

REFERENCES

- Aimi, N.; Yamanaka, E.; Endo, J.; Sakai, S., and Haginiwa, J.
 "Conversion of Oxindole Alkaloids into Indole Alkaloids."
Tetrahedron Lett. 11 (March 1972): 1801-1804.
- Aimi, N.; Yamanaka, E.; Shinma, N.; Fujiu, M.; Kurita, J.; Sakai, S.,
 and Haginiwa, J. "Studies on Plants Containing Indole Alkaloids.
 VI. Minor Bases of *Uncaria rhynchophylla* Miq." Chem. Pharm.
Bull. 25 (August 1977): 2067-2071.
- Au, T.Y.; Cheung, H.T., and Sternhell, S. "New Corynanthe Alkaloids
 from *Strychnos angustiflora*." J. Chem. Soc. Perkins Trans. I
 (1973): 13-16.
- Backer, C.A., and Bakhuizen van den Brink Jr., R.C. Flora of Java.
 Vol. II. Leiden: Rijksherbarium, 1965.
- Ban, Y.; Seto, M., and Oishi, T. "The Synthesis of 3-Spirooxindole
 Derivatives. VII. Total Synthesis of Alkaloids (\pm)-Rhynchophylline
 and (\pm)-Isorhynchophylline." Chem. Pharm. Bull. 23 (November
 1975): 2605-2613.
- Barger, G.; Dyer, E., and Sargent, L.J. "The Alkaloids of *Mitragyna*
rotundifolia." J. Org. Chem. 4 (September 1939): 418-427.
- Battersby, A.R.; Burnett, A.R., and Parsons, P.G. "Partial Synthesis
 and Isolation of Vincoside and Isovincoside: Biosynthesis of the
 Three Major Classes of Indole Alkaloids from the β -Carboline
 System." Chem. Comm. 21 (November 1968): 1282-1284.

Beckett, A.H.; Shellard, E.J.; Phillipson, J.D., and Lee, C.M.

"Alkaloids from *Mitragyna speciosa* Korth." J. Pharm. Pharmac.
17 (November 1965): 753-755.

_____ "The *Mitragyna* Species of Asia Part. VI. Oxindole Alkaloids from
the Leaves of *Mitragyna speciosa* Korth." Planta Med. 14 (1966 a):
266-276.

_____ "The *Mitragyna* Species of Asia Part. VII. Indole Alkaloids from
the Leaves of *Mitragyna speciosa* Korth." ibid. 14(1966 b):
277-288.

Beckett, A.H.; Shellard, E.J., and Tackie, A.N. "The *Mitragyna* Species
of Ghana: The Alkaloids of the Leaves of *Mitragyna stipulosa*
(DC.) O. Kuntze." J. Pharm. Pharmac. (Suppl.) 15 (December 1963 a)
: 158T-165T.

_____ "The *Mitragyna* Species of Ghana: The Alkaloids of the Leaves of
Mitragyna ciliata Aubr. et Pellegr." ibid. 15 (December 1963 b)
: 166T-169T.

_____ "The *Mitragyna* Species of Asia Part. IV. The Alkaloids of the
Leaves of *Mitragyna speciosa* Korth. Isolation of Mitragynine and
Speciofoline." Planta Med. 13 (May 1965): 241-246.

Beecham, A.F.; Hart, N.K.; Johns, S.R., and Lamberton, J.A. "A Study of
the C3/C7 Stereochemistry of Uncarines C, D, E and F by Circular
Dichroism." Tetrahedron Lett. 11 (March 1967 a): 991-993.

_____ "The Stereochemistry of Formosanine (Uncarine B) and Uncarine A."
Chem. Comm. 11 (June 1967 b): 535-536.

- Beecham, A.F.; Hart, N.K.; Johns, S.R., and Lamberton, J.A. "The Stereochemistry of Oxindole Alkaloids: Uncarines A, B (Formosanine), C (Pteropodine), D (Speciophylline), E (Isopteropodine), and F." Aust. J. Chem. 21 (February 1968): 491-504.
- Bentley, K.W. The Alkaloids. Vol. I Part II. 1st ed. New York: John Wiley & Sons, 1965.
- Bindra, J.S. "Oxindole Alkaloids." In The Alkaloids, pp. 84-119. Edited by Manske, R.H.F. New York: Academic Press, 1973.
- Blackstock, W.P.; Brown, R.T., and Lee, G.K. "Configuration at C3 in Vincoside." Chem. Comm. 16 (August 1971): 910-911.
- Burkill, I.H. A Dictionary of the Economic Products of the Malay Peninsula. Vol. II. Oxford: University Press, 1970.
- Chan, K.C. "Gambirdine and Isogambirdine, the Alkaloids from *Uncaria gambir* (Hunt.) Roxb." Tetrahedron Lett. 30 (June 1968): 3403-3406.
- _____ "The Stereochemistry of Pteropodine and Isopteropodine." Phytochem. 8 (January 1969): 219-222.
- Chan, K.C.; Morsingh, F., and Yeoh, G.B. "Alkaloids of *Uncaria pteropoda*. Isolation and Structures of Pteropodine and Isopteropodine." J. Chem. Soc. Section C (December 1966): 2245-2249.
- Clause, E.P.; Tyler, V.E., and Brady, L.R. Pharmacognosy. 6th ed. Philadelphia: Lea & Febiger, 1970.
- Craib, W.G. Florae Siamensis Enumeratio. Vol. II. Bangkok: Bangkok Time Press, 1932.

- Croquelouis, G.; Miet, C., and Poisson, J. "Oxindolic Alkaloids from *Uncaria orientalis* Guill." Ann. Pharm. Fr. 35 (1977): 417-418.
- Cu, N.A.; Goutarel, R., and Janot, M. Alcaloides du *Pseudocinchona africana* Aug. Chev." Bull. Soc. Chim. France 108 (1957): 1292-1294.
- De Silva, K.T.D.; Smith, G.N., and Warren, K.E.H. "Stereochemistry of Strictosidine." Chem. Comm. 16 (August 1971): 905-907.
- Field, E. "Mitragynine and Mitraversine, Two New Alkaloids from Species of *Mitragyna*." J. Chem. Soc. 119 (1921): 887-891.
- Finch, N., and Taylor, W.I. "The Conversion of Tetrahydro- β -Carboline Alkaloids into Oxindoles. The Structures and Partial Syntheses of Mitraphylline and Rhynchophylline." J. Amer. Chem. Soc. 84 (April 1962 a): 1318-1320.
- _____ "Oxidative Transformations of Indole Alkaloids. I. The Preparation of Oxindoles from Yohimbine; the Structures and Partial Syntheses of Mitraphylline, Rhynchophylline and Corynoxetine." ibid. 84 (October 1962 b): 3871-3877.
- Harada, M., and Ozaki, Y. "Effect of Indole Alkaloids from *Gardneria* Genus and *Uncaria* Genus on Neuromuscular Transmission in the Rat Limb in Situ." Chem. Pharm. Bull. 24 (January 1976): 211-214.
- Harada, M.; Ozaki, Y., and Sato, M. "Ganglion Blocking Effect of Indole Alkaloids Contained in *Uncaria* Genus and *Amsonia* Genus and Related Synthetic Compounds on the Rat Superior Cervical Ganglion in Situ." ibid. 22 (July 1974): 1372-1377.

- Hart, N.K.; Johns, S.R., and Lamberton, J.A. "Uncarine C, D (Speciophylline), E and F: C-3 and C-7 Epimeric Oxindoles Related to Tetrahydroalstonine." Chem. Comm. 2 (January 1967): 87-88.
- Hemingway, S.R.; Houghton, P.J.; Phillipson, J.D., and Shellard, E.J. "9-Hydroxyrhynchophylline-Type Oxindole Alkaloids." Phytochem. 14 (February 1975): 557-563.
- Hemingway, S.R., and Phillipson, J.D. "Alkaloids from S. American Species of *Uncaria* (Rubiaceae)." J. Pharm. Pharmac. (Suppl.) 26 (December 1974): 113p.
- Hendrickson, J.B., and Sims, J.J. "*Mitragyna* Alkaloids: The Structure of Stipulatine." Tetrahedron Lett. 14 (July 1963): 929-935.
- Henry, T.A. "The Alkaloids of *Picralima klaineana* Pierre. Part II." J. Chem. Soc. (1932): 2759-2768.
- _____ The Plant Alkaloids. 4th ed. London: J. & A. Churchill, 1949.
- Hochstein, F.A. "Alkaloids Of *Rauwolfia sellowii*." J. Amer. Chem. Soc. 77 (October 1955): 5744-5745.
- Houghton, P.J.; Lala, P.K.; Shellard, E.J., and Sarpong, K. "The Alkaloids of *Mitragyna stipulosa* (DC.) O.Kuntze." J. Pharm. Pharmac. 28 (January 1976): 664.
- Houghton, P.J., and Shellard, E.J. "*Mitragyna* Species of Asia Part XXVIII. Alkaloidal Pattern in *Mitragyna rotundifolia* from Burma." Planta Med. 26 (August 1974): 104-112.
- Ing, H.R., and Raison, C.G. "The Alkaloids of *Mitragyna speciosa* Part I. Mitragynine." J. Chem. Soc. Part I. (1939): 986-990.

- Irie, H.; Fukudome, J.; Ohmori, T., and Tanaka, J. "Synthesis of the Alkaloid, Oxogambirtannine." J. Chem. Soc., Chem. Comm. 2 (January 1975): 63.
- Jackson, A.H., and Smith, A.E. "Electrophilic Substitution in Indoles II. The Formation of 3,3-Spirocyclic Indole Derivatives from Tryptamines and Their Rearrangement to β -Carbolines." Tetrahedron. 24 (January 1968): 403-413.
- Johns, S.R., and Lamberton, J.A. "*Uncaria* Alkaloids: Two Stereoisomers of Mitrephylline from *Uncaria bernaysii* F.v. Muell. and *U. ferrea* DC." Tetrahedron Lett. 40 (October 1966): 4883-4888.
- Karrer, P., and Salomon, H. "Über zwei neue Alkaloide aus der Yohimberinde." Helv. Chim. Acta. 9 Part II (1962): 1059-1062.
- Karrea, P.; Schwyzer, R., and Flam, A. "Die Konstitution des Corynantheins and Dihydrocorynantheins." Helv. Chim. Acta. 35 Part I (1952): 851-862.
- Kompis, I.; Hesse, M., and Schmid, H. "An Approach to the Biogenetic Classification of Indole Alkaloids." Lloydia 34 (September 1971): 269-276.
- Lee, C.M.; Trager, W.F., and Beckett, A.H. "Corynantheidine-Type Alkaloids-II Absolute Configuration of Mitragynine, Speciociliatine, Mitraciliatine and Speciogynine." Tetrahedron 23 (January 1967): 375-385.
- Luckner, M. Secondary Metabolism in Plants and Animals. 1st ed. London: Chapman and Hall, 1972.
- Manske, R.H.F. "Sources of Alkaloids and Their Isolation." In The Alkaloids, pp. 1-11. Edited by Manske, R.H.F. New York: Academic Press, 1950.

- Manske, R.H.F. "Alkaloid of *Pseudocinchona* and Yohimbe." In ibid., pp. 693-724. Edited by Manske, R.H.F. New York: Academic Press, 1965.
- Mattoon, J.R. "The Biosynthesis of Amino Acid." In Biochem. of Natural Compounds, pp. 1-26. Edited by Bernfeld, P. London: Pergamon Press, 1963.
- Merlini, L.; Mondelli, R.; Nasini, G., and Hesse, M. "Gambirine, A New Alkaloid from *Uncaria gambir* Roxb." Tetrahedron Lett. 16 (April 1967 a): 1571-1574.
- _____ "Indole Alkaloids from Gambir; Structure of Gambirtannine, Oxogambirtannine and Dihydrogambirtannine." Tetrahedron 23 (July 1967 b): 3129-3145.
- _____ "The Structure of Roxburghines A-E, New Indole Alkaloids from an *Uncaria* sp." ibid. 26 (May 1970): 2259-2279.
- Merlini, L.; Nasini, G., and Haddock, R.E. "Indole Alkaloids from *Uncaria gambir*." Phytochem. 11 (March 1972): 1525-1526.
- Merlini, L.; Nasini, G., and Phillipson, J.D. "Structure and Synthesis of New Natural Heteroyohimbine N-oxides." Tetrahedron 28 (December 1972): 5971-5975.
- Morton, J.F. Major Medicinal Plants. Springfield: Charles C. Thomas Publisher, 1977.
- Müller, J.M. "Über die Alkaloide von *Rauwolfia ligustrina* R. & S. Raugustin, ein neues reserpinähnliches Alkaloid." Experientia 13 (1957): 479-481.
- Pelletier, S.W. Chemistry of the Alkaloids. New York: Van Nostrand Reinhold Company, 1969.
- Phillipson, J.D., and Hemingway, S.R. "Indole and Oxindole Alkaloids from *Uncaria bernaysi*." Phytochem. 12 (July 1973 a): 1481-1487.

- Phillipson, J.D., and Hemingway, S.R. "Alkaloids of *Uncaria longiflora*." ibid. 12 (September-December 1973 b): 2791-2794.
- _____ "Oxindole Alkaloids from *Uncaria macrophylla*." ibid. 12 (September-December 1973 c): 2795-2798.
- _____ "*Uncaria* Species as Sources of the Alkaloids Gambirine and the Roxburghines." J. Pharm. Pharmac. (Suppl.) 25 (December 1973 d): 143p.
- _____ "Chromatographic and Spectroscopic Methods for the Identification of Alkaloids from Herbarium Samples of the Genus *Uncaria*." J. Chromatog. 105 (February 1975): 163-178.
- _____ "Alkaloids of *Uncaria attenuata*, *U. orientalis* and *U. canescens*." Phytochem. 14 (August 1975): 1855-1863.
- Phillipson, J.D.; Hemingway, S.R.; Bisset, N.G., Houghton, P.J., and Shellard, E.J. "Angustine and Related Alkaloids from Species of *Mitragyna*, *Nauclea*, *Uncaria* and *Strychnos*." ibid. 13 (June 1974): 973-978.
- Phillipson, J.D.; Hemingway, S.R., and Ridsdale, C.E. "Alkaloids of *Uncaria*. Part V. Their Occurrence and Chemotaxonomy." Lloydia 14 (November-December 1978): 503-570.
- Phillipson, J.D.; Rungsiyakul, D., and Shellard, E.J. "N-oxide of the Oxindole Alkaloids, Isorhynchophylline, Rhynchophylline, Rhynchociline and Ciliaphylline." Phytochem. 12 (July 1973): 2043-2048.
- Phillipson, J.D., and Shellard, E.J. "The Correlation between the Stereochemistry of Some Indole and Oxindole Alkaloids and Their Behaviour on Thin Layer Chromatograms." J. Chromatog. 24 (September 1966): 84-92.

- Phillipson, J.D., and Shellard, E.J. "The Effect of Methoxy Substitution and Configuration on the Thin Layer Chromatographic Behaviour of Some Heteroyohimbine Alkaloids." ibid. 31 (October 1967): 427-438.
- _____ "The Thin Layer Chromatographic Behaviour of Some *E seco* Oxindole Alkaloids and Their Relationship with Indolizidine and Some Simple Oxindoles." ibid. 32 (February 1968): 692-703.
- Phillipson, J.D.; Tantivatana, P.; Tarpo, E., and Shellard, E.J.
"Hirsuteine and Mitrajavine from *Mitragyna hirsuta*." Phytochem. 12 (July 1973): 1507.
- Ponglux, D.; Tantivatana, P., and Pummangura, S. "Alkaloids from the Leaves of *Uncaria homomalla*." Planta Med. 31 (February 1977): 26-30.
- Ridsdale, C.E. "A Revision of *Mitragyna* and *Uncaria*." Blumea 24 (1978): 68-100.
- Robinson, T. The Biochemistry of Alkaloids. New York: Springer-Verlag, 1968.
- Robinson, R., and Thomas, A.F. "The Alkaloids of *Picralima nitida* Stapf, Th. and H. Durand. Part I The Structure of Akuammigine." J. Chem. Soc. (October 1954): 3479-3482.
- Rueffer, M.; Nagakura, N., and Zenk, M.H. "Strictosidine, the Common Precursor for Monoterpenoid Indole Alkaloids with 3 α and 3 β Configuration." Tetrahedron Lett. 18 (April 1978): 1593-1596.
- Rungsiyakul, D. "The Alkaloids of *Mitragyna tubulosa* Havil."
Doctoral dissertation, Chelsea College, University of London.
1973.

- Salkin, R.; Hosansky, N., and Jaret, R. "Leaf Alkaloids of *Rauwolfia nitida*." J. Pharm. Sci. 50 (December 1961): 1038-1041.
- Saxton, J.E. "The Indole Alkaloids." In The Alkaloids, pp. 4-199. Edited by Manske, R.H.F. New York:Academic Press, 1960.
- _____ "Alkaloids of *Mitragyna* and *Ouroouparia* Species." In ibid., pp. 59-91. Edited by Manske, R.H.F. New York: Academic Press, 1965 a.
- _____ "Alkaloids of *Alstonia* Species." In ibid., pp. 159-202. Edited by Manske, R.H.F. New York: Academic Press, 1965 b.
- _____ "Alkaloids of *Mitragyna* and *Ouroouparia* Species." In ibid., pp. 521-543. Edited by Manske, R.H.F. New York: Academic Press, 1968.
- _____ "Alkaloids of *Mitragyna* and Related Genera." In ibid., pp. 123-156. Edited by Manske, R.H.F. New York: Academic Press, 1973.
- Schlittler, E. "*Rauwolfia* Alkaloids with Special Reference to the Chemistry of Reserpine." In ibid., pp. 287-292. Edited by Manske, R.H.F. New York: Academic Press, 1965.
- Schultes, R.E. "Indole Alkaloids in Plant Hallucinogens." Planta Med. 29 (February 1976): 330-331.
- Seaton, J.C.; Nair, M.D.; Edwards, O.E., and Marion, L. "The Structure and Stereoisomerism of Three *Mitragyna* Alkaloids." Canad. J. Chem. 38 (July 1960): 1035-1042.
- Seaton, J.C.; Tondeur, R., and Marion, L. "The Structure of Mitraphylline." ibid. 36 (July 1958): 1031-1038.
- Shamma, M., and Richey, J.M. "The Stereochemistry of the Heteroyohimbine Alkaloids." J. Amer. Chem. Soc. 85 (August 1963): 2507-2512.

- Shamma, M.; Shine, R.J.; Kompis, I.; Sticzay, T.; Morsingh, F.; Poisson, J., and Pousset, J.L. "The Stereochemistry of the Pentacyclic Oxindole Alkaloids." ibid. 89 (March 1967): 1739-1740.
- Shavel, J., and Zinnes, H. "Oxindole Alkaloid. I. Oxidative Rearrangement of Indole Alkaloids to Their Oxindole Analogs." ibid. 84 (April 1962): 1320-1321.
- Shellard, E.J.; Beckett, A.H.; Tantivatana, P.; Phillipson, J.D., and Lee, C.H. "The *Mitragyna* Species of Asia Part VIII. The Alkaloids of the Leaves of *Mitragyna javanica* var. *microphylla* Koord and Valetton." Planta Med. 15 (1967): 245-254.
- Shellard, E.J., and Houghton, P.J. "The *Mitragyna* Species of Asia Part XIX. The Alkaloidal Pattern in *Mitragyna parvifolia* (Roxb.) Korth." ibid. 20 (1971): 82-89.
- _____ "The Conversion of *Pseudo* Heteroyohimbine Alkaloids to Oxindoles Part II. *in vivo* Studies in *Mitragyna parvifolia* (Roxb.) Korth." ibid. 21 (1972 a): 16-21.
- _____ "The *Mitragyna* Species of Asia Part XX. The Alkaloidal Pattern in *Mitragyna parvifolia* (Roxb.) Korth. from Burma." ibid. 21 (1972 b): 263-266.
- _____ "The *Mitragyna* Species of Asia Part XXI. The Distribution of Alkaloids in Young Plants of *Mitragyna parvifolia* Grown from Seeds Obtained from Ceylon." ibid. 21 (1972 c): 382-392.
- _____ "The *Mitragyna* Species of Asia Part XXII. The Distribution of Alkaloids in Young Plants of *Mitragyna parvifolia* Grown from Seeds Obtained from Uttar Pradesh State of India." ibid. 22 (August 1972 d): 97-102.

- Shellard, E.J., and Houghton, P.J. "The *Mitragyna* Species of Asia Part XXV. *In vivo* Studies, Using ^{14}C -Labelled Alkaloids in the Alkaloidal Pattern in Young Plants of *Mitragyna parvifolia* Grown from Seeds Obtained from Ceylon." *ibid.* 24 (August 1973): 341-352.
- _____ "The *Mitragyna* Species of Asia Part XXVI. Further *in vivo* Studies Using ^{14}C -Alkaloids in the Alkaloidal Pattern in Young Plants of *Mitragyna parvifolia* (Roxb.) Korth. Grown from Seeds Obtained from Sri-Lanka (Ceylon)." *ibid.* 25 (February 1974): 80-87.
- Shellard, E.J.; Houghton, P.J., and Lala, P.K. "Rotundifoline N-Oxides." *Phytochem.* 16 (July 1977): 1427-1429.
- Shellard, E.J.; Houghton, P.J., and Resha, M. "The *Mitragyna* Species of Asia Part XXXI. The Alkaloids of *Mitragyna speciosa* Korth. from Thailand." *Planta Med.* 34 (August 1978 a): 26-36.
- _____ "The *Mitragyna* Species of Asia Part XXXII. The Distribution of Alkaloids in Young Plants of *Mitragyna speciosa* Korth. Grown from Seeds Obtained from Thailand." *ibid.* 34 (November 1978 b): 253-263.
- Shellard, E.J., and Lala, P.K. "The Alkaloids of *Mitragyna robrostipulata* (Schum.) Havil." *ibid.* 33 (February 1978): 63-69.
- Shellard, E.J., and Phillipson, J.D. "The *Mitragyna* Species of Asia Part I. The Alkaloids of the Leaves of *Mitragyna rotundifolia* (Roxb.) O. Kuntze." *ibid.* 12 (March 1964 a): 27-32.
- _____ "The *Mitragyna* Species of Asia Part II. The Alkaloids of the Leaves of *Mitragyna parvifolia* (Roxb.) Korth." *ibid.* 12 (June 1964 b): 160-165.

- Shellard, E.J.; Phillipson, J.D., and Gupta, D. "The *Mitragyna* Species of Asia Part XI. The Alkaloids of the Leaves of *Mitragyna parvifolia* (Roxb.) Korth. Obtained from the Maharashtra State of India." ibid. 16 (1968 a): 20-28.
- _____ "The *Mitragyna* Species of Asia Part XIII. The Alkaloids of the Leaves of *Mitragyna parvifolia* (Roxb.) Korth. Obtained from India." ibid. 16 (1968 b): 436-445.
- _____ "The *Mitragyna* Species of Asia Part XIV. The Alkaloids of the Leaves of *Mitragyna parvifolia* (Roxb.) Korth. Obtained from Burma, Cambodia and Ceylon." ibid. 17 (1969 a): 51-58.
- _____ "The *Mitragyna* Species of Asia Part XV. The Alkaloids from the Bark of *Mitragyna parvifolia* (Roxb.) Korth. and a Possible Biogenetic Route for the Oxindole Alkaloids." ibid. 17 (1969 b) 146-163.
- Shellard, E.J.; Phillipson, J.D., and Sarpong, K. "Rhynchophylline and Isorhynchophylline N-oxides from Species of *Mitragyna*." Phytochem. 10 (October 1971): 2505-2511.
- Shellard, E.J., and Rungsiyakul, D. "The *Mitragyna* Species of Asia Part XXIII. The Alkaloids of the Leaves of *Mitragyna tubulosa* Havil." Planta Med. 23 (February 1973): 221-225.
- Shellard, E.J., and Sarpong, K. "The Alkaloids of the Leaves of *Mitragyna inermis* (Willd.) O. Kuntze." J. Pharm. Pharmac. (Suppl.) 21 (December 1969): 1135-1175.
- _____ "The Alkaloidal Pattern in the Leaves, Stem Bark and Root Bark of *Mitragyna* Species from Ghana." ibid. 22 (December 1970): 345-395.

- Shellard, E.J., and Sarpong, K. "The Conversion of *Pseudo* Heteroyohimbine Alkaloids to Oxindoles." Planta Med. 20 (1971 a): 167-171.
- _____. "The Structure of Isomitrajavine." Tetrahedron. 27 (May-June 1971 b): 1725-1729.
- Shellard, E.J.; Tantivatana, P., and Beckett, A.H. "The *Mitragyna* Species of Asia Part X. The Alkaloids of the Leaves of *Mitragyna hirsuta* Havil." Planta Med. 15 (1967): 366-370.
- Supavita, T. Instructor in the Department of Pharmaceutical Botany, Faculty of Pharmaceutical Science, Chulalongkorn University.
Interview, 30 March 1979.
- Swan, G.A. An Introduction to the Alkaloids. 1st ed. Oxford: Blackwell Scientific Publications, 1967.
- Tantivatana, P.; Ponglux, D.; Jirawongse, V., and Silpvisavanont, Y.
"Alkaloids from *Uncaria quadrangularis.*" Planta Med. 35 (January 1979): 92-96.
- Taylor, W.I. Indole Alkaloids. 1st ed. London: Pergamon Press, 1966.
- Thailand. Royal Forest Department. Siamese Plant Names. 1st ed. Bangkok: Suri Ratna Press, 1948.
- Trager, W.F.; Lee, C.M., and Beckett, A.H. "Corynantheidine-Type Alkaloids I. Establishment of Physical Criteria for the *normal*, *pseudo*, *allo* and *epiallo* Configuration by Conformational Analysis." Tetrahedron. 23 (January 1967): 365-374.
- Trager, W.F.; Lee, C.M.; Phillipson, J.D., and Beckett, A.H. "The Absolute Configuration of Paynantheine and Hirsutine." ibid. 23 (February 1967): 1043-1047.

- Trager, W.F.; Lee, C.M.; Phillipson, J.D.; Haddock, R.E.; Dwuma-Badu, D., and Beckett, A.H. "Configurational Analysis of Rhynchophylline-Type Oxindole Alkaloids. The Absolute Configuration of Ciliaphylline, Rhynchociline, Specionoxeine, Isospecionoxeine, Rotundifoline and Isorotundifoline." ibid. 24 (January 1968): 523-543.
- Trager, W.F.; Phillipson, J.D., and Beckett, A.H. "Chemical Confirmation for the Configurations Assigned to the Indole Alkaloids, Speciogynine, Speciociliatine, Mitraciliatine and Hirsutine." ibid. 24 (March 1968): 2681-2685.
- Uphof, J.C.Th. Dictionary of Economic Plants. 2nd ed. Lehre: J. Cramer Publisher, 1968.
- Weisenborn, F.L., and Diassi, P.A. "The Reaction of *Rawolfia* Alkaloids with Mercuric Acetate. Conversion of 3-Isoreserpine to reserpine." J. Amer. Chem. Soc. 78 (May 1956): 2022-2023.
- Wenkert, E., and Roychaudhuri, D.K. "3-Dehydro Derivative of Some Indole Alkaloids." J. Org. Chem. 21 (July-December 1956): 1315-1318.
- _____ "Oxidation-Reduction Studies in the Realm of Indole Alkaloids." J. Amer. Chem. Soc. 80 (April 1958): 1613-1619.
- Willis, J.C. A Dictionary of the Flowering Plants and Ferns. 6th ed. Cambridge: University Press, 1960.
- Yeoh, G.B.; Chan, K.C., and Morsingh, F. "Pteropodine and Isopteropodine, the Alkaloids from *Uncaria pteropoda*." Tetrahedron Lett. 9 (March 1966): 931-938.

APPENDIX

Silica gel G / chloroform : acetone (5:4)

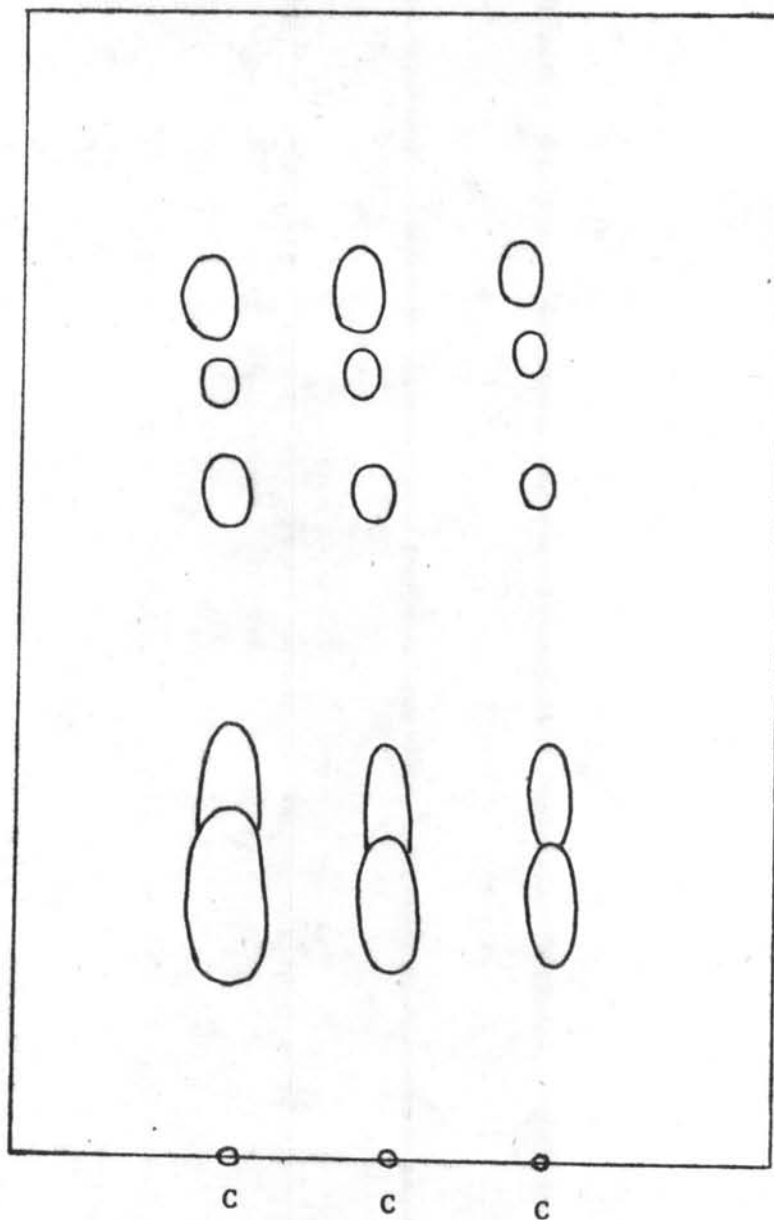


Figure I. Thin layer chromatogram of crude alkaloids (C).

Silica gel G / chloroform : ethyl alcohol (95:5)

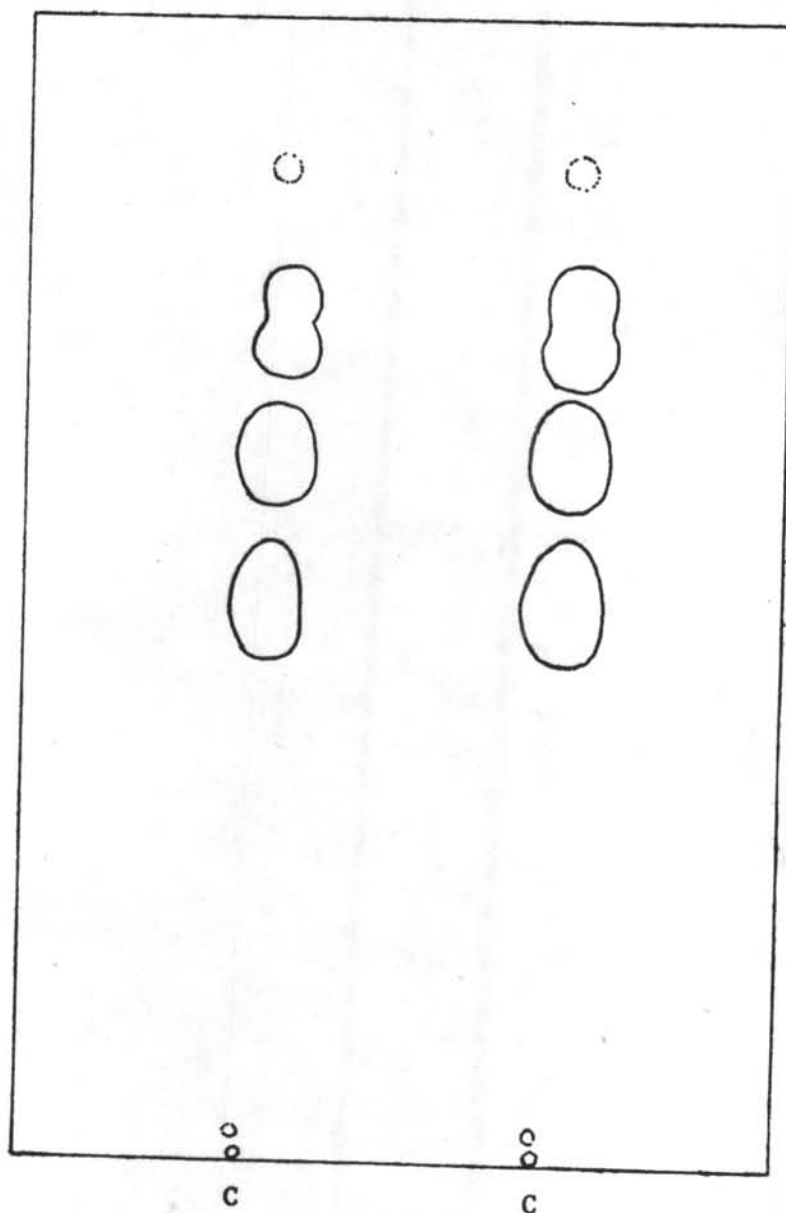


Figure II. Thin layer chromatogram of crude alkaloids (C).

Silica gel G / diethyl ether : ethyl acetate (1:1)

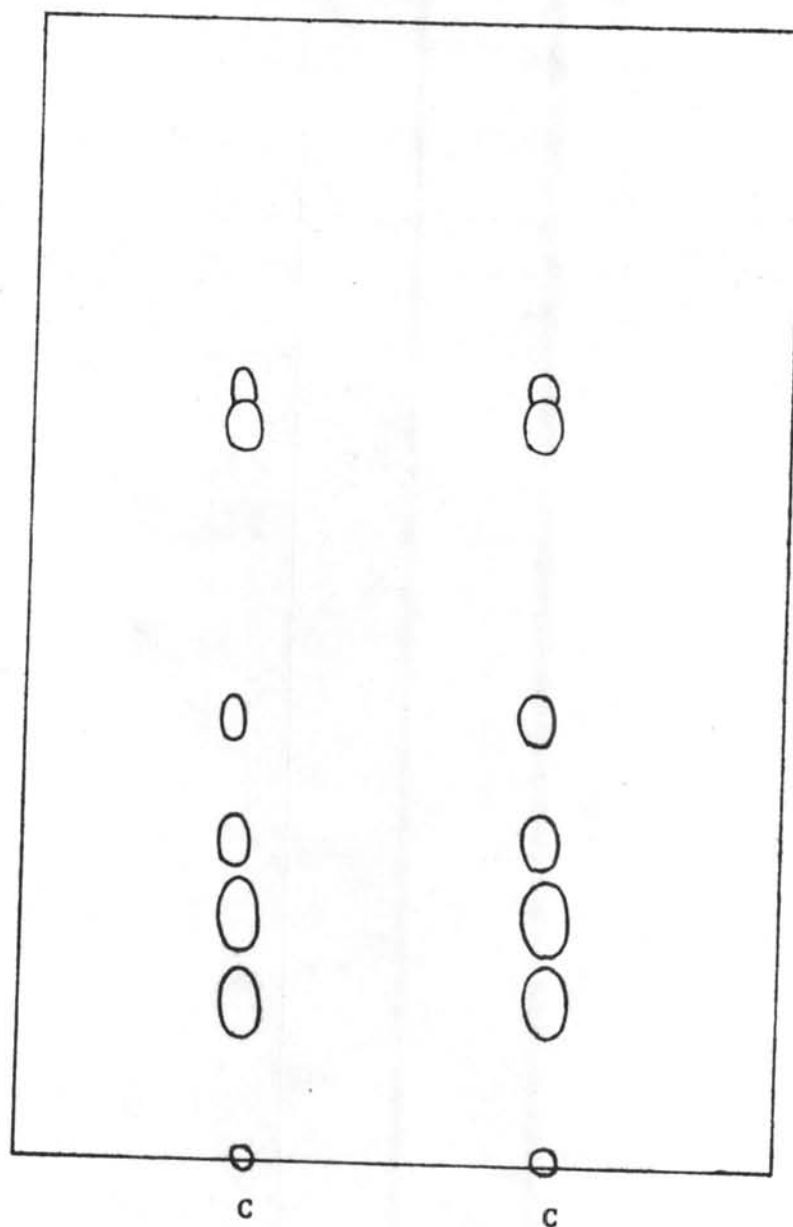


Figure III. Thin layer chromatogram of crude alkaloids (C).

Silica gel G / ethyl acetate

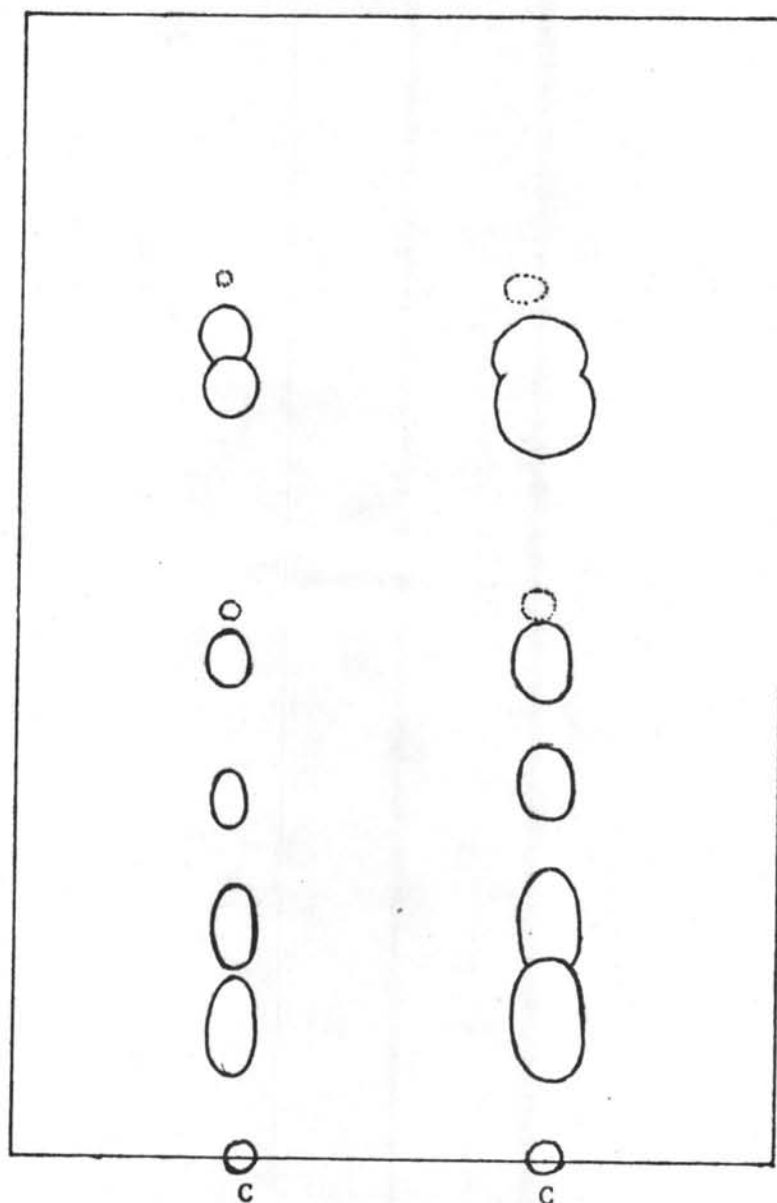


Figure IV. Thin layer chromatogram of crude alkaloids (C).

Silica gel G / diethyl ether

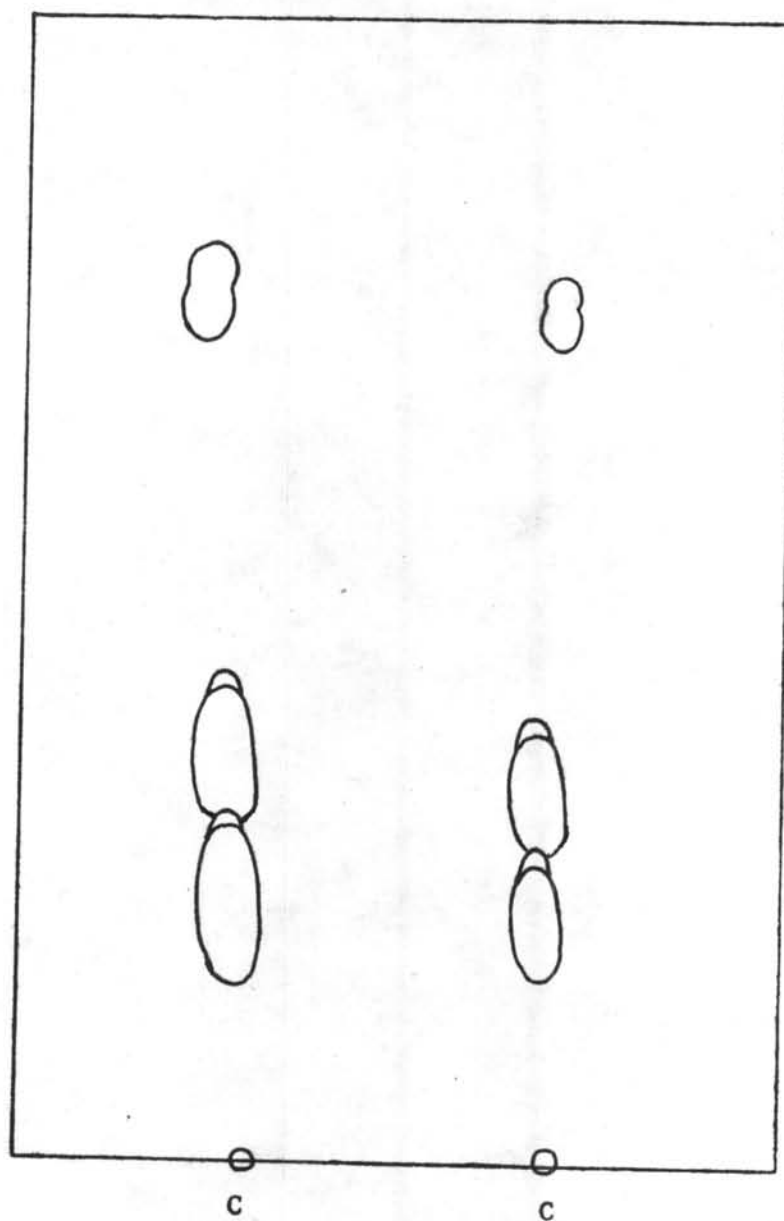


Figure V. Thin layer chromatogram of crude alkaloids (C).

Aluminium oxide G / chloroform : acetone (5:4)

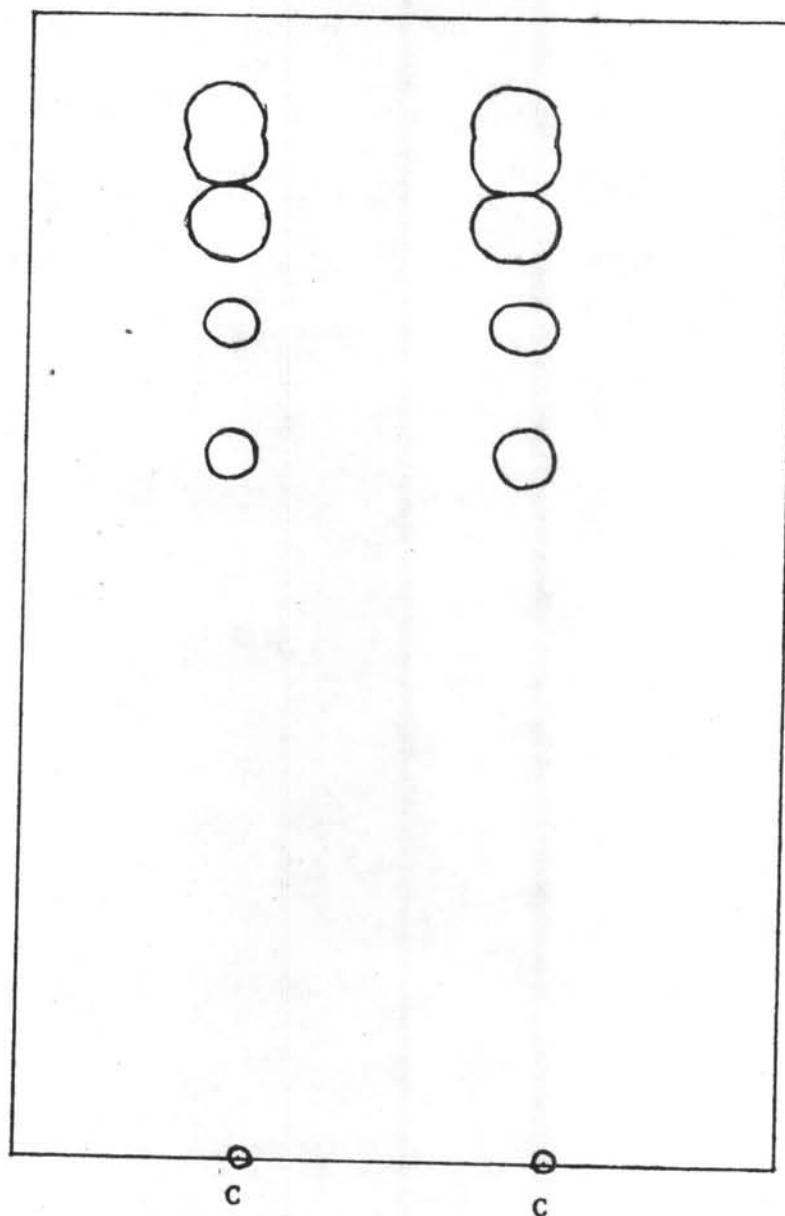


Figure VI. Thin layer chromatogram of crude alkaloids (C).

Aluminium oxide G / ethyl acetate

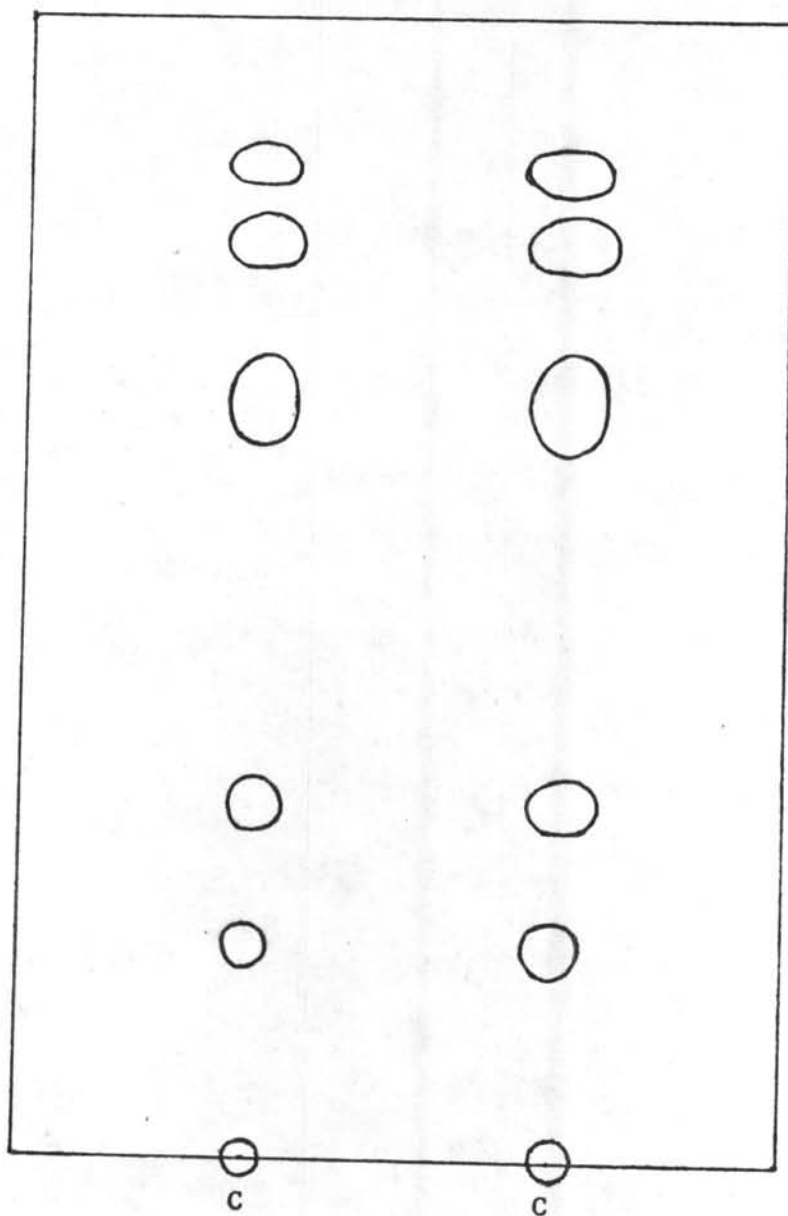


Figure VII. Thin layer chromatogram of crude alkaloids (C).

Silica gel G / diethyl ether (developing twice)

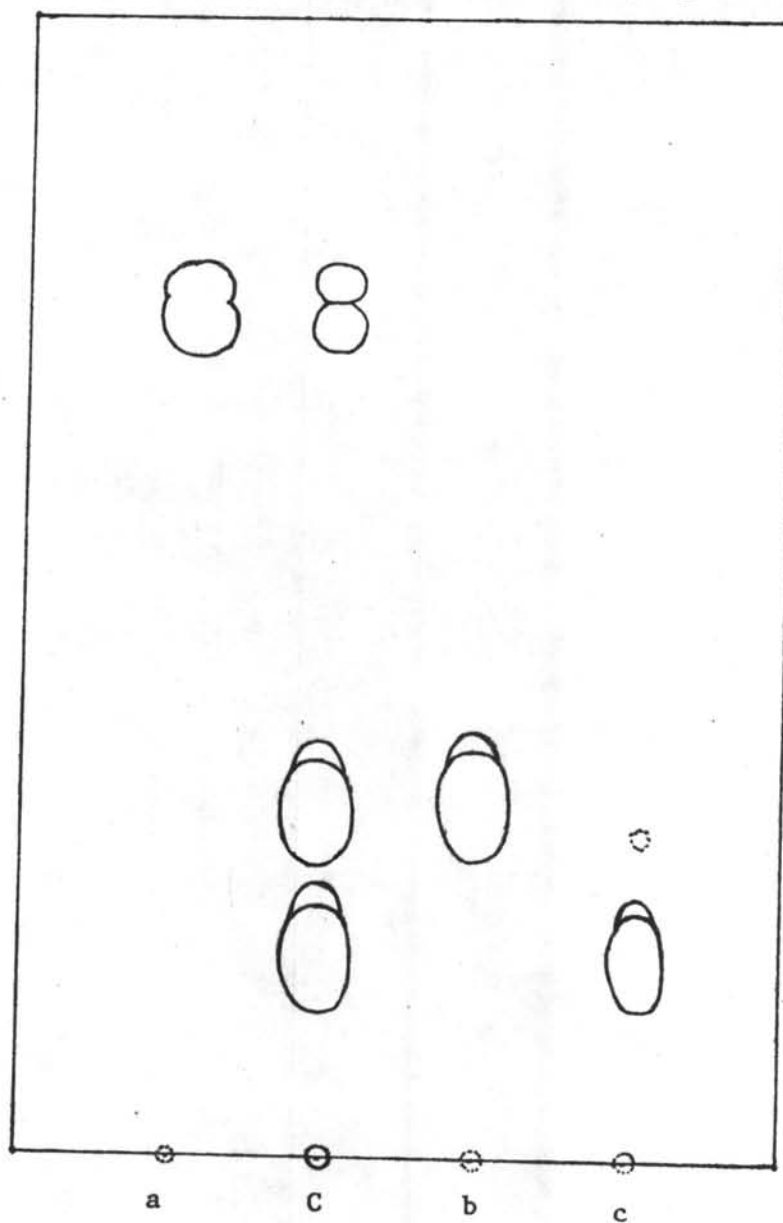


Figure VIII. Thin layer chromatogram of fraction A (a),
crude alkaloid (C), fraction B (b), fraction C (c).

Silica gel G / chloroform : acetone (5:4)

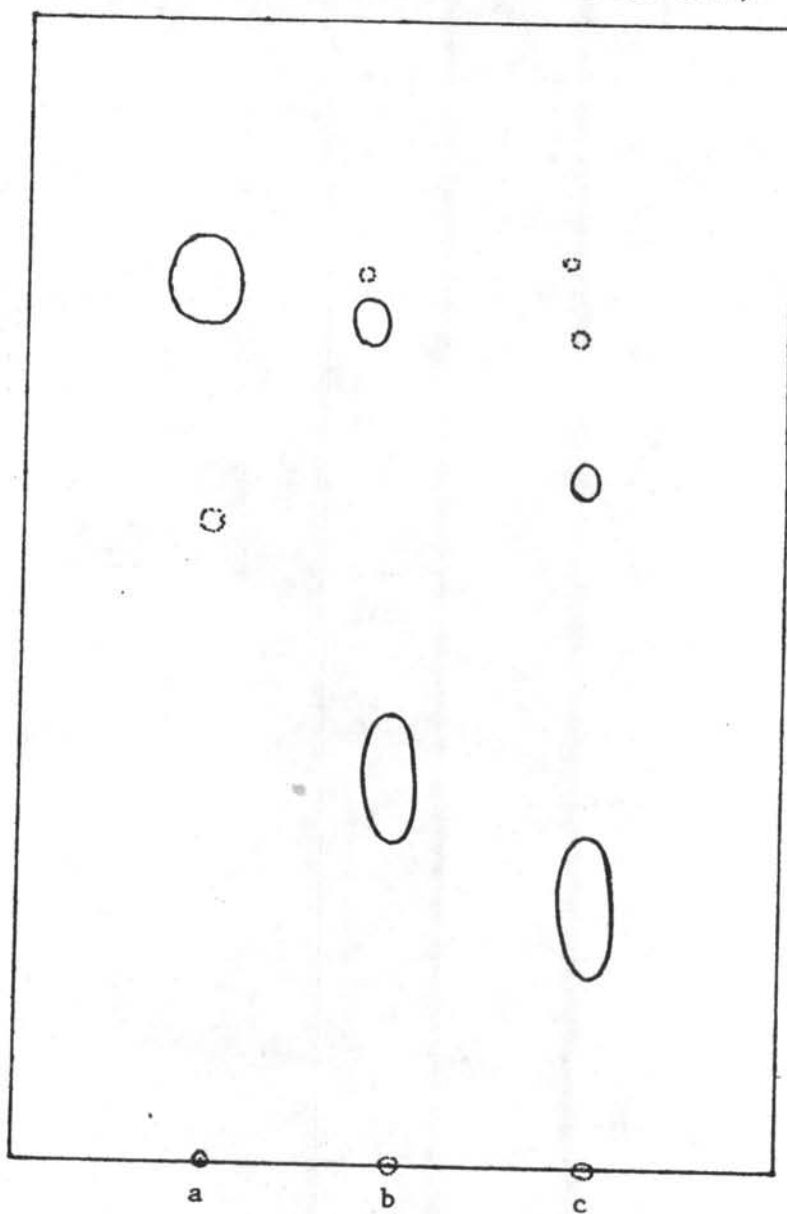


Figure IX. Thin layer chromatogram of fraction A (a),
fraction B (b), fraction C (c).

Silica gel G / ethyl acetate

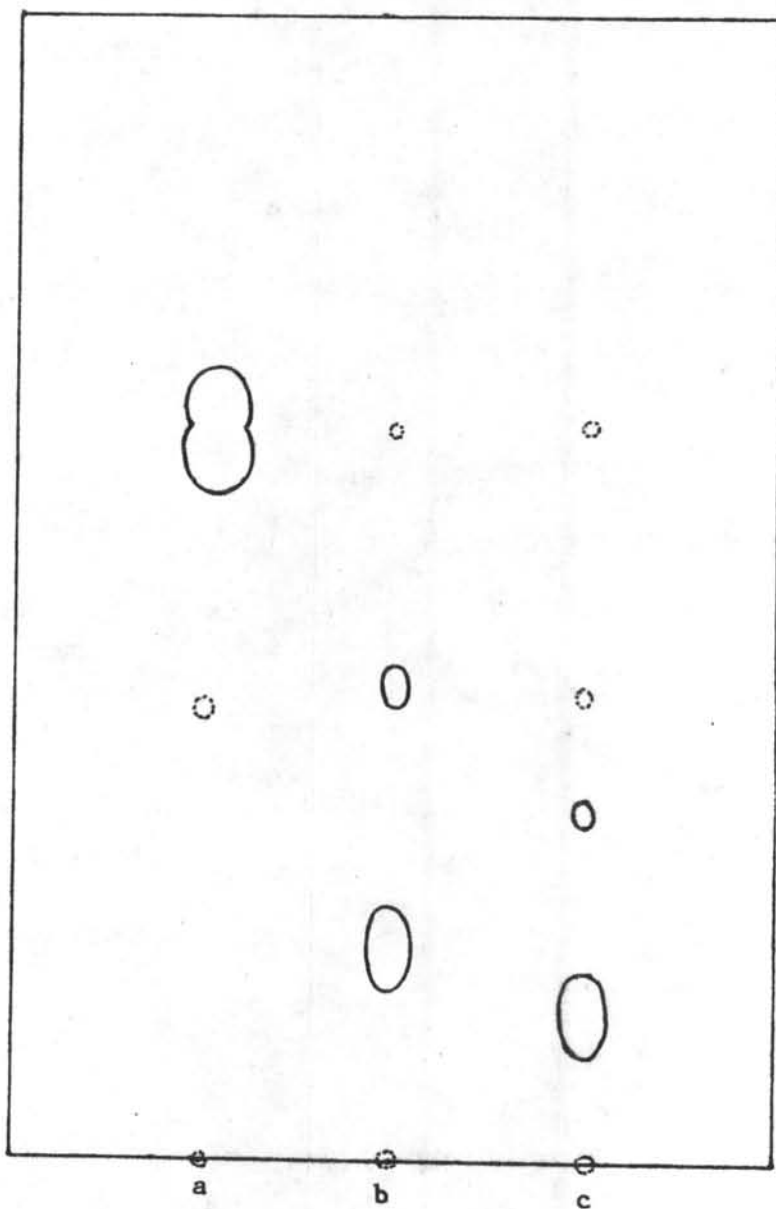


Figure X. Thin layer chromatogram of fraction A (a),
fraction B (b), fraction C (c).

Silica gel G / chloroform : acetone (5:4)

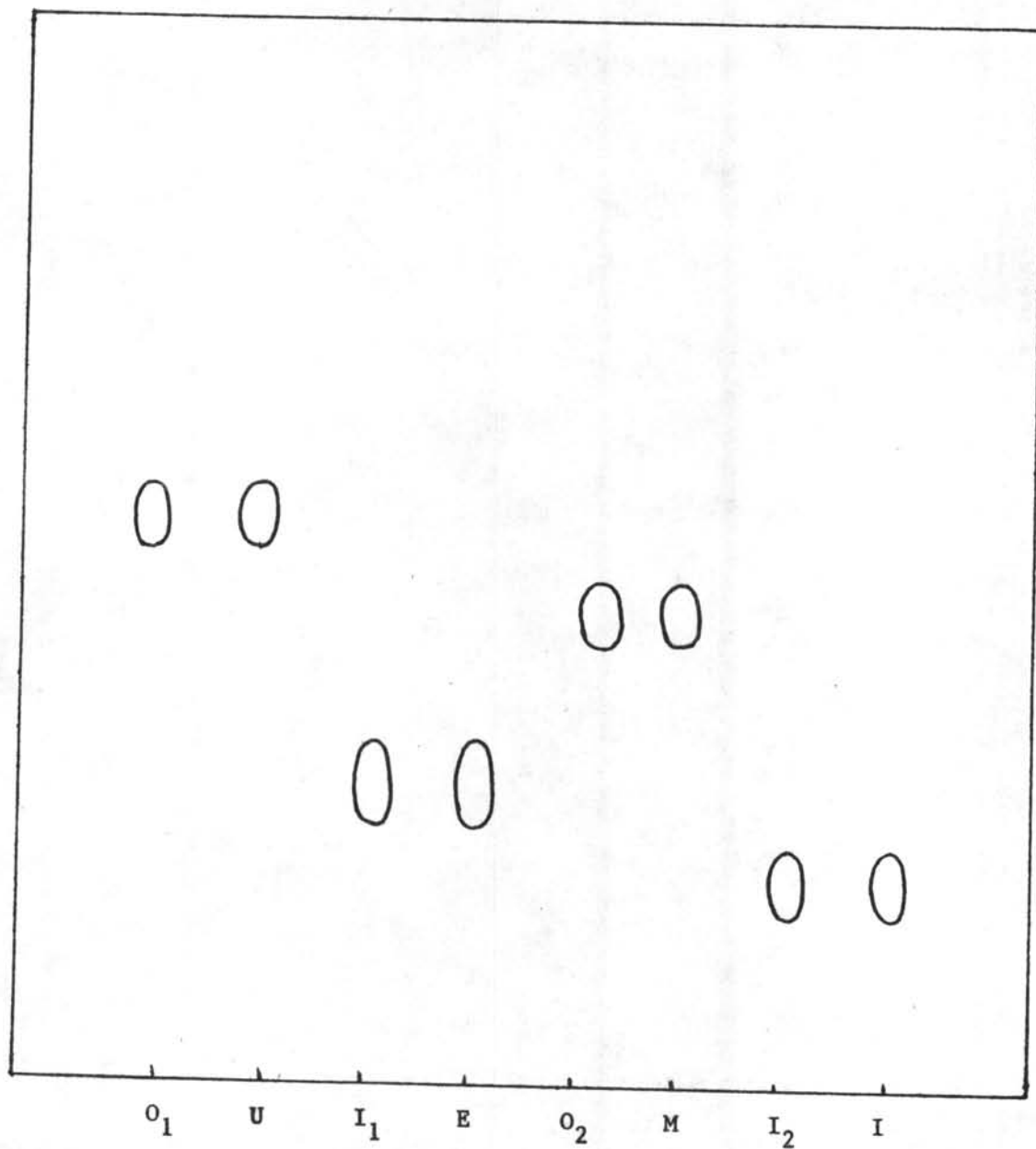


Figure XI. Thin layer chromatogram of O_1 (isolated uncarine B), U (uncarine B), I_1 (isolated 19-epi-3-isoajmalicine), E (19-epi-3-isoajmalicine), O_2 (isolated mitraphylline), M (mitraphylline), I_2 (isolated 3-isoajmalicine), I (3-isoajmalicine).

Silica gel G / chloroform : ethyl alcohol (95:5)

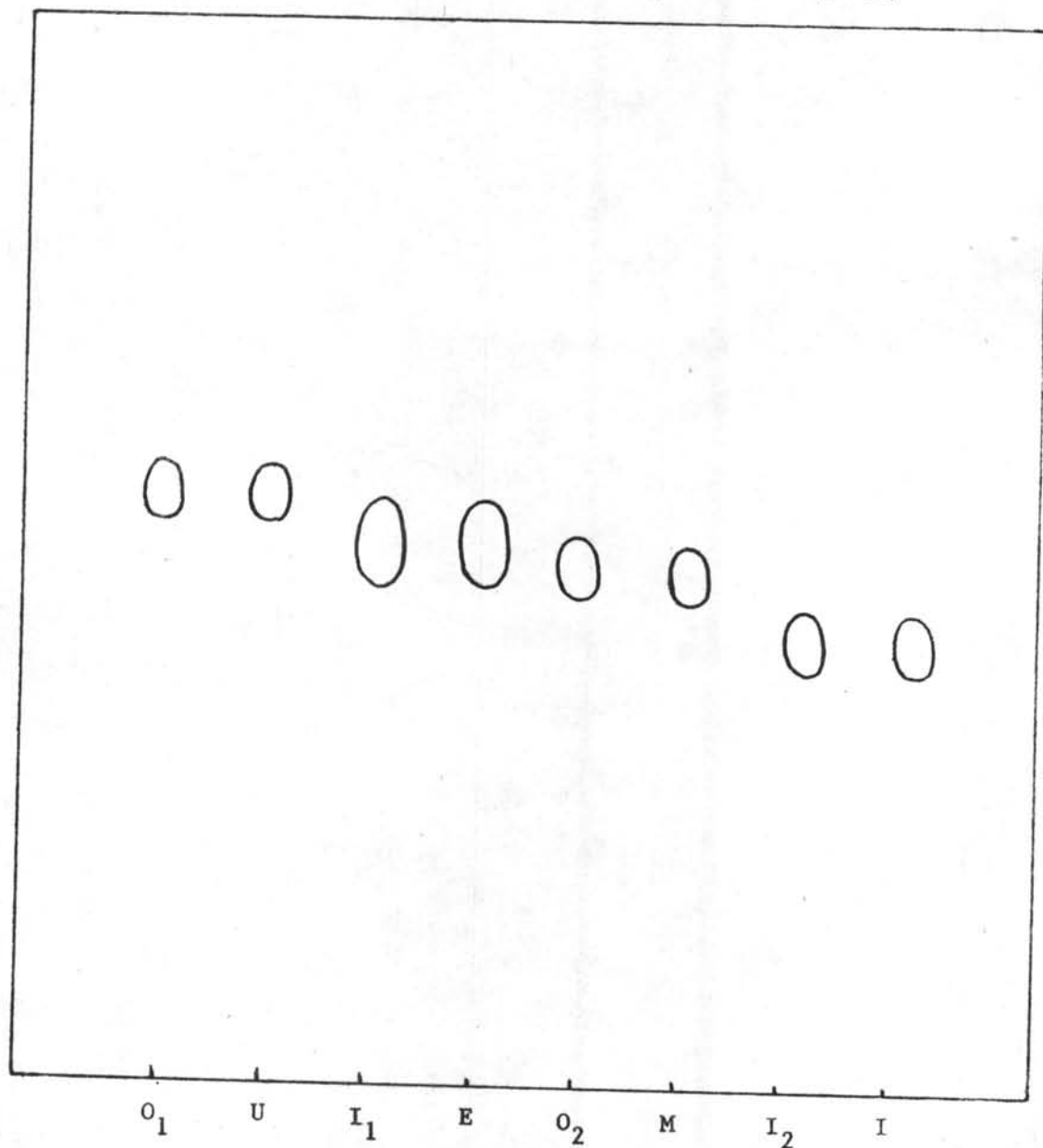


Figure XII. Thin layer chromatogram of O₁ (isolated uncarine B), U (uncarine B), I₁ (isolated 19-epi-3-isoajmalicine), E (19-epi-3-isoajmalicine), O₂ (isolated mitraphylline), M (mitraphylline), I₂ (isolated 3-isoajmalicine), I (3-isoajmalicine).

Silica gel G / diethyl ether : ethyl acetate (1:1)

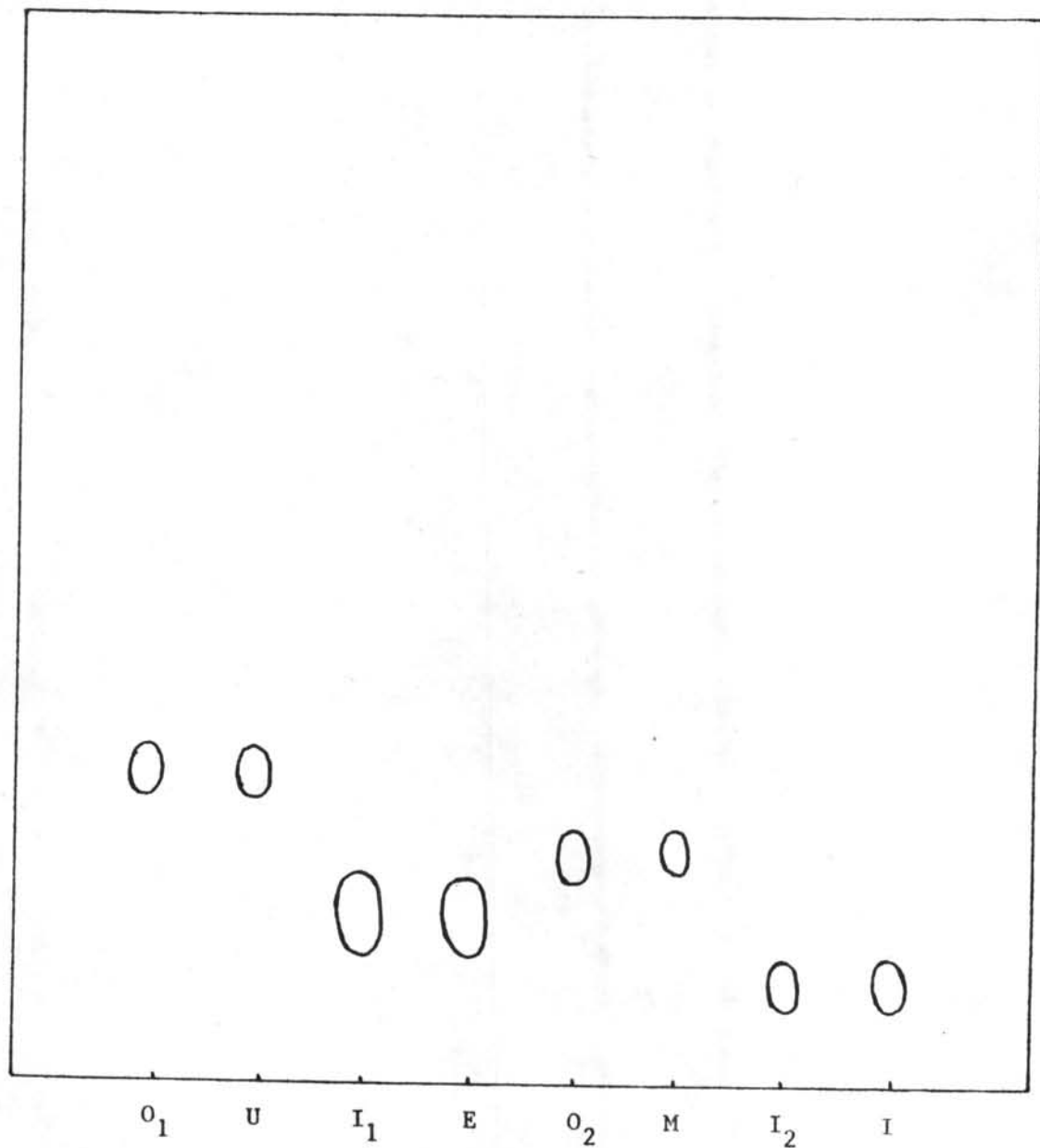


Figure XIII. Thin layer chromatogram of O₁ (isolated uncarine B), U (uncarine B), I₁ (isolated 19-epi-3-isoajmalicine), E (19-epi-3-isoajmalicine), O₂ (isolated mitraphylline), M (mitraphylline), I₂ (isolated 3-isoajmalicine), I (3-isoajmalicine).

Silica gel G / ethyl acetate : isopropyl alcohol :
strong solution of ammonium hydroxide (100:2:1)

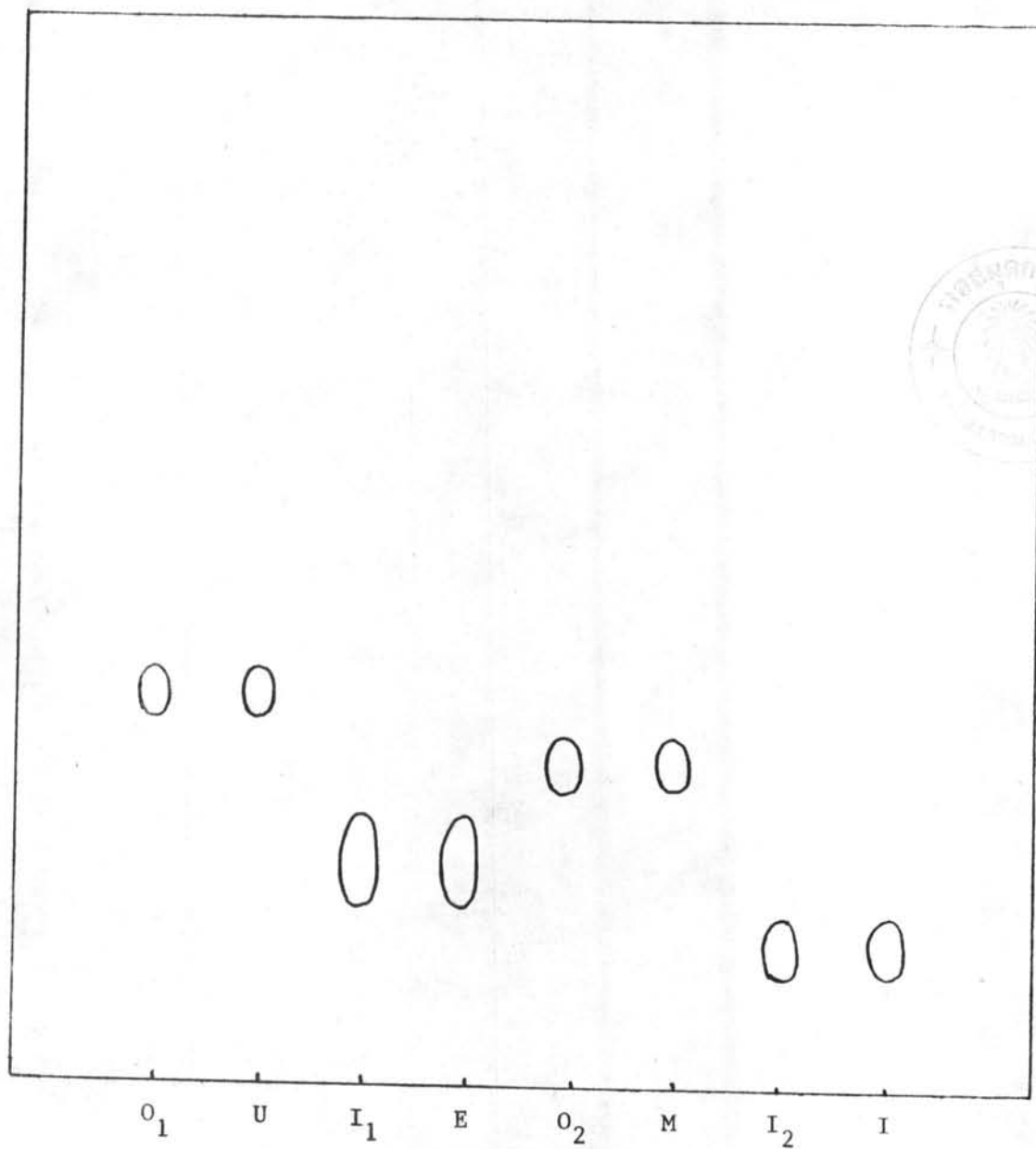


Figure XIV. Thin layer chromatogram of O₁ (isolated uncarine B), U (uncarine B), I₁ (isolated 19-epi-3-isoajmalicine), E (19-epi-3-isoajmalicine), O₂ (isolated mitraphylline), M (mitraphylline), I₂ (isolated 3-isoajmalicine), I (3-isoajmalicine).

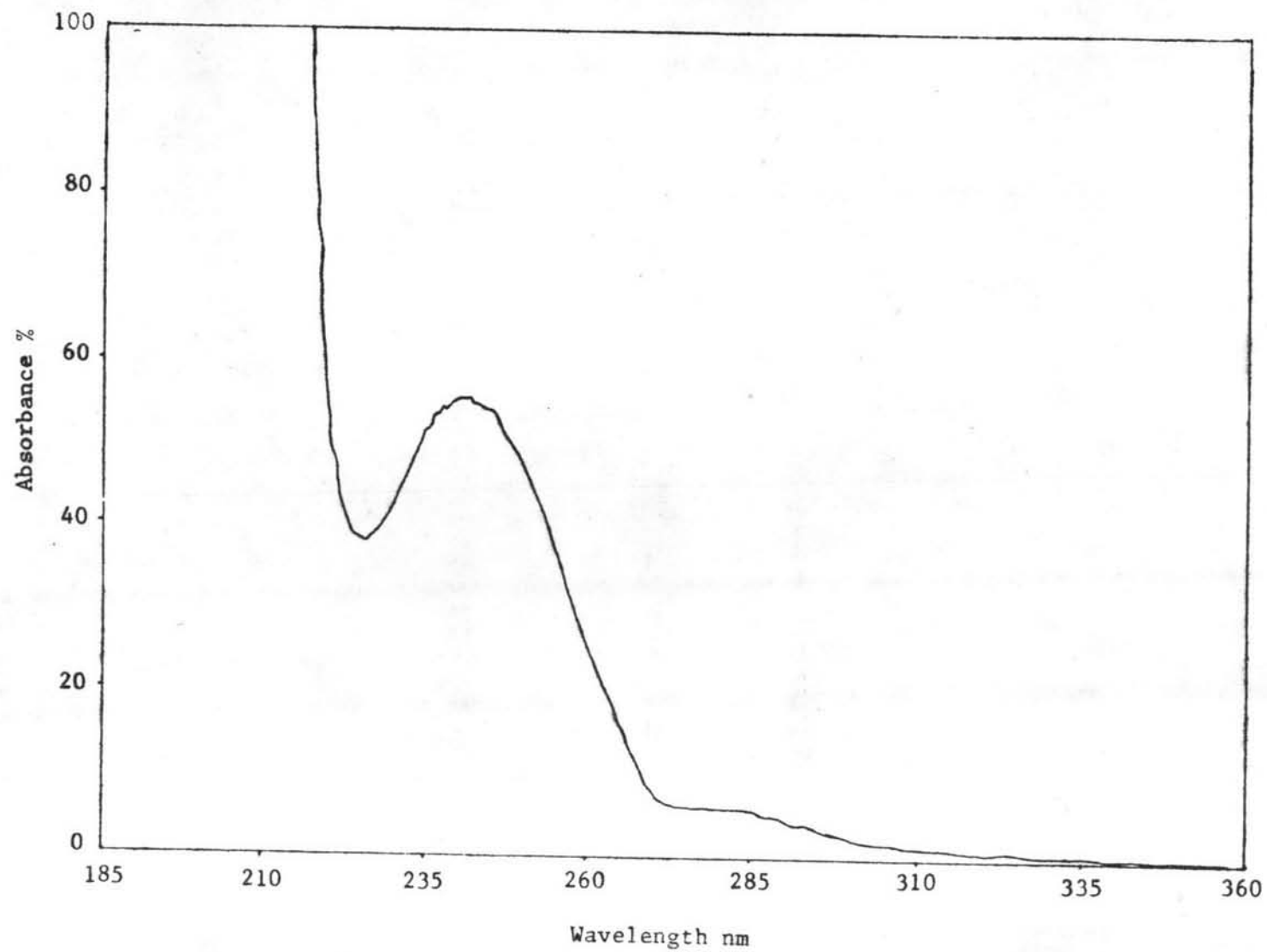


Figure XV. Ultraviolet absorption spectrum of O₁ (isolated uncarine B) in ethyl alcohol.

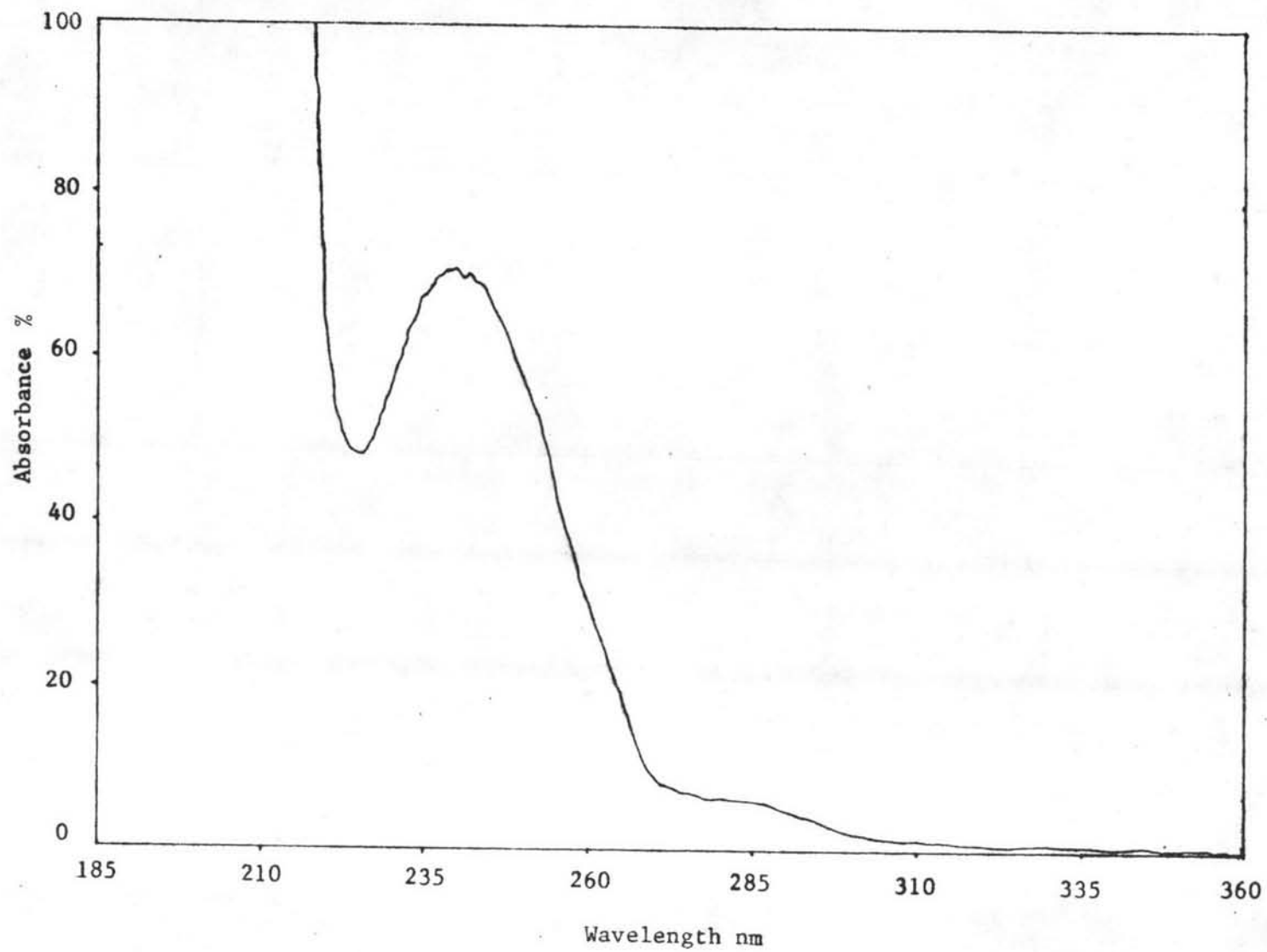


Figure XVI. Ultraviolet absorption spectrum of O₂ (isolated mitraphylline) in ethyl alcohol.

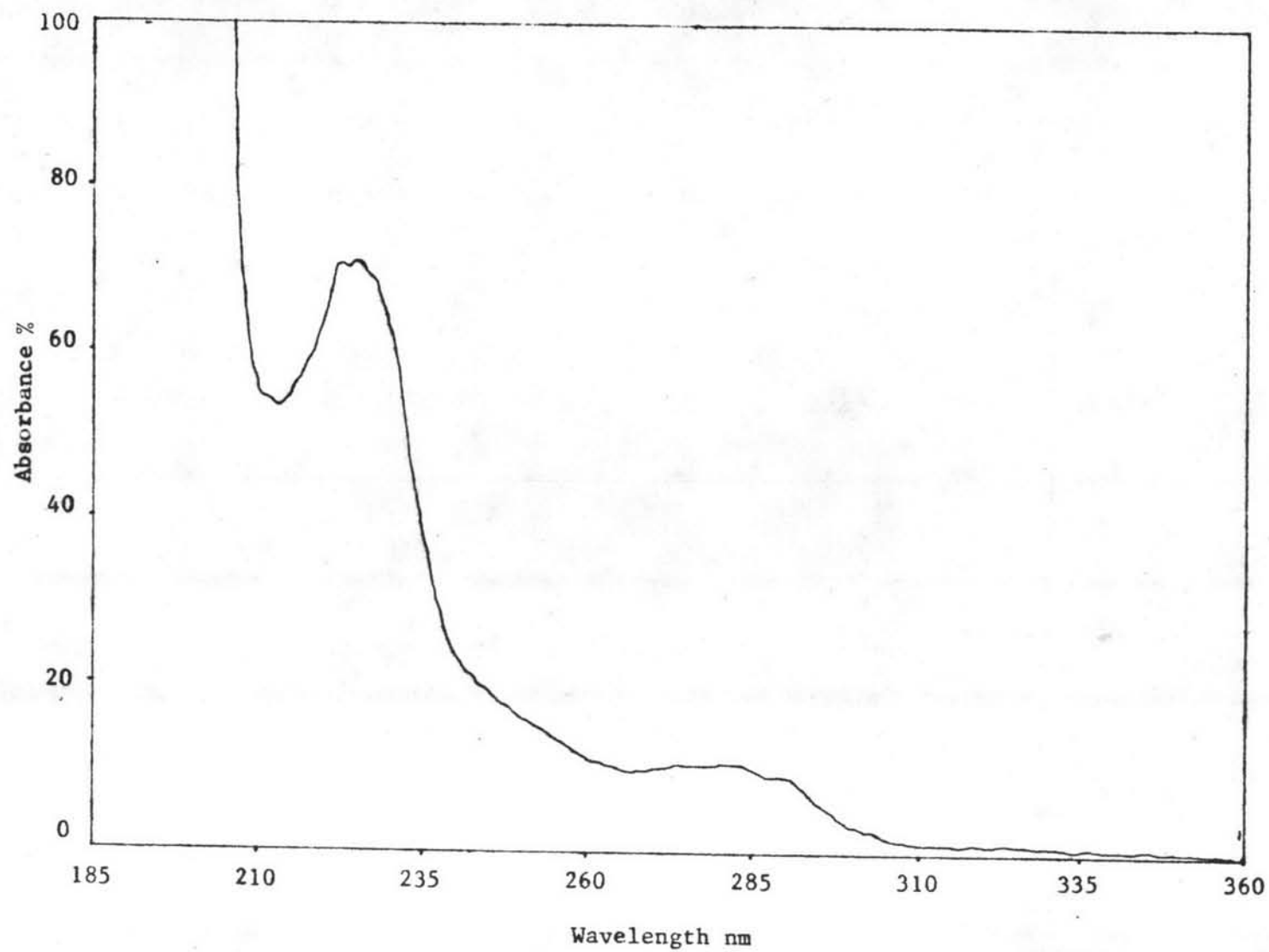


Figure XVII. Ultraviolet absorption spectrum of I₁ (isolated 19-epi-3-isoajmalicine) in ethyl alcohol.

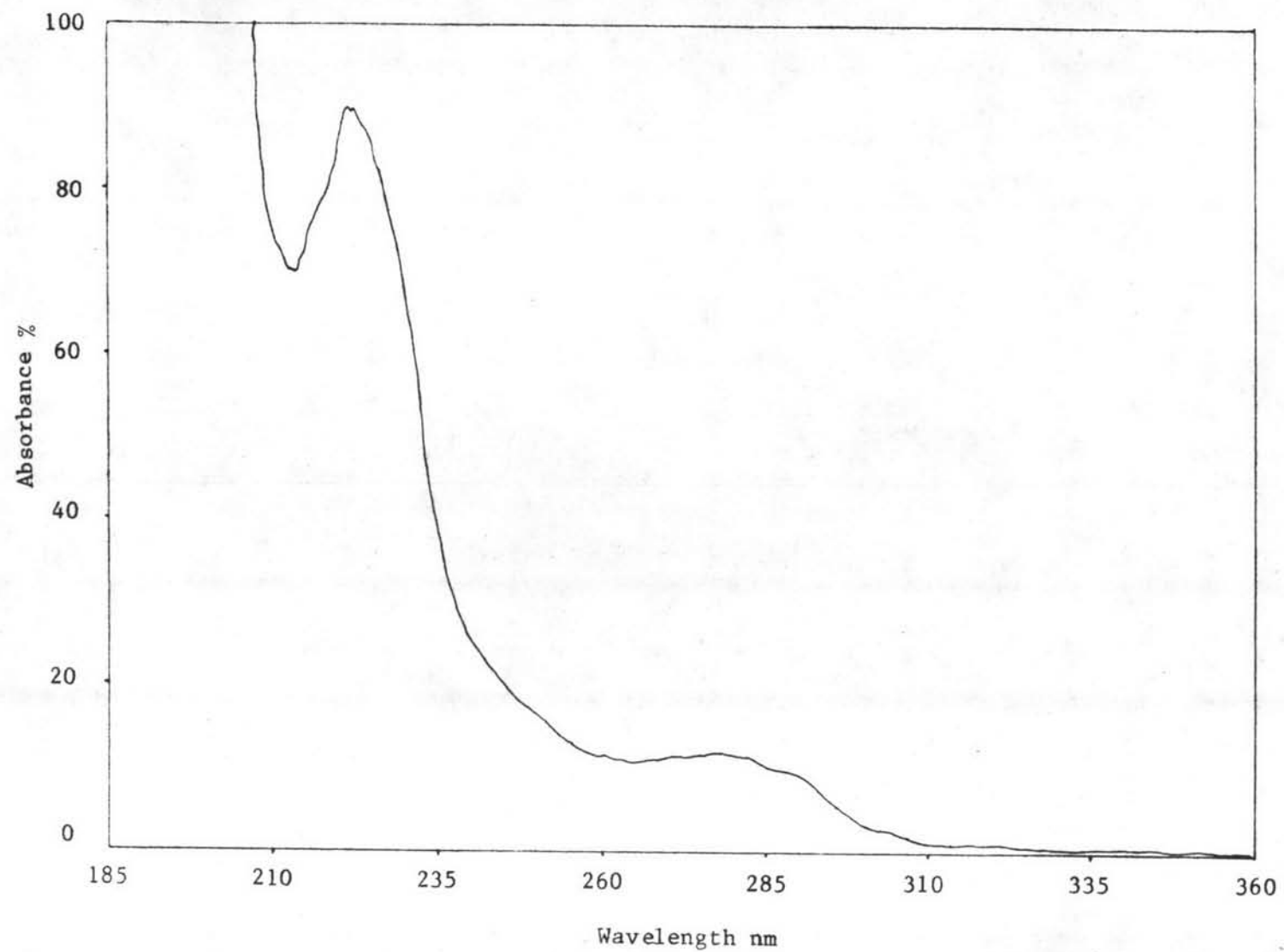


Figure XVIII. Ultraviolet absorption spectrum of I₂ (isolated 3-isoajmalicine) in ethyl alcohol.

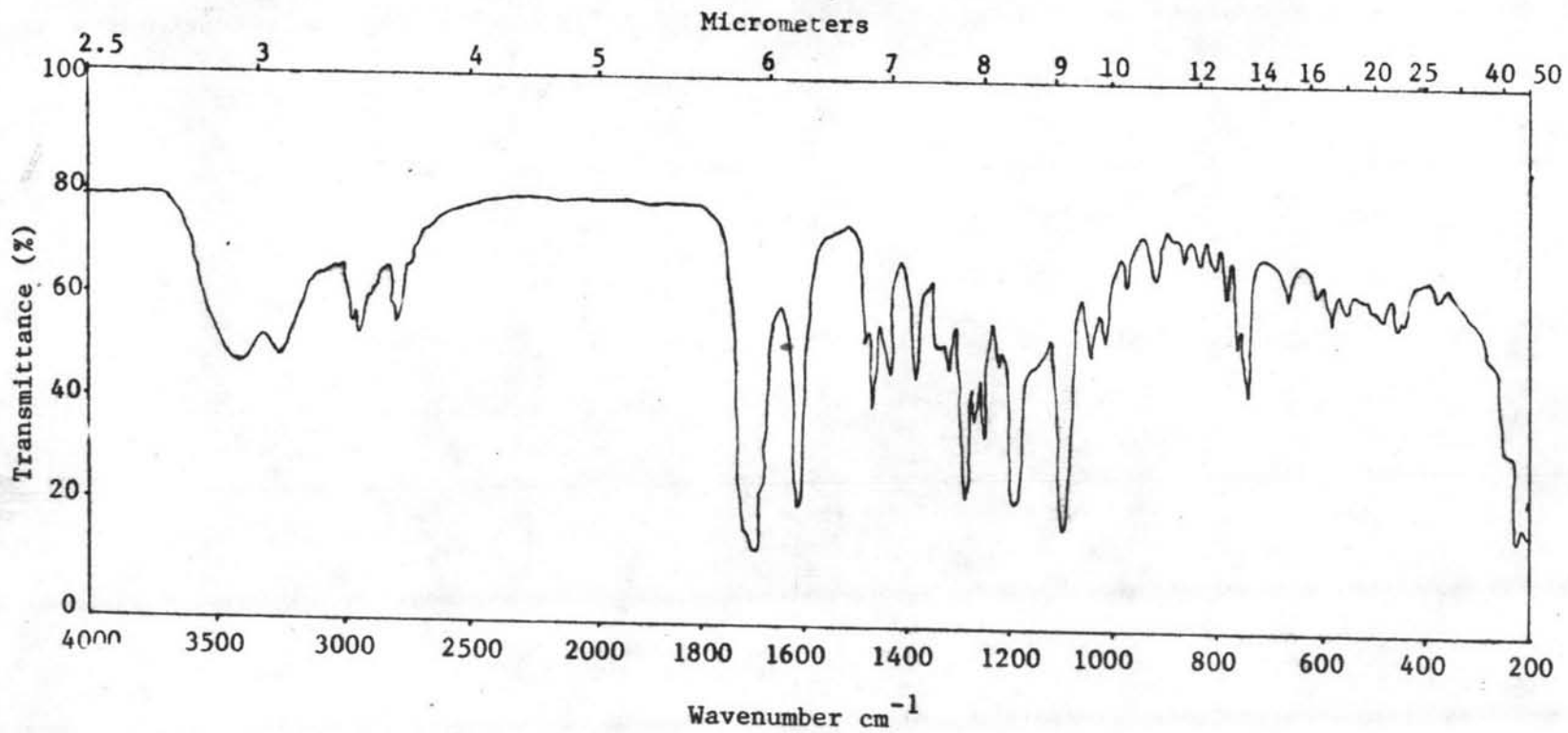


Figure XIX. Infrared absorption spectrum of O₁ (isolated uncarine B).

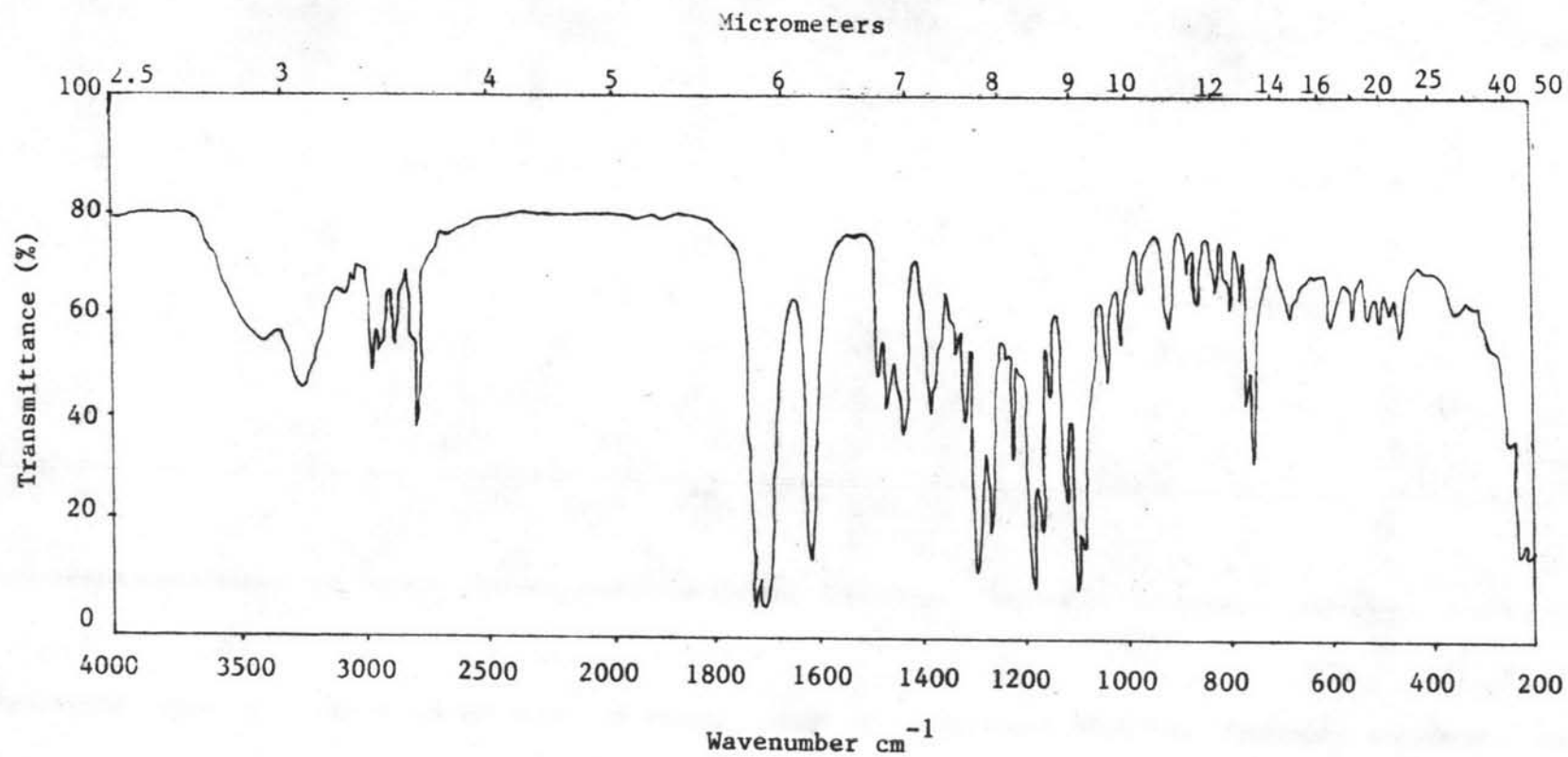


Figure XX. Infrared absorption spectrum of O₂ (isolated mitraphylline).

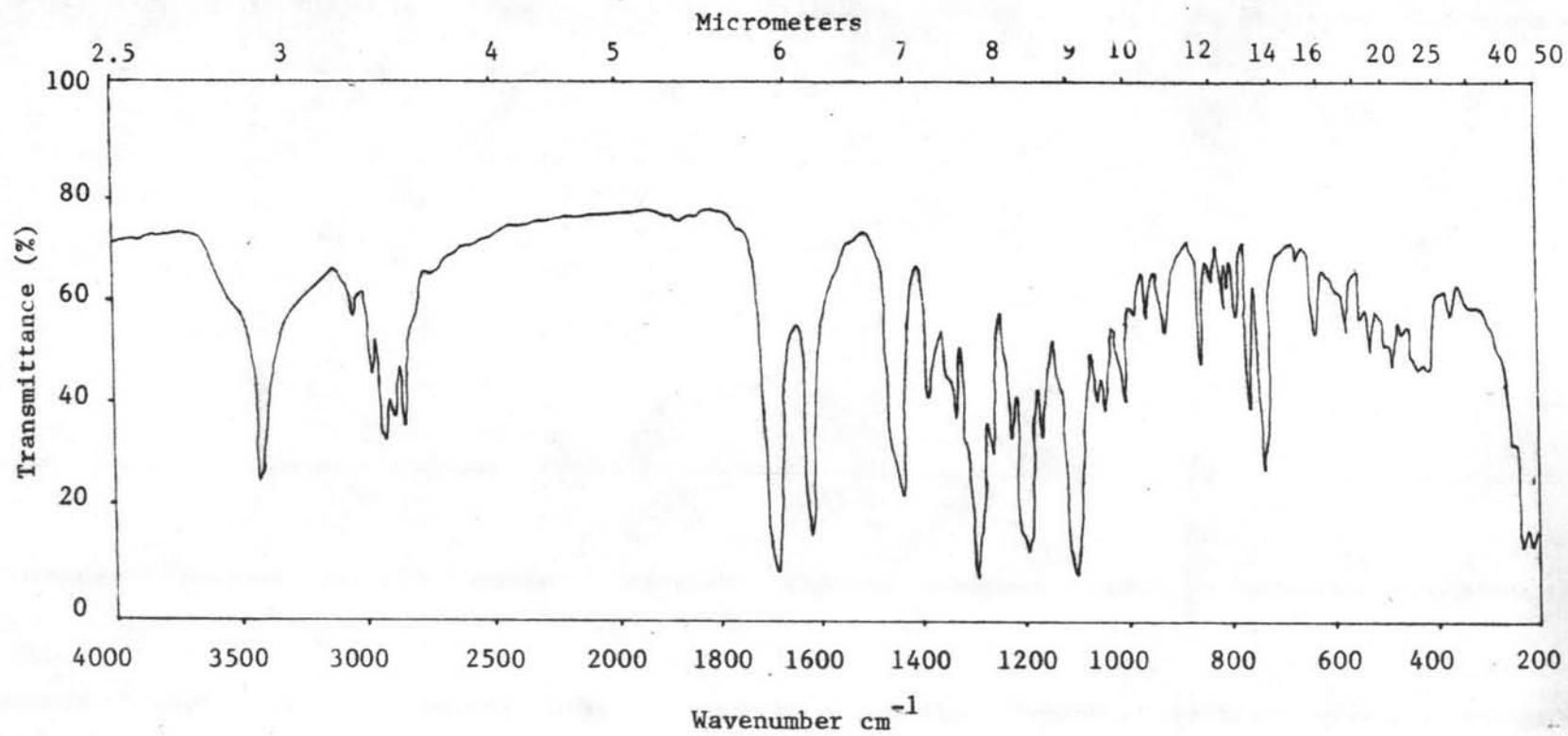


Figure XXI. Infrared absorption spectrum of I₁ (isolated 19-epi-3-isoajmalicine).

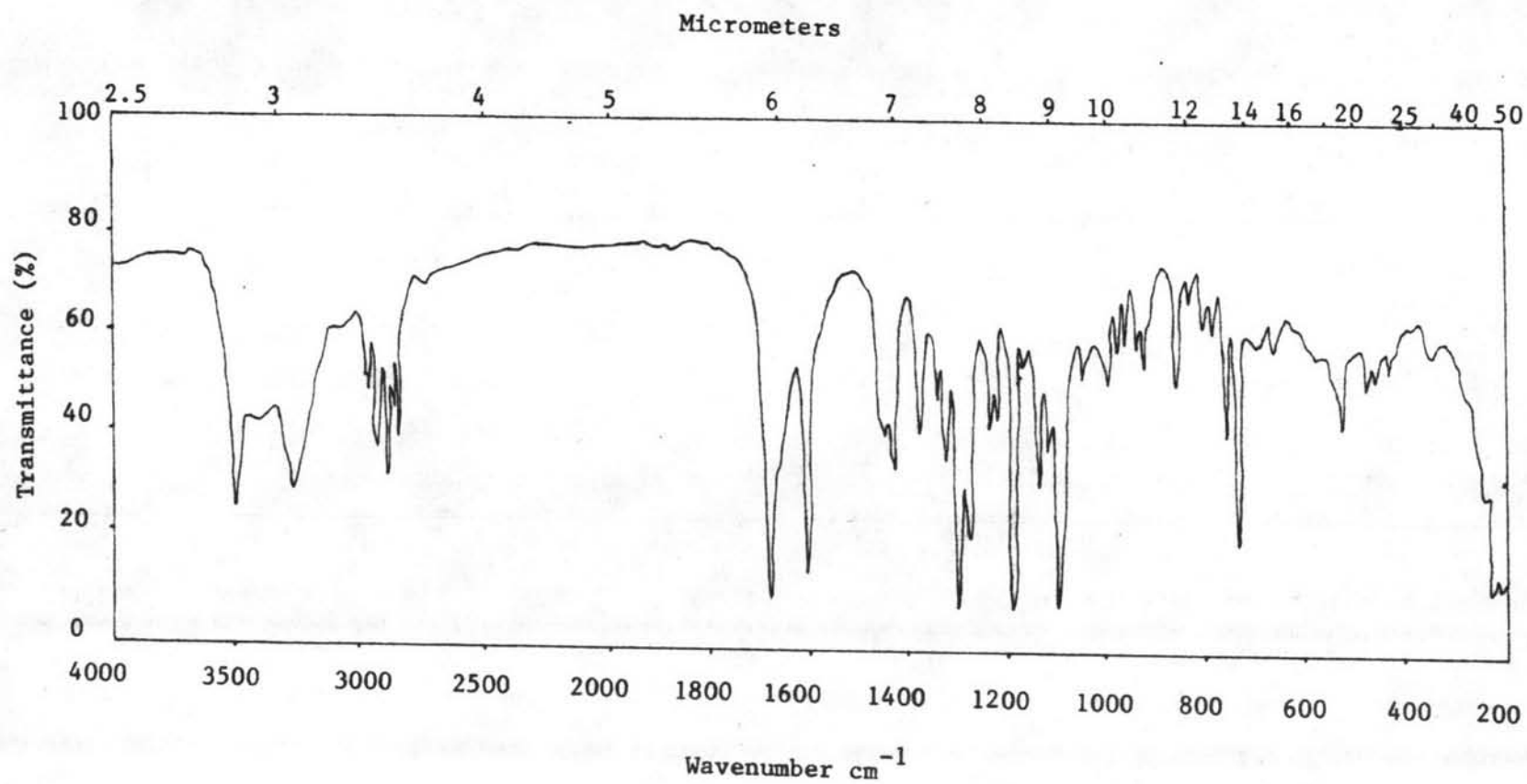


Figure XXII. Infrared absorption spectrum of I_2 (isolated 3-isoajmalicine).

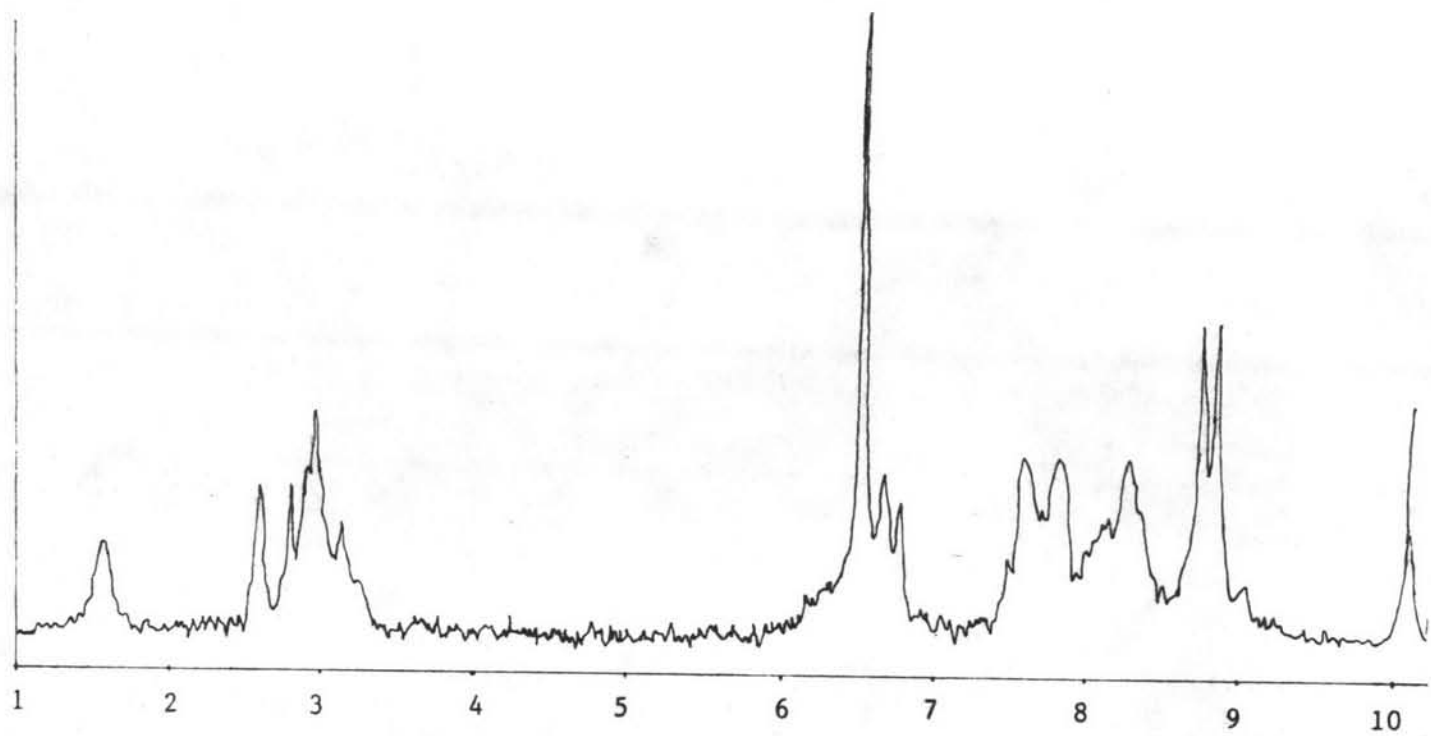


Figure XXIII. Nuclear magnetic resonance spectrum (CDCl_3) of O_1 (isolated uncarine B).

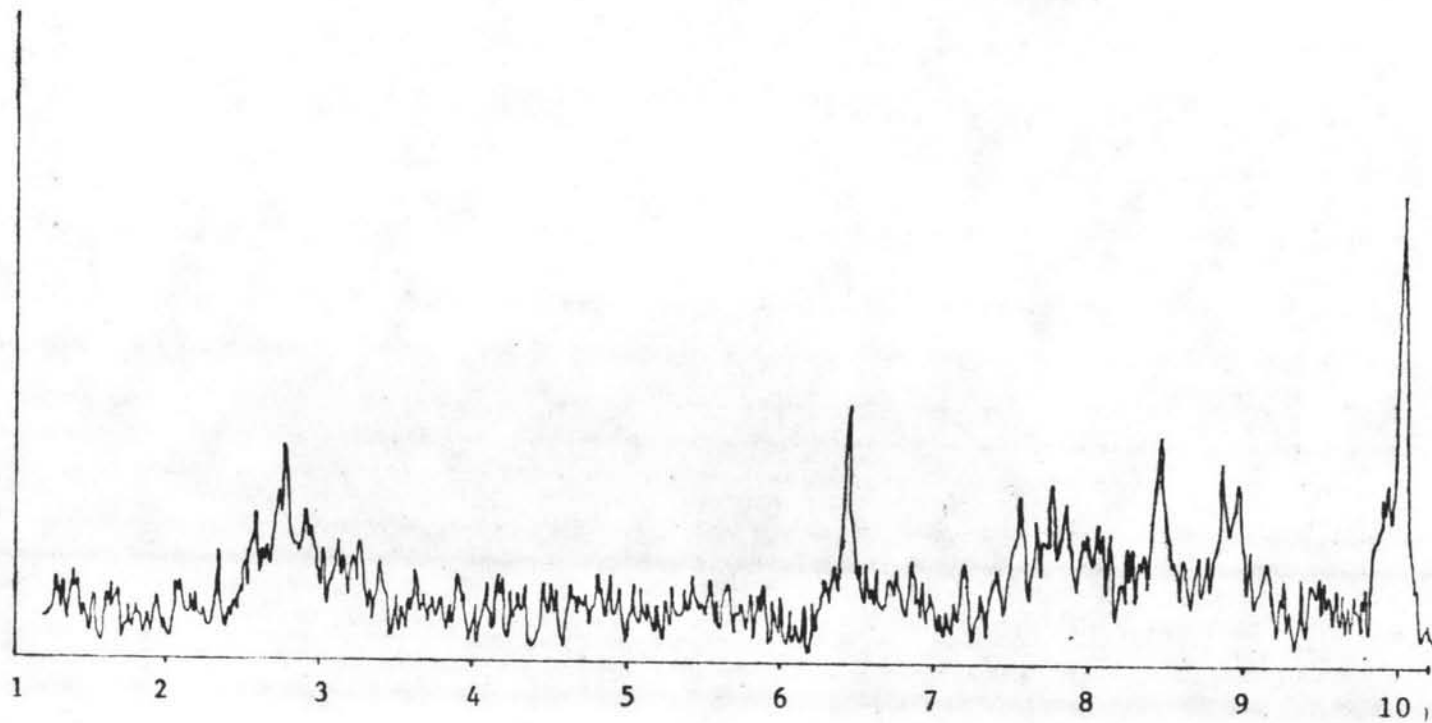


Figure XXIV. Nuclear magnetic resonance spectrum (CDCl_3) of O_2 (isolated mitraphylline).

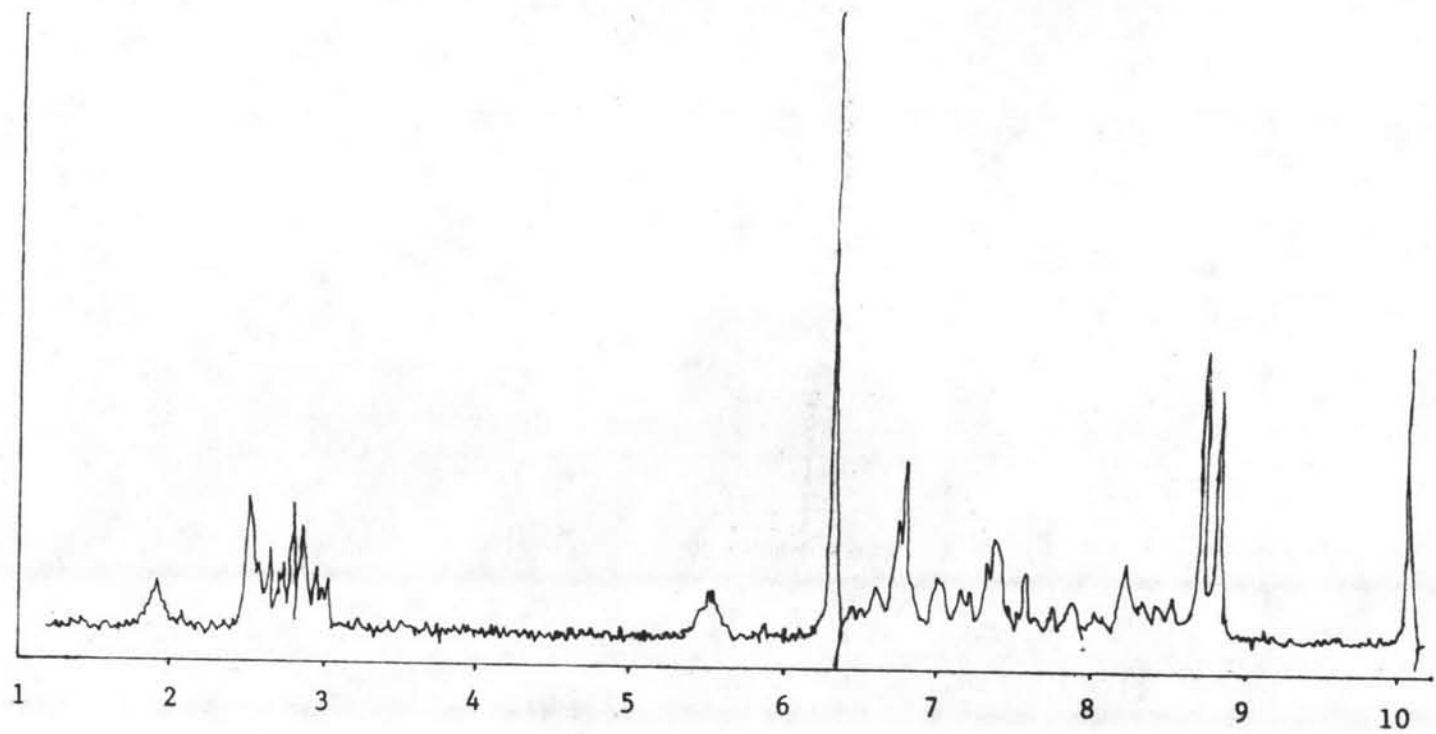


Figure XXV. Nuclear magnetic resonance spectrum (CDCl_3) of I_1 (isolated 19-epi-3-isoajmalicine).

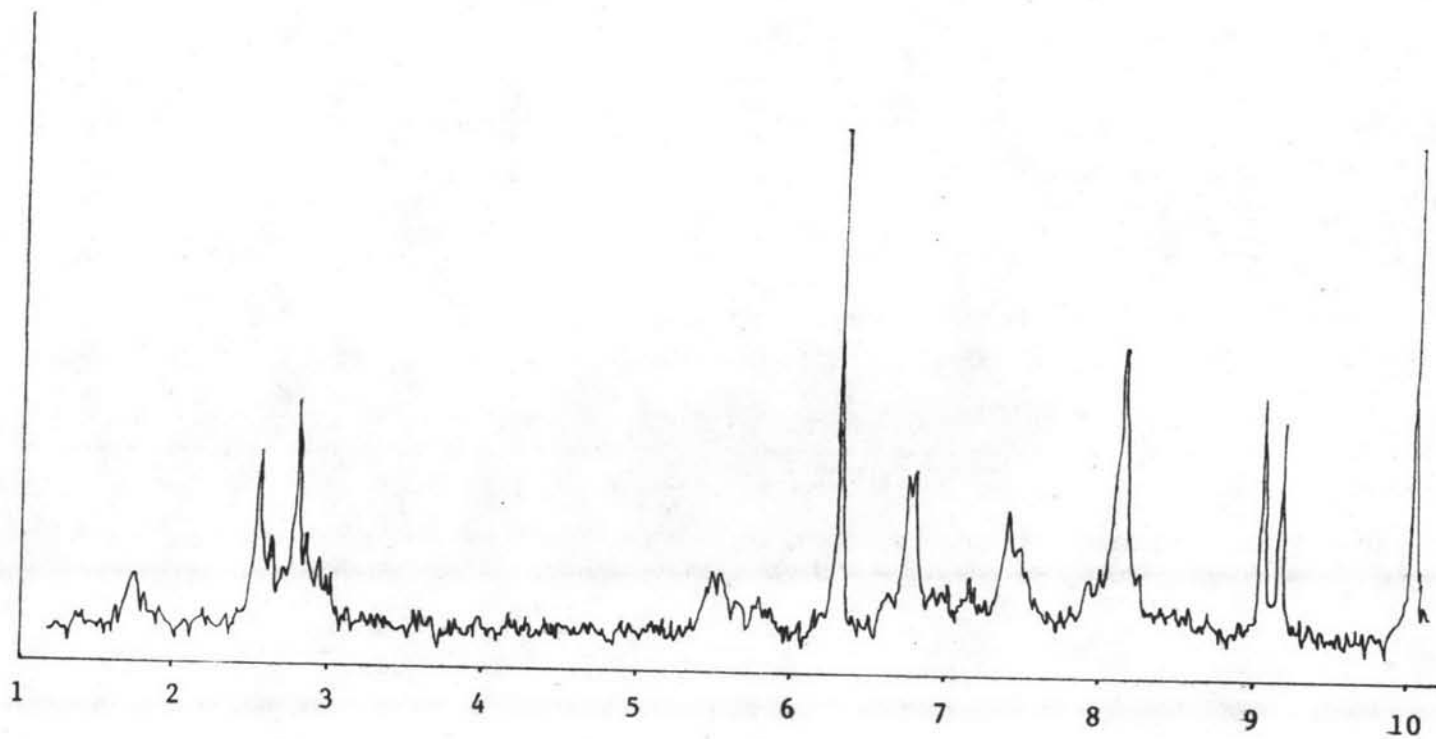


Figure XXVI. Nuclear magnetic resonance spectrum (CDCl_3) of I_2 (isolated 3-isoajmalicine).

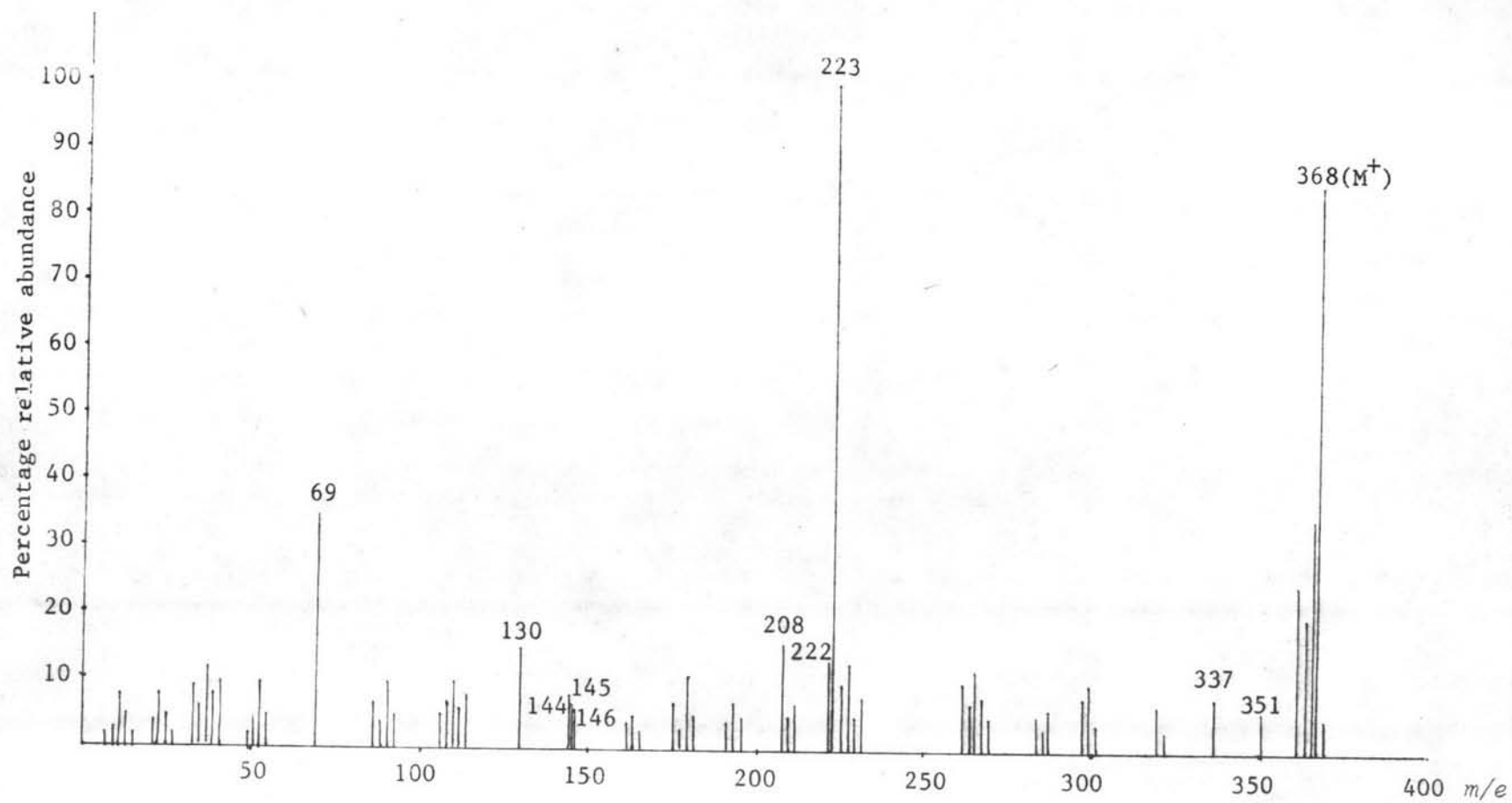


Figure XXVII. Mass spectrum of O_1 (isolated uncarine B).

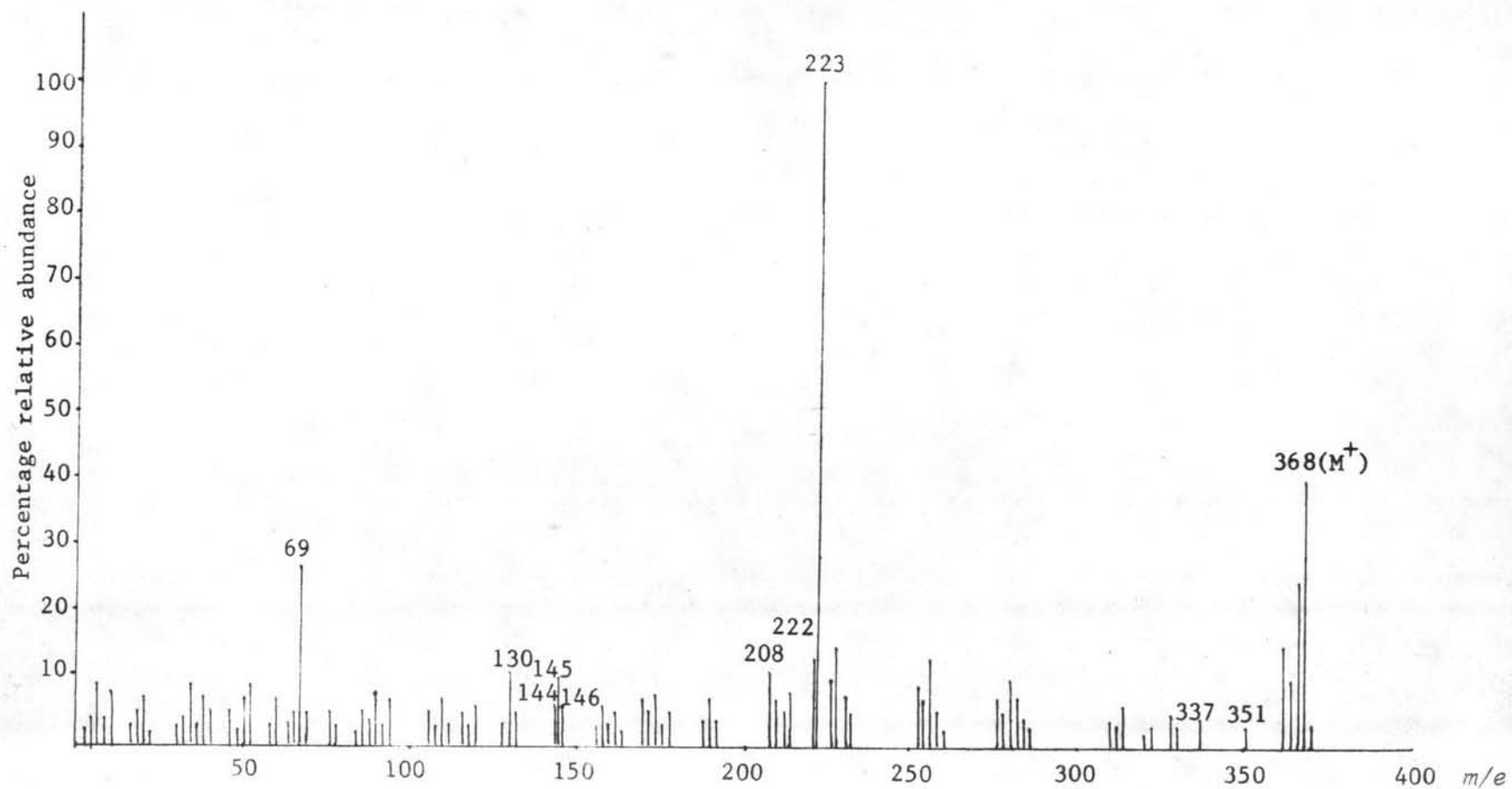


Figure XXVIII. Mass spectrum of O₂ (isolated mitraphylline).

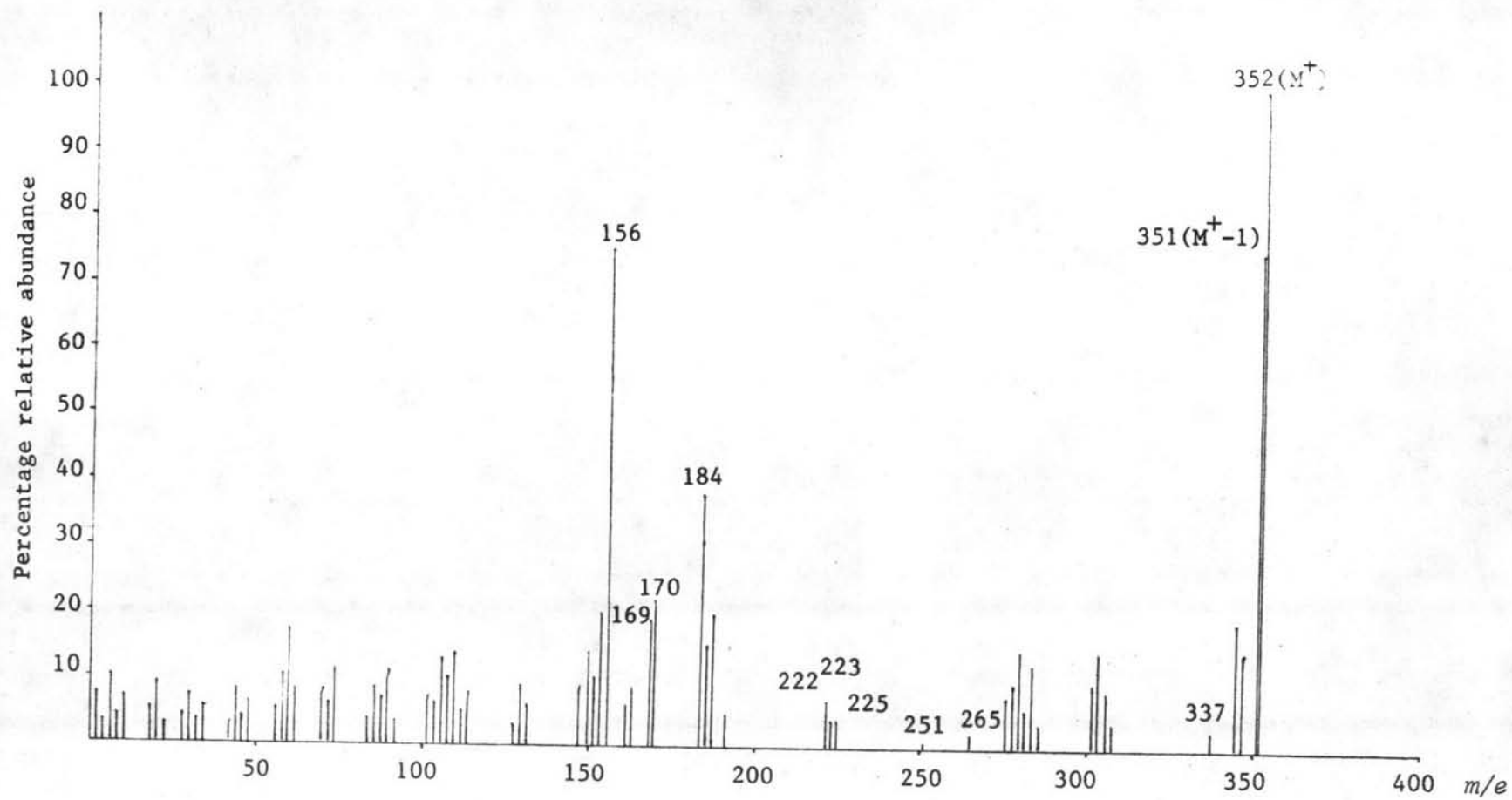


Figure XXIX. Mass spectrum of I_1 (isolated 19-epi-3-isoajmalicine).

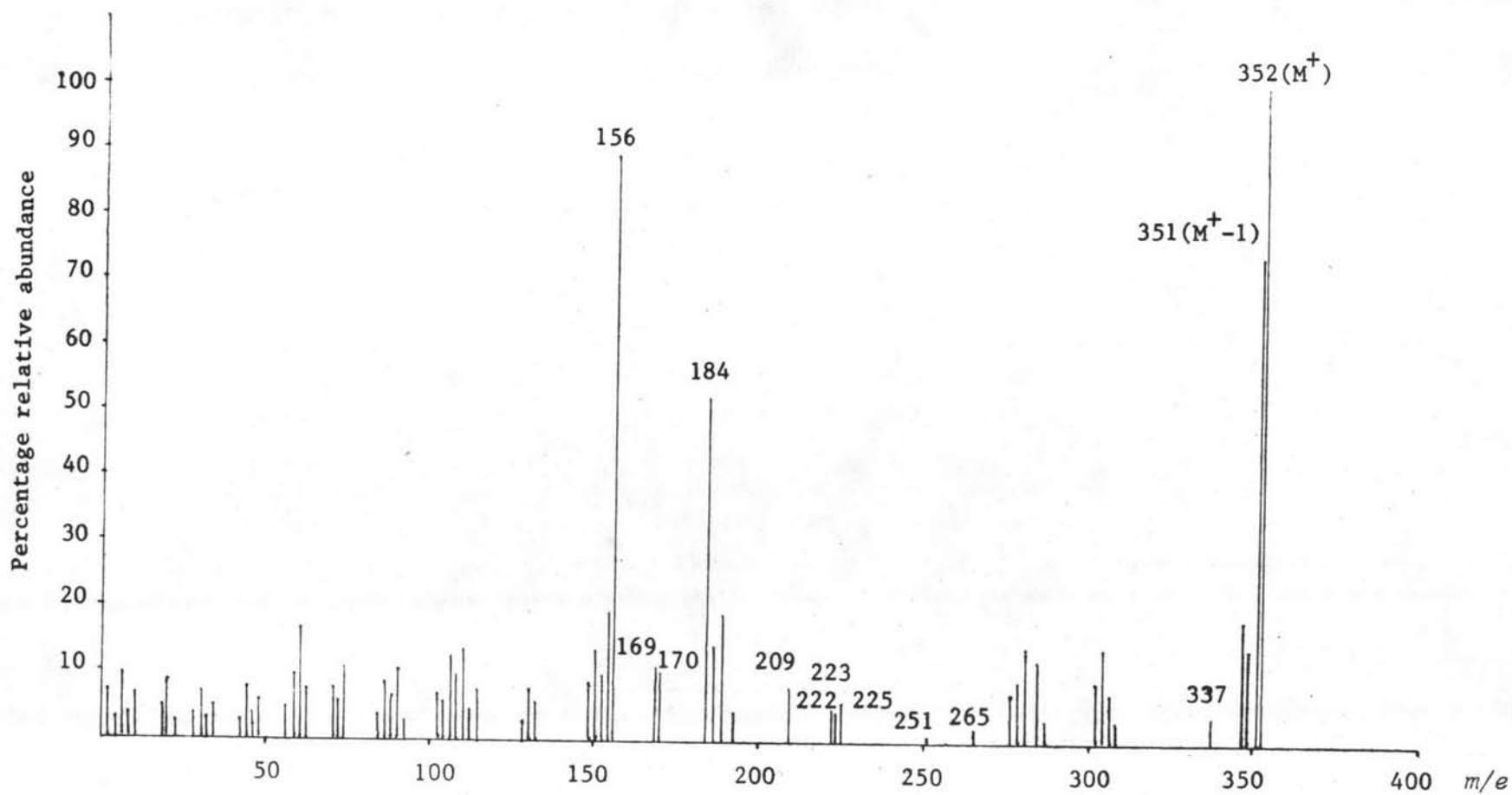


Figure XXX. Mass spectrum of I₂ (isolated 3-isoajmalicine).



Uncaria salaccensis Bakh. f. nom provis

VITA

Mr. Sumphan Wongseripipatana was born on 30th January, 1945 in Suphanburi, Thailand. He obtained a B.Sc. in Pharm. in 1970 from the Faculty of Pharmacy, Mahidol University. At present he is an instructor of the Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand.

