunacridine." Ibid. 81 (July 1959a): 3736-3738.
- Goodwin, S.; Smith, A.F.; Velasquez, A.A., and Horning, E.C. "Alkaloids of *Lunasia amara* Blanco. Isolation Studies." Ibid. 81 (December 1959b): 6209-6213.
- Gray, A.I., and Waterman, P.G. "Review Coumarins in the Rutaceae." Phytochemistry 17 (1978): 845-864.
- Hansen, B. "Rutaceae." In Studies in the Flora of Thailand, Vol. 23. pp. 284-291. Edited by K. Larsen. Copenhagen: Ejnar Munksgaard, 1966.
- Hill, A.W. Index Kewensis Supplementum VI (1916-1920). Oxford: Clarendon Press, 1926.
- Hill, A.W. Index Kewensis Supplementum VII (1921-1925). Oxford: Clarendon Press, 1929.
- Hill, A.W. Index Kewensis Supplementum VIII (1926-1930). Oxford: Clarendon Press, 1933.
- Hooker, J.D. The Flora of British India. Vol. 1. Dehra Dun and Delhi: Bishen Singh Mahendra Pal Singh and Periodical Experts, 1973.
- Huffman, J.W., and Hsu, T.M. "A One Step Synthesis of Flindersine." Tetrahedron Letters No. 2 (January 1972): 141-143.
- Hutchinson, J. The Families of Flowering Plants. Vol. 1. 2d ed. Oxford: Clarendon Press, 1959.

- Iriarte, J.; Kincl, F.A.; Rosenkranz, G., and Sondheimer, F. "The Constituents of *Casimiroa edulis* Llave *et* Lex. Part II. The Bark." Journal of the Chemical Society (November 1956): 4170-4173.
- Jackson, B.D. Index Kewensis. Vol. 2. Oxford: Clarendon Press, 1885.
- Johns, S.R.; Lamberton, J.A., and Sioumis, A.A. "The Identification of a Quinolone Alkaloid from *Citrus macroptera* (Rutaceae)." Australian Journal of Chemistry 23 (February 1970): 419-420.
- Johnstone, R.; Price, J.R., and Todd, A.R. "Alkaloids of the Australian Rutaceae: *Lunasia quercifolia* I. 7-Methoxy-1-methyl-2-phenyl-4-quinolone." Ibid. 11 (November 1958):562-574.
- Joshi, P.P.; Shukla, Y.N.; Bhakuni, D.S., and Dhar, M.M. "6-(2,3-Dihydroxy-3-methylbutyl)-7-methoxycoumarin, a New Coumarin from *Micromelum pubescens* Blume." Indian Journal of Chemistry 13 (August 1975): 772-774.
- Korosi, J.; Papp, E.; Szendrei, K.; Novak, I.; Reisch, J., and Minker, E. "Isolation of Quinolone Alkaloids and Coumarins from *Ptelea trifoliata*." Chemical Abstracts 83 (1975): 93836d.
- Lahey, F.N., and McCamish, M. "Acrophylline and Acrophyllidine, Two New Alkaloids from *Acronychia haplophylla*." Tetrahedron Letters No. 12 (February 1968): 1525-1527.
- Lahey, F.N.; McCamish, M., and McEwan, T. "The Alkaloids of *Acronychia haplophylla*." Australian Journal of Chemistry 22 (February 1969): 447-453.

- Lamberton, J.A.; Price, J.R., and Redcliffe, A.H. "Micromelin, a New Coumarin from *Micromelum minutum* (Forst. f.) Seem. (Family Rutaceae)." Ibid. 20 (May 1967): 973-979.
- Lavie, D.; Danieli, N.; Weitman, R., and Glotter, E. "A New Quinolone Type Alkaloid from *Haplophyllum tuberculatum* (Rutaceae)." Tetrahedron 24 (April 1968): 3011-3018.
- Lassak, E.V., and Pinhey, J.T. "The Constituents of *Eriostemon trachyphyllus*." Australian Journal of Chemistry 22 (October 1969): 2175-2185.
- Luckner, M. Secondary Metabolism in Plants and Animals. Translated by T.N. Vasudevan with the assistance of J.L. Wray. New York: Academic Press, 1972.
- Matthes, H., and Schreiber, E. "Poisonous Woods." Chemical Abstracts 9 (1915): 1661.
- McCorkindale, N.J. "The Intensities of the Carbonyl Bands in the Infra-red Spectra of 2- and 4-Quinolones." Tetrahedron 14 (1961): 223-229.
- Metcalf, C.R., and Chalk, L. Anatomy of the Dicotyledons. Vol. 1 Oxford: University Press, 1950.
- Monkovic, I.; Spenser, I.D., and Plunkett, A.O. "Biosynthesis of Dictamnine. The Origin of the Quinoline Nucleus." Canadian Journal of Chemistry 45 (1967): 1935-1948.
- Ollis, W.D., and Sutherland, I.O. "Isoprenoid Units in Natural Phenolic Compounds." In Recent Development in the Chemistry of Natural Phenolic Compounds, p. 84. Edited by W.D. Ollis. Oxford: Pergamon Press, 1961.



- Openshaw, H.T. "Quinoline Alkaloids, Other Than Those of Cinchona." In The Alkaloids Chemistry and Physiology, Vol. 7. pp. 230-231. Edited by R.H.F. Manske. New York: Academic Press, 1960.
- Openshaw, H.T. "Quinoline Alkaloids, Other Than Those of Cinchona." In Ibid. Vol. 9. pp. 223-263. Edited by R.H.F. Manske. New York: Academic Press, 1967.
- Pakrashi, S.C., and Bhattacharyya, J. "Recent Advances in the Chemistry of Rutaceae Alkaloids." Journal of Scientific and Industrial Research 24 (May 1965): 226-242.
- Pastukhova, V.I.; Sidyakin, G.P., and Yunusov, S. Yu. "Alkaloids from *Haplophyllum* IV. Structure of Pholiosidine." Chemical Abstracts 63 (1965): 8425b.
- Paul, B.D., and Bose, P.K. "New Quinolone Alkaloids from *Ravenia spectabilis*." Journal of the Indian Chemical Society 45 (1968): 552-553.
- Piozzi, F.; Venturella, P., and Bellino, A. "An Easy Synthesis of Flindersine." Gazzetta Chimica Italiana 99 (July 1969): 711-714.
- Pongboonrod, S. Maitet Muang Thai. Bangkok: Kasembunakij Press, 1958.
- Prain, D. Index Kewensis Supplementum IV (1906-1910). Oxford: Clarendon Press, 1913.
- Price, J.R. "The Distribution of Alkaloids in the Rutaceae." In Chemical Plant Taxonomy, pp. 429-452. Edited by T. Swain London: Academic Press, 1963.
- Price, J.R., and Willis, J.B. "The Infra-red Spectra of 2- and 4-Quinolones." Australian Journal of Chemistry 12 (November 1959): 589-600.

- Quisumbing, E. Medicinal Plants of the Philippines. Manila: Bureau of Printing, 1951.
- Rapoport, H., and Holden, K.G. "Isolation of Alkaloids from *Balfourodendron niedelianum*. The Structure of Balfourodine." Journal of the American Chemical Society 81 (July 1959): 3738-3743.
- Rapoport, H., and Holden, K.G. "Alkaloids of *Balfourodendron niedelianum*. Balfourodine and Isobalfourodine." Ibid. 82 (August 1960): 4395-4404.
- Rapoport, H., and Holden, K.G. "Alkaloids of *Balfourodendron niedelianum*. The O<sup>4</sup>-Ethyl Analog of Balfourorone." Journal of Organic Chemistry 26 (September 1961): 3585-3587.
- Razzakova, D.M.; Bessonova, I.A., and Yunusov, S. Yu. "Folimine, a New Alkaloid from *Haplophyllum foliosum*." Chemical Abstracts 77 (1972): 72563y.
- Razzakova, D.M.; Bessonova, I.A., and Yunusov, S. Yu. "Alkaloids from *Haplophyllum perforatum*." Ibid. 86 (1977): 136315q.
- Reisch, J.; Korosi, J.; Szendrei, K.; Novak, I., and Minker, E. "Cumarine und Chinolin-Alkaloide aus der Wurzelrinde von *Ptelea trifoliata*." Phytochemistry 14 (July 1975a): 1678-1679.
- Reisch, J.; Korosi, J.; Szendrei, K.; Novak, I., and Minker, E. "7,8-Methelendioxy-Chinolin-Derivate als Nebenalkaloide der Blüten von *Ptelea trifoliata*." Ibid. 14 (1975b): 2722-2723.
- Reisch, J.; Szendrei, K.; Novak, I.; Minker, E.; Korosi, J., and Csedo, K. "Drei Neue Chinolon-(2)-Alkaloide aus *Ptelea trifoliata*." Tetrahedron Letters No. 5 (January 1972): 449-452.

- Reisch, J.; Szendrei, K.; Papay, V.; Minker, E., and Novak, I. "Über Die Strukturen Weiterer Chinolon-(2)-Alkaloide aus *Ptelea trifoliata*." Ibid. No. 22 (May 1970a): 1945-1948.
- Reisch, J.; Szendrei, K.; Papay, V.; Novak, I., and Minker, E. "Ptelefolin -ein Chinolon-(4)-Alkaloid aus *Ptelea trifoliata* L." Ibid. No. 38 (August 1970b): 3365-3368.
- Rickborn, B., and Thummel, R.P. "Stereoselectivity of the Base-Induced Conversion of Epoxides into Allylic Alcohols." Journal of Organic Chemistry 34 (November 1969): 3583-3586.
- Ruangrungsi, N. Assistant Professor of the Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University. Interview, March 1980.
- Ruegger, A., and Stauffacher, D. "Lunidin und Lunidonin, Zwei Neue Alkaloide aus *Lunasia amara* Blanco var. *repanda* (Lauterb. et K. Schum.) Lauterb." Helvetica Chimica Acta 46 (1963): 2329-2336.
- Sastri, N.B. The Wealth of India. Vol. 6. New Delhi: Sree Saraswaty Press, 1962.
- Schweizer, E.E.; Shaffer, E.T.; Hughes, C.T., and Berninger, C.J. "Reactions of Phosphorus Compounds IX. Synthesis of a Series of 2H-1-benzopyrans and Determination of the Mechanism of Reaction." Journal of Organic Chemistry 31 (September 1966): 2907-2911.
- Smitinand, T. Thai Plant Names. Bangkok: Funny Publishing, 1980.
- Spenser, I.D. "Biosynthesis of Alkaloids." In Chemistry of the Alkaloids, p. 714. Edited by S.W. Pelletier. New York: Van Nostrand Reinhold, 1970.

- Steck, W., and Brown, S.A. "Biosynthesis of Angular Furanocoumarins." Canadian Journal of Biochemistry 48 (August 1970): 872-880.
- Storer, R., and Young, D.W. "Constituents of the Root of *Dictamnus albus*." Tetrahedron 29 (1973): 1217-1222.
- Suvatti, C. Flora of Thailand. Vol. 2. Bangkok: Kurusapha Ladprao Press, 1978.
- Szendrei, K.; Novak, I.; Petz, M. Reisch, J.; Bailey, H.E., and Bailey, V.L. "Coumarins and Alkaloids from *Ptelea trifoliata* ssp. *pallida* var. *confinis*." Lloydia 36 (September 1973): 333-337.
- Talapatra, S.K.; Maiti, B.C.; Talapatra, B., and Das, B.C. "Spectabiline, a New Dihydrofuroquinol-4-one Alkaloid from *Lemonia spectabilis* Lindl." Tetrahedron Letters No. 54 (November 1969): 4789-4790.
- Taylor, G. Index Kewensis Supplementum XIV (1961-1965). Oxford: Clarendon Press, 1970).
- Tel's nov, V.A.; Bessonova, I.A., and Yunusov, S. Yu. "Foliosidine Acetonide." Chemical Abstracts 74 (1971 : 112270x.
- Terasaka, M.; Narahashi, K., and Tomikawa, Y. "Alkaloids of the Root-bark of *Orixa japonica* Thunb. X. Isolation of Norrorixine." Chemical and Pharmaceutical Bulletin 8 (December 1960):1142-1143.
- Thailand. Royal Forest Department. Siamese Plant Names. 1st ed. Bangkok: Suri Ratana Press, 1948.
- Torres, R., and Cassels, B.K. "Leaf Alkaloids of *Fagara mayu*." Phytochemistry 17 (1978): 838-839.

- Toube, T.P.; Murphy, J.W., and Cross, A.D. "The Structures of Edulitine and Edulinine XXIV. Spectra and Stereochemistry." Tetrahedron 23 (May 1967): 2061-2065.
- Trimen, H. Hand Book of Flora of the Ceylon. Part I. Dehra Dun and Belhi: Bishen Singh Mahendra Pal Singh and Periodical Experts, 1974.
- Turner, A.B. "Quinone Methides." Quarterly Reviews 18 (1964): 347-360.
- Whalley, W.B. "Some Structural and Biogenetic Relationships of Plant Phenolics." In Recent Developments in the Chemistry of Natural Phenolic Compounds, p. 36. Edited by W.D. Ollis. Oxford: Pergamon Press, 1961.
- Willis, J.C. A Dictionary of the Flowering Plants and Ferns. 7th ed. Revised by H.K. Airy Shaw. London: Cambridge University Press, 1966.

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย



Dragendorff's spray reagent

Solution A : 0.85 g Bismuth subnitrate dissolved in a mixture of 10 ml glacial acetic acid and 40 ml water.

Solution B : 8 g potassium iodide dissolved in 20 ml water.

Spray reagent: prior to use 5 ml of solution A are mixed with 5 ml of solution B under addition of 20 ml of glacial acetic acid. The solution is made up to 100 ml with water.

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

Key to the Fig. 12-16

- C = crude extract  
B = alkaloids from band 1 of the preparative TLC  
V-1 = isolated alkaloid

Solvent systems

- a = ethyl acetate : chloroform = 9 : 1  
b = chloroform : ethyl alcohol = 9 : 1  
c = chloroform : acetone = 5 : 4  
d = diethyl ether : chloroform = 1 : 1  
e = diethyl ether

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

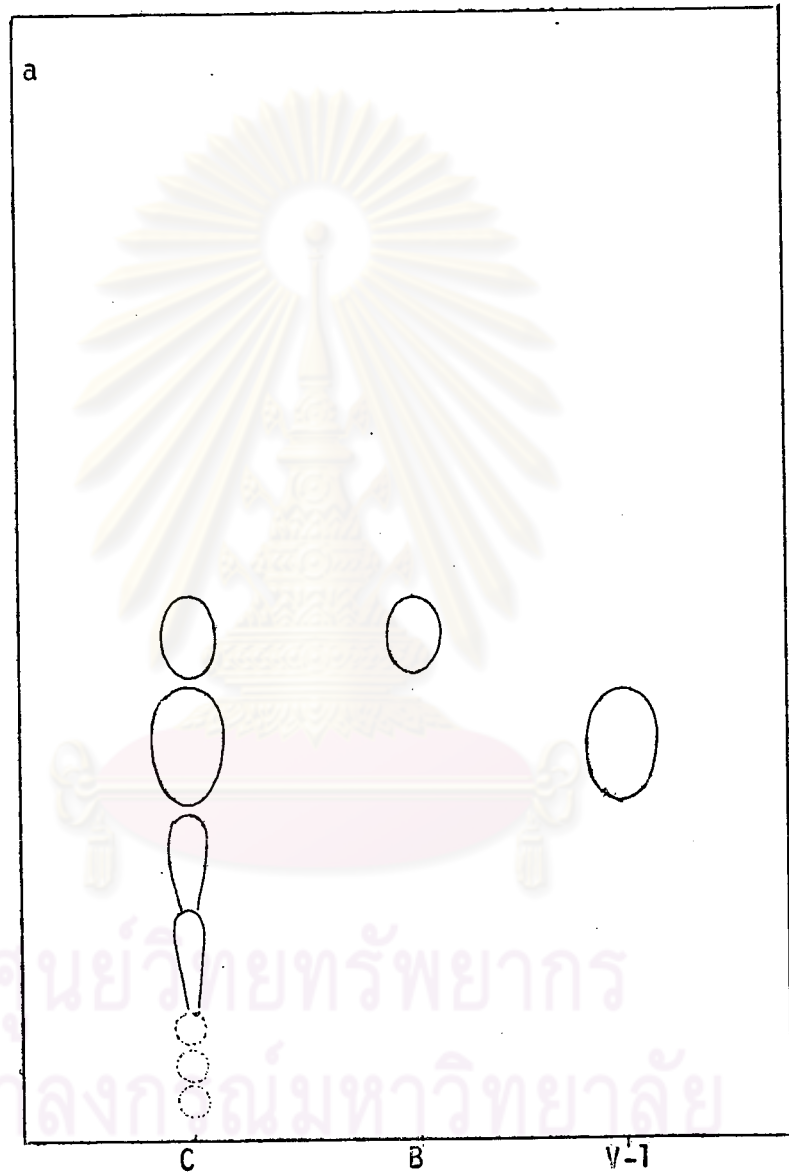


Figure 12. Thin layer chromatogram of alkaloids from the leaves of *Micromelum minutum* Seem.



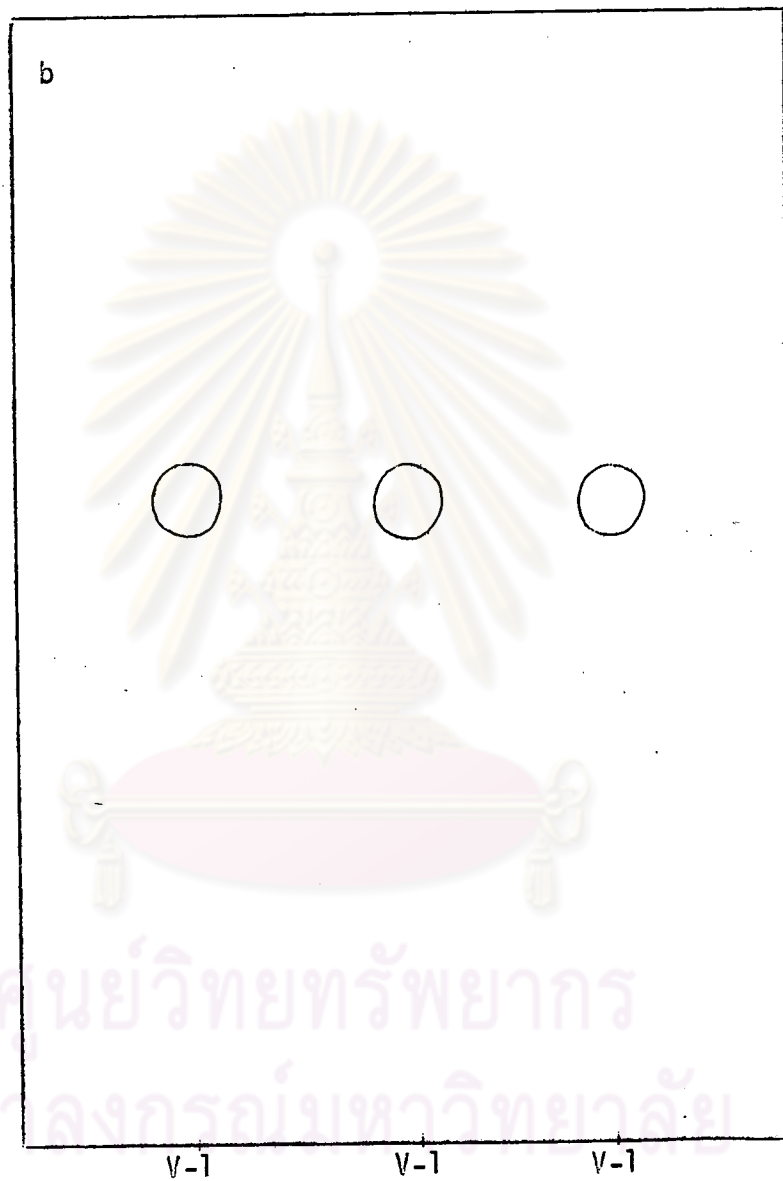


Figure 13. Thin layer chromatogram of alkaloid V-1 from the leaves of *Micromelum minutum* Seem.



Figure 14. Thin layer chromatogram of alkaloid V-1 from the leaves of *Micromelum minutum* Seem.

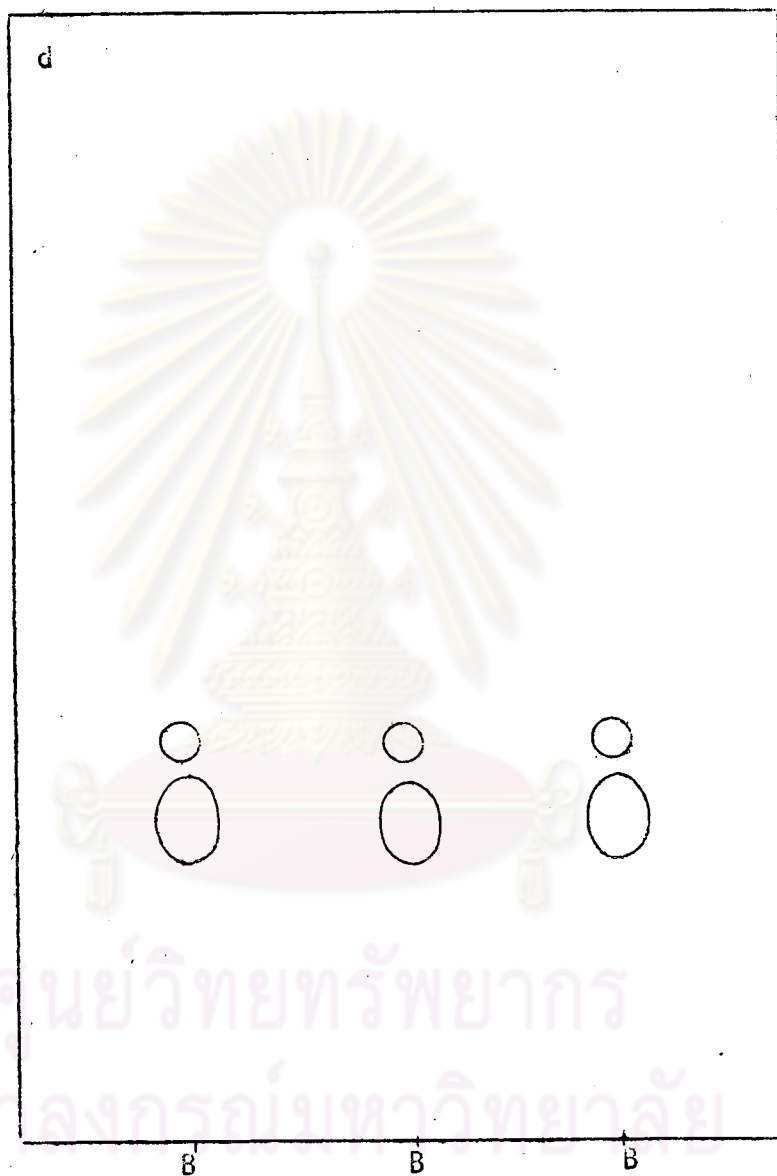


Figure 15. Thin layer chromatogram of alkaloids from the leaves of *Micromelum minutum* Seem.



Figure 16. Thin layer chromatogram of alkaloid V-1 from the leaves of *Micromelum minutum* Seem.

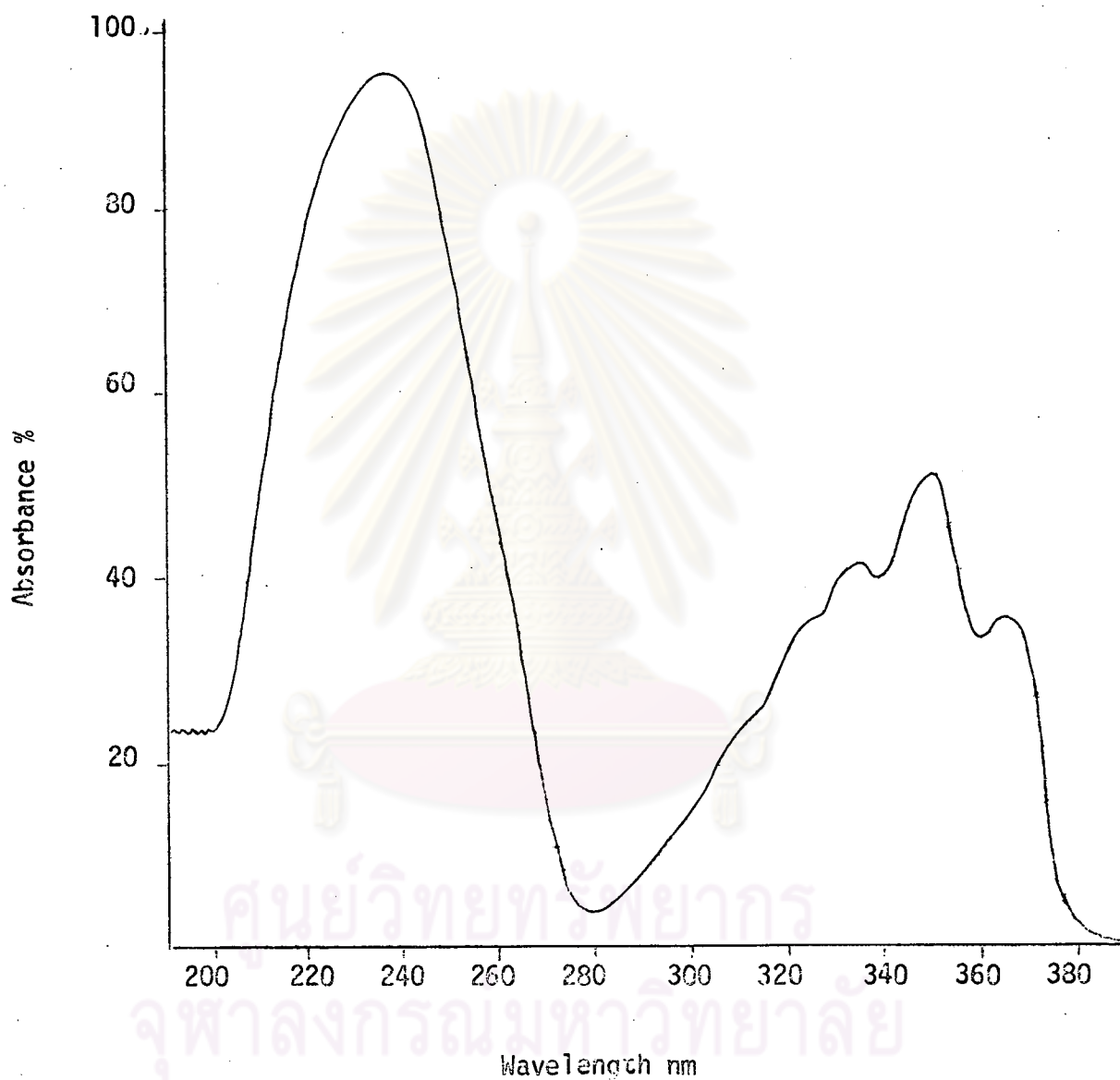


Figure 17. Ultraviolet absorption spectrum of alkaloid V-1 from the leaves of *Micromelum minutum* Seem. in ethanol.

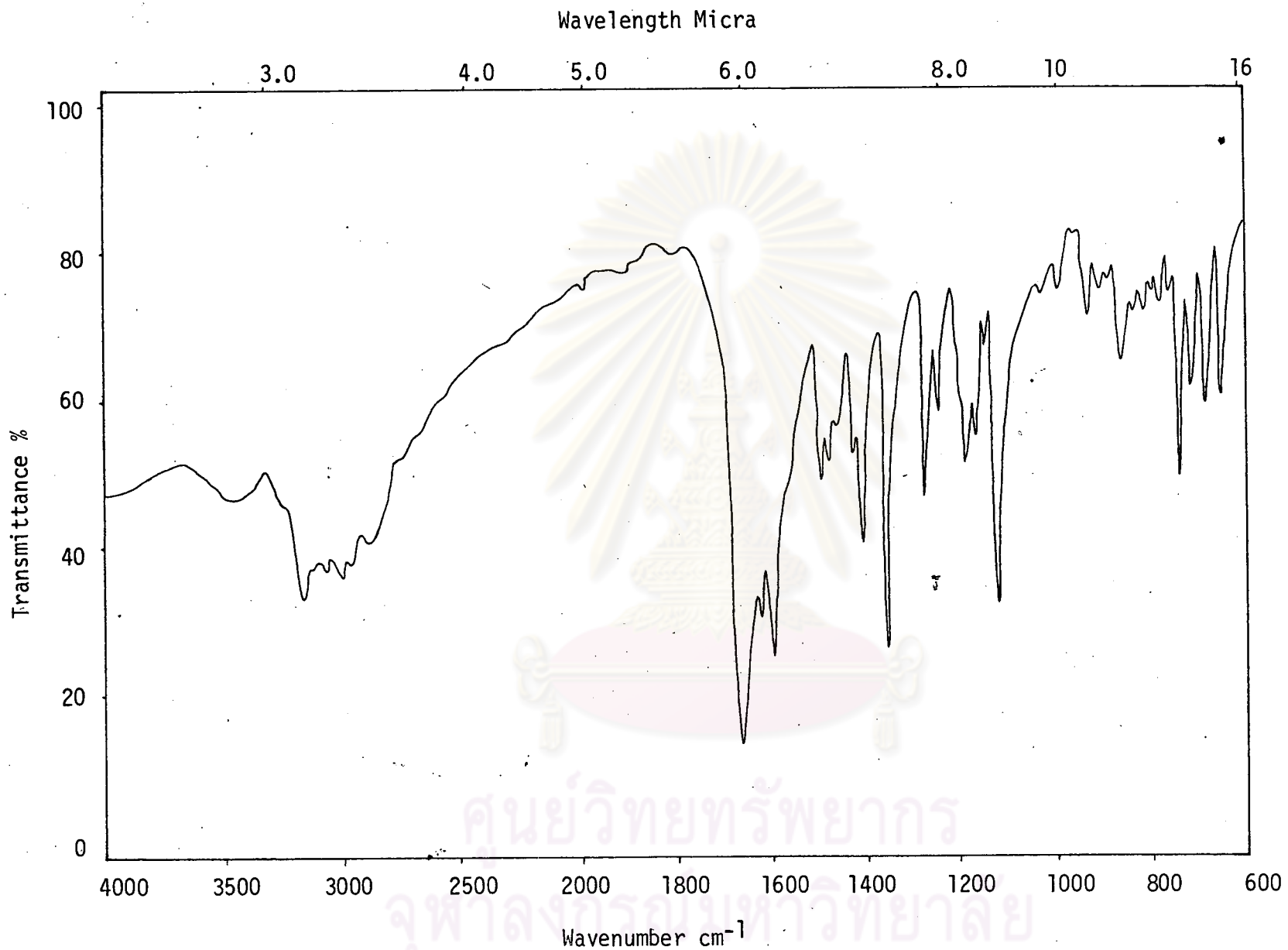


Figure 18. Infrared absorption spectrum of alkaloid V-1 from the leaves of *Micromelum minutum* Seem. in KBr disc.

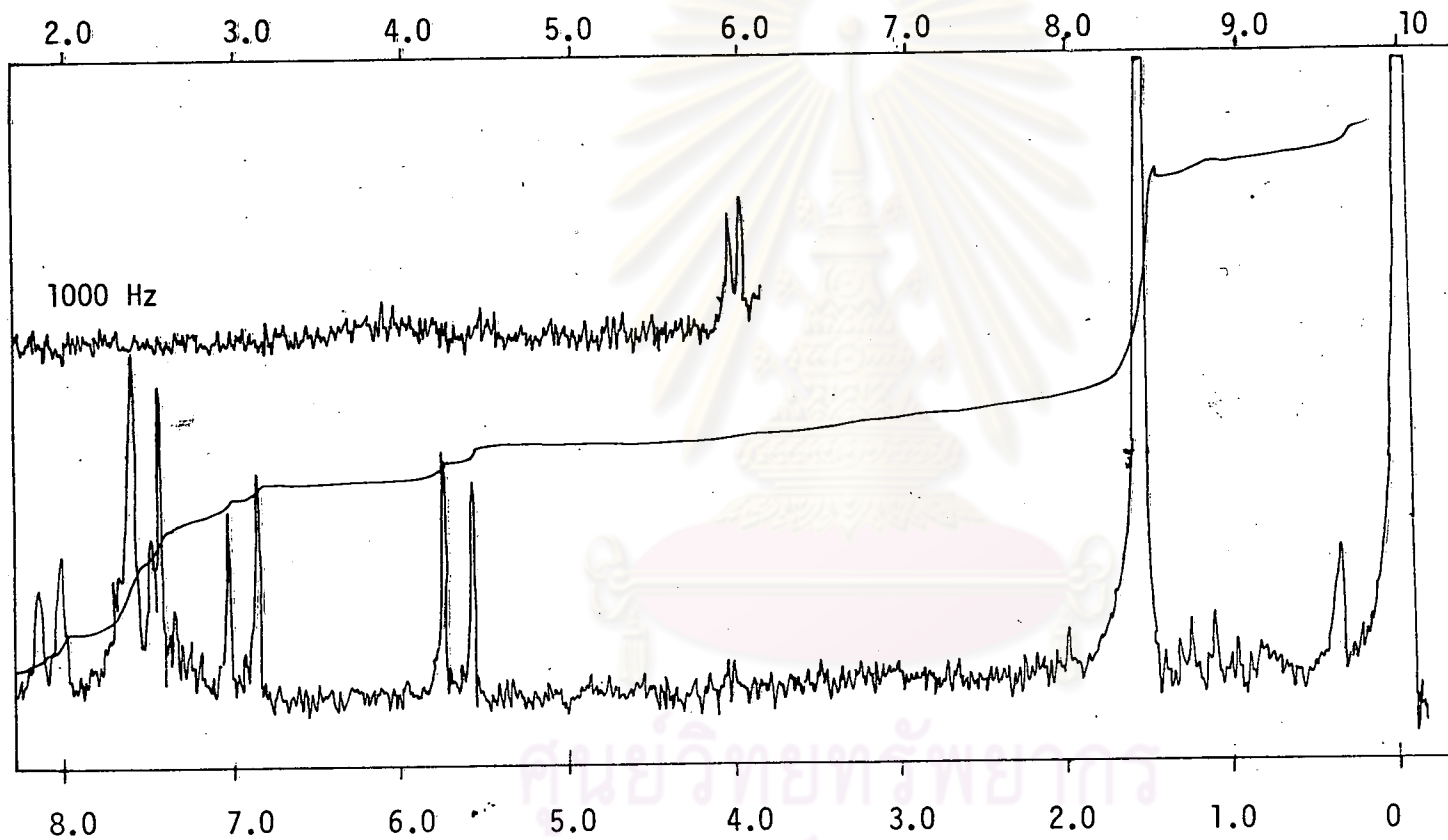


Figure 19. NMR spectrum of alkaloid V-1 from the leaves of *Micromelum minutum* Seem.

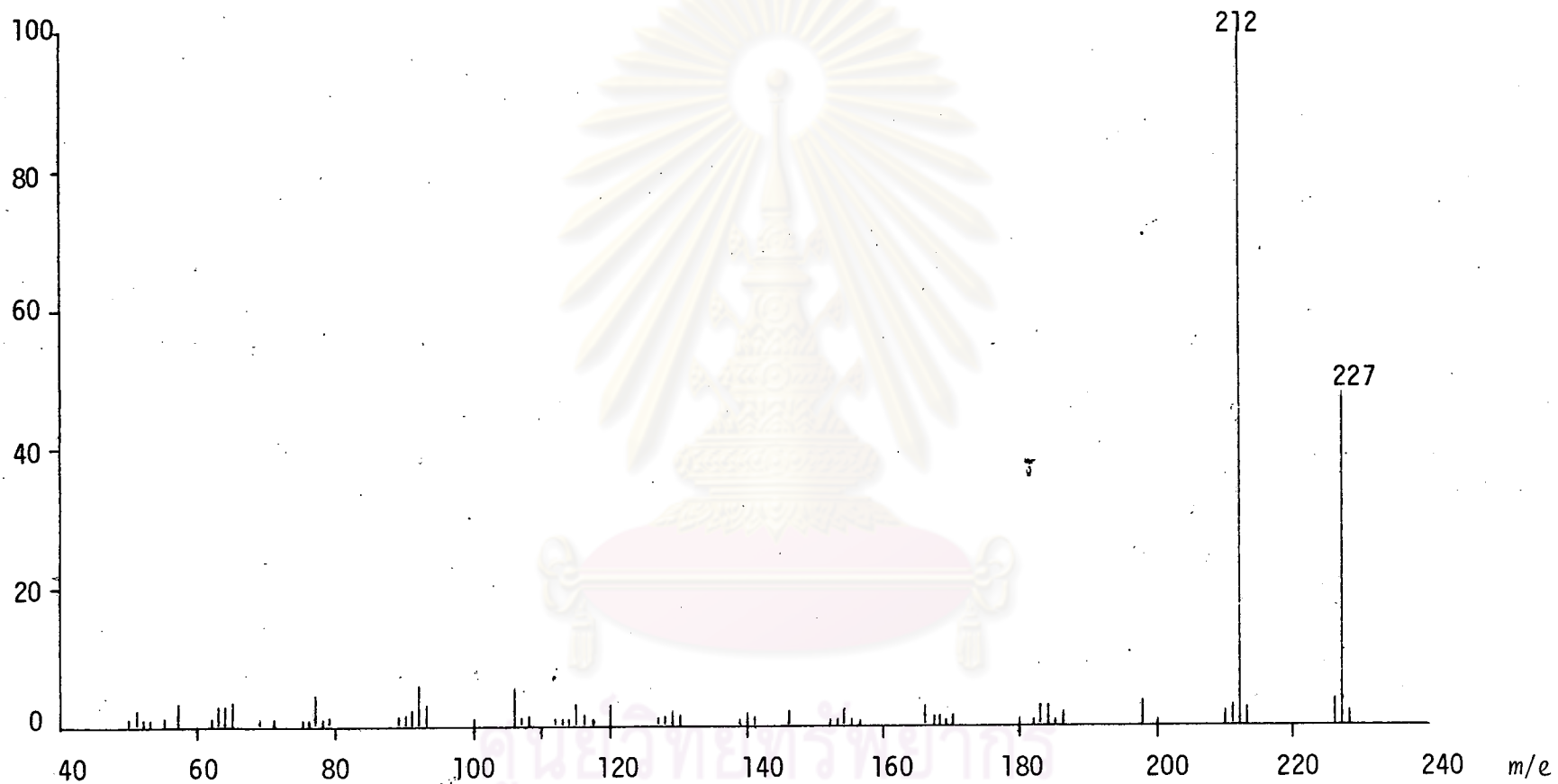


Figure 20. Mass spectrum of alkaloid V-1 from the leaves of *Micromelum minutum* Seem.





Flowers x 50

0 1 2 3 4 cm

หัตถ์คุด  
*Micromelum minutum* Seem.

## VITA

Miss Varisara Vaisitiroj was born on January 1, 1953 in Samutprakarn, Thailand. She got her degree in Bachelor of Science in 1974 from the Department of Botany, Faculty of Science, Chulalongkorn University.



ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย