

$^1\text{H}$  NMR DATA OF MONOTERPENOID INDOLE ALKALOIDS

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Abstract -  $^1\text{H}$  NMR data of 163 monoterpene indole alkaloids are presented in diagram form.

## INTRODUCTION

Progress in nuclear magnetic resonance has been enormous during the past 15 years.<sup>1</sup> Modern instruments equipped with superconducting magnets and improved data processing systems allow structures of complex natural products to be completely solved. Along with  $^{13}\text{C}$  NMR, high resolution  $^1\text{H}$  NMR with its ability to distinguish all the individual protons of the unknown molecule has become a highly valued tool.

A few summaries of the  $^1\text{H}$  NMR data of indole alkaloids have already been published. The reviews compiled by Crabb<sup>2</sup> cover the whole alkaloid field (including  $^{13}\text{C}$  NMR), but rely on selected examples only. The earlier catalogues of indole alkaloids by Hesse<sup>3</sup> and Gabetta and Mustich<sup>4</sup> and some textbooks, e.g. the one by Cordell<sup>5</sup>, contain fragmentary  $^1\text{H}$  NMR information. The present review is intended to serve as a reference collection of indole alkaloid  $^1\text{H}$  NMR data and assist in elucidating the structures of new alkaloids. The  $^1\text{H}$  NMR characteristics of the main structural classes are presented in an easy-to-use form.

## GENERAL REMARKS

The literature is covered from 1979 to mid-1985, with the inclusion of some earlier studies. Only completely or nearly completely assigned spectra are reviewed. Rearranged monoterpene indole alkaloids (e.g. *Cinchona*) are not included, and for the sake of manageability the review is limited to naturally occurring compounds and some of their simple derivatives (e.g. acetates).

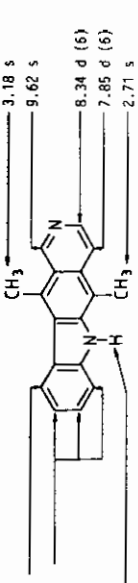
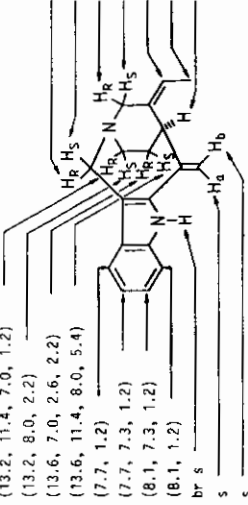
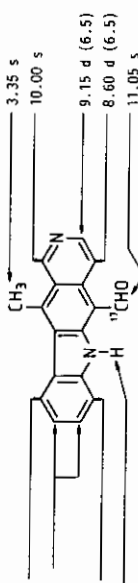
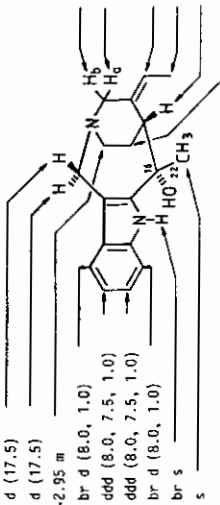
The alkaloids are arranged in order of increasing molecular weight (monomers followed by bis-indole alkaloids). Each entry is provided with the alkaloid name (the one used in the original paper), molecular formula, spectrometer frequency, solvent and an abbreviated reference. Complete references, as well as the alphabetical list of alkaloids, are presented at the end of this review.

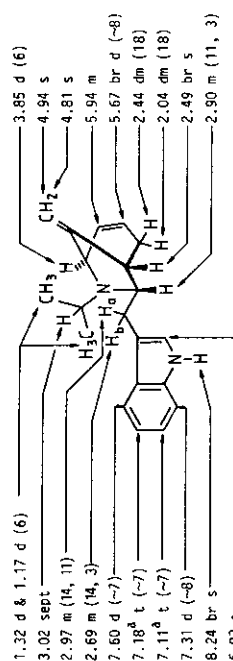
The structural formulae are drawn as in the original reports except in some cases where it was necessary to modify the original drawing slightly. For clarity, numbering of carbon atoms in the formulae has been omitted except for numbers that appear in the name of the alkaloid.

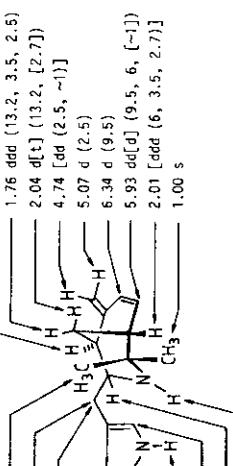
Chemical shifts are given as  $\delta$ -values in ppm downfield from internal TMS (unless otherwise noted);  $\text{CDCl}_3$  is preferred as solvent. Coupling constants are given in Hz and appear in parentheses in order of magnitude.

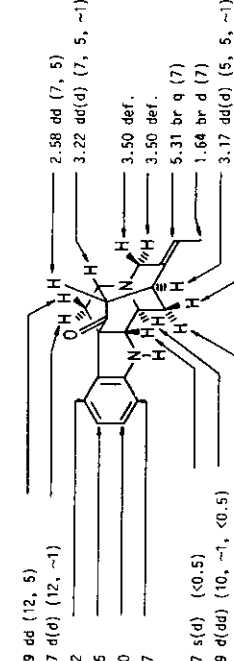
The common  $\alpha/\beta$ -notation of protons is indicated normally. Notations a/b, A/B, R/S, axial/equatorial (ax/eq) and exo/endo (ex/en) are used as in the original paper. Other abbreviations used throughout this work are s (singlet), d (doublet), t (triplet), q (quartet), quint (quintet), sept (septet), m (multiplet), br (broad), na (narrow) and def (deformed). Superscripts a, b, c etc. denote interchangeable assignments.

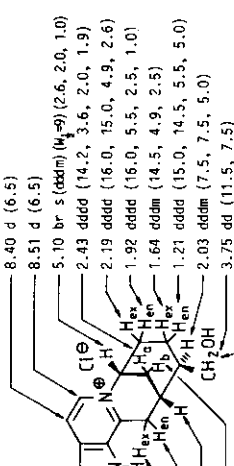
Additional data and remarks are gathered in notes. We apologize in advance for any omissions and errors that, despite careful proof-reading, may appear in the text. We hope that this collection will prove useful for chemists investigating alkaloids.

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| <p>NAME: Ellipticine<br/> FREQUENCY: 270 MHz SOLVENT: <math>(CD_3)_2SO</math><br/> REFERENCE: (6) S. Michel et al., <i>Tetrahedron Lett.</i>, 1980, <u>21</u>, 4027.<br/> NOTES:</p>                                        | <p>MW: 246<br/> MF: <math>C_{17}H_{14}N_2</math><br/> NO: 1</p>  <p>8.31 d (8)<br/> 7.14-7.52 m<br/> 11.31 s<br/> 3.18 s<br/> 9.62 s<br/> 8.34 d (6)<br/> 7.85 d (6)<br/> 2.71 s</p>                                                                                                                                                                                                                                                                                       |
| <p>NAME: Apparicine<br/> FREQUENCY: 300 MHz SOLVENT: <math>CDCl_3</math><br/> REFERENCE: (7) T.A. van Beek et al., <i>Planta Med.</i>, 1985, 277.<br/> NOTES: For earlier data in <math>(CD_3)_2CO</math>, see Ref. 78.</p> | <p>MW: 264<br/> MF: <math>C_{18}H_{20}N_2</math><br/> NO: 3</p>  <p>3.06 (13.2, 11.4, 7.0, 1.2)<br/> 3.40 (13.2, 8.0, 2.2)<br/> 1.88 (13.6, 7.0, 2.6, 2.2)<br/> 2.15 (13.6, 11.4, 8.0, 5.4)<br/> 7.42 (7.7, 1.2)<br/> 7.05 (7.7, 7.3, 1.2)<br/> 7.17 (8.1, 7.3, 1.2)<br/> 7.28 (8.1, 1.2)<br/> 7.88 br s<br/> 5.38 s<br/> 5.25 s<br/> 4.26 (17.7)<br/> 4.49 (17.7)<br/> 3.80 (16.0, 2.3)<br/> 3.18 (16.0, 1.2)<br/> 5.23 (7.0)<br/> 1.45 (7.0, 2.3)<br/> 3.91 (5.4, 2.6)</p> |
| <p>NAME: 17-Oxoellipticine<br/> FREQUENCY: 270 MHz SOLVENT: <math>(CD_3)_2SO</math><br/> REFERENCE: (6) S. Michel et al., <i>Tetrahedron Lett.</i>, 1980, <u>21</u>, 4027.<br/> NOTES:</p>                                  | <p>MW: 260<br/> MF: <math>C_{17}H_{12}N_2O</math><br/> NO: 2</p>  <p>8.40 d (8)<br/> 7.30-7.60 m<br/> 7.85 d (8)<br/> 12.80 s<br/> 3.35 s<br/> 10.00 s<br/> 9.15 d (6.5)<br/> 8.60 d (6.5)<br/> 11.05 s</p>                                                                                                                                                                                                                                                               |
| <p>NAME: 16S-Hydroxy-16,22-dihydroapparicine<br/> FREQUENCY: 300 MHz SOLVENT: <math>CDCl_3</math><br/> REFERENCE: (8) P. Perera et al., <i>J. Nat. Prod.</i>, 1984, <u>47</u>, 835.<br/> NOTES:</p>                         | <p>MW: 282<br/> MF: <math>C_{18}H_{22}N_2O</math><br/> NO: 4</p>  <p>4.73 d (17.5)<br/> 3.95 d (17.5)<br/> 2.89-2.95 m<br/> 7.46 br d (8.0, 1.0)<br/> 7.18 ddd (8.0, 7.5, 1.0)<br/> 7.08 ddd (8.0, 7.5, 1.0)<br/> 7.33 br d (8.0, 1.0)<br/> 9.10 br s<br/> 1.73 s<br/> 3.58 br d (17.0, 2.5)<br/> 3.56 br d (17.0, 1)<br/> 5.69 q (6.9)<br/> 1.75 ddd (6.9, 2.5, 1)<br/> 3.32 dd (12.0, 3.5)<br/> 2.01-2.22 m</p>                                                           |

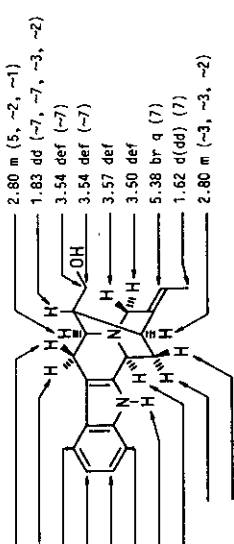
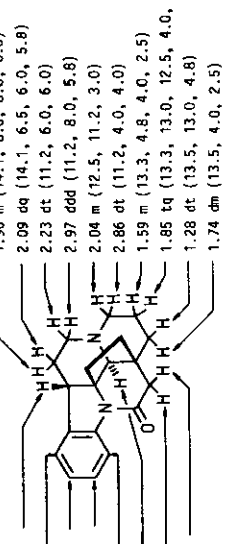
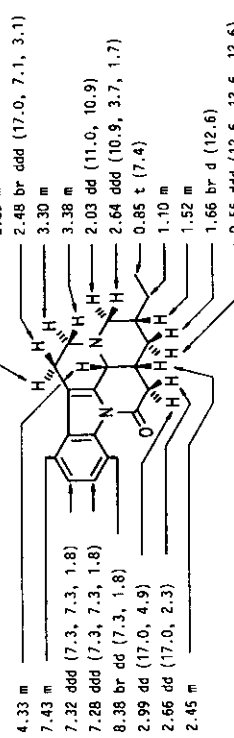
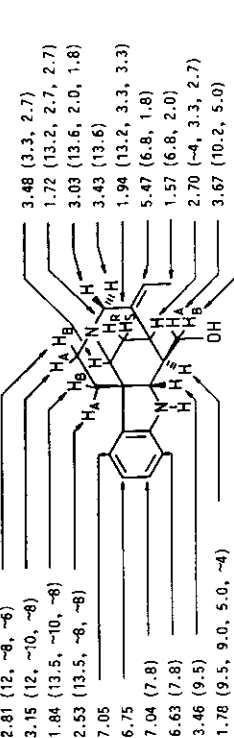
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| NAME: Peduncularine<br>FREQUENCY: 360 MHz<br>REFERENCE: (9) H.-P. Ros et al., <u>Helv. Chim. Acta</u> , 1979, 62, 481.<br>NOTES: | MW: 292<br>MF: C <sub>20</sub> H <sub>24</sub> N <sub>2</sub><br>NO: 5<br><br><br>1.32 d & 1.17 d (6)<br>3.02 sept<br>2.97 m (14, 11)<br>2.69 m (14, 3)<br>7.60 d (~7)<br>7.18 <sup>a</sup> t (~7)<br>7.11 <sup>a</sup> t (~7)<br>7.31 d (~8)<br>8.24 br s<br>6.93 s<br>3.85 d (6)<br>4.94 s<br>4.81 s<br>5.94 m<br>5.67 br d (~8)<br>2.44 dm (18)<br>2.04 dm (18)<br>2.49 br s<br>2.90 m (11, 3) |
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| NAME: Sorelline<br>FREQUENCY: 200 MHz<br>REFERENCE: (11) R. Kyburz et al., <u>Helv. Chim. Acta</u> , 1979, 62, 2539.<br>NOTES: | MW: 292<br>MF: C <sub>20</sub> H <sub>24</sub> N <sub>2</sub><br>NO: 7<br><br><br>1.27 s<br>2.81 dd[d] (14.5, 7.5, <1.5])<br>2.73 dd[d] (14.5, 5.5, <1.5])<br>7.62 d[dd] (7.7, [1.5, <1])<br>7.08 dd[d] (7.7, 7.3, [1.5])<br>7.15 dd[d] (7.7, 7.3, [1.5])<br>7.28 d[dd] (7.7, [1.5, <1])<br>8.23 br s<br>6.97 [dd (<1.5)]<br>3.48 dd (7.5, 5.5, 2.5)<br>1-2 br s<br>2.38 d[t] (2.7, [2.5])<br>1.76 ddd (13.2, 3.5, 2.5)<br>2.04 d[t] (13.2, [2.7])<br>4.74 [dd (2.5, ~1)]<br>5.07 d (2.5)<br>6.34 d (9.5)<br>5.93 dd[d] (9.5, 6, (~1))<br>2.01 [ddd (6, 3.5, 2.7)]<br>1.00 s |
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| NAME: Raufloorine<br>FREQUENCY: 400 MHz<br>REFERENCE: (10) M. Lounasmaa et al., <u>Heterocycles</u> , 1985, 23, 1503.<br>NOTES: | MW: 292<br>MF: C <sub>19</sub> H <sub>20</sub> N <sub>2</sub> O<br>NO: 6<br><br><br>1.69 dd (12, 5)<br>2.47 d(d) (12, ~1)<br>7.22<br>6.85<br>7.10<br>6.77<br>3.37 s(d) (<0.5)<br>3.59 d(dd) (10, ~1, <0.5)<br>1.88 dd(d) (14, 10, ~1)<br>2.58 dd (7, 5)<br>3.22 dd(d) (7, 5, ~1)<br>3.50 def.<br>3.50 def.<br>5.31 br q (7)<br>1.64 br d (7)<br>3.17 dd(d) (5, 5, ~1)<br>1.42 dd(d) (14, 5, ~1) |
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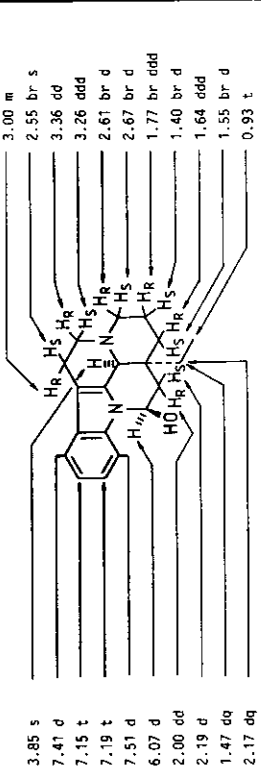
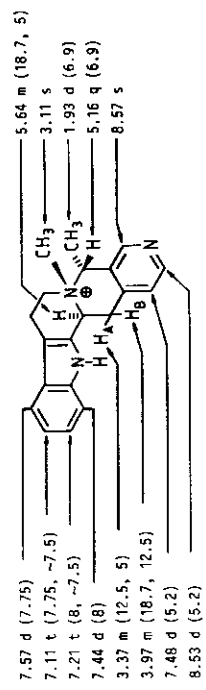
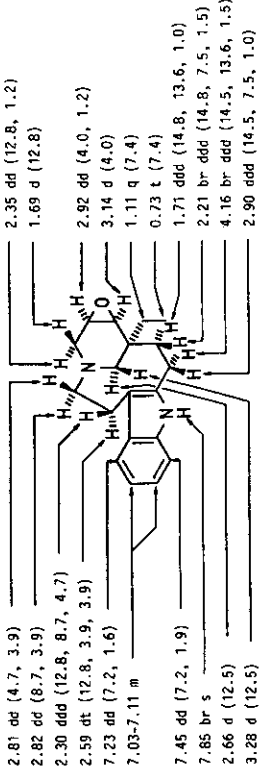
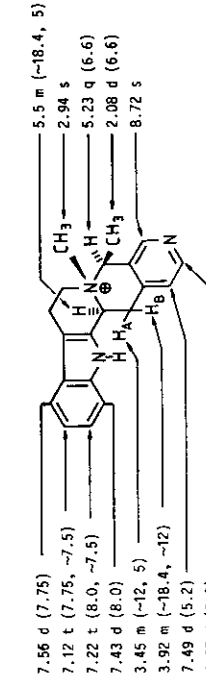
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| NAME: Melinonine-E<br>FREQUENCY: 200/400 MHz<br>REFERENCE: (12) R.P. Borris et al., <u>Helv. Chim. Acta</u> , 1984, 67, 455.<br>NOTES: | MW: 293<br>MF: C <sub>19</sub> H <sub>21</sub> N <sub>2</sub> O<br>NO: 8<br><br><br>8.38 m<br>7.46 m<br>7.79 m<br>3.97 dd (19.9, 7.3)<br>3.50 br d (dd) (19.9, 1.9)<br>2.71 br s (ddm) (3.6)<br>2.25 dm (14.2)<br>8.40 d (6.5)<br>8.51 d (6.5)<br>5.10 br s (ddm) (14.2, 2.0, 1.0)<br>2.43 dddd (14.2, 3.6, 2.0, 1.9)<br>2.19 dddd (16.0, 15.0, 4.9, 2.6)<br>1.92 dddd (16.0, 5.5, 2.5, 1.0)<br>1.64 dddd (14.5, 4.9, 2.5)<br>1.21 dddd (15.0, 14.5, 5.5, 5.0)<br>2.03 dddd (7.5, 7.5, 5.0)<br>3.75 dd (11.5, 7.5)<br>3.83 dd (11.5, 7.5) |
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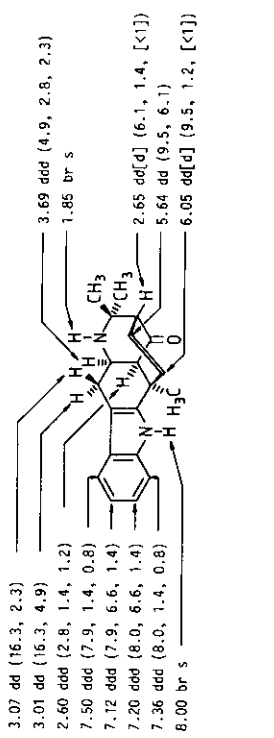
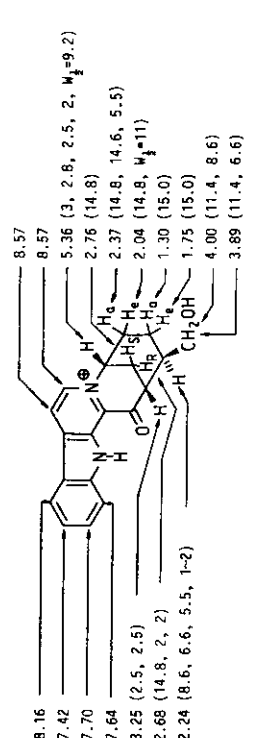
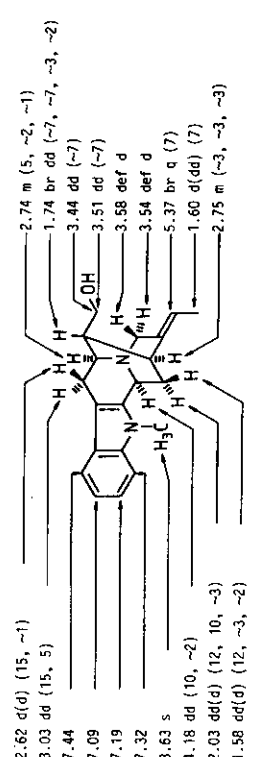
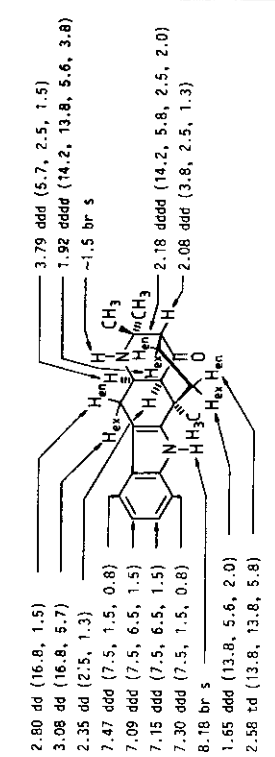


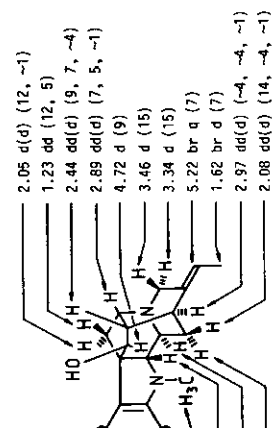
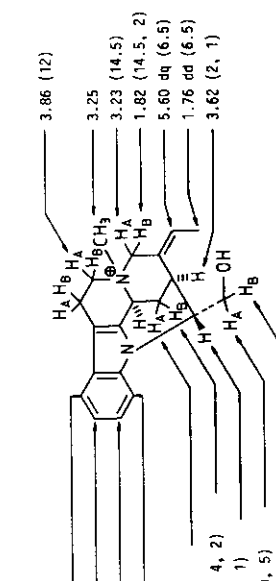
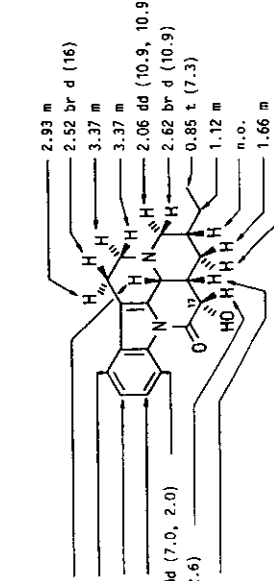
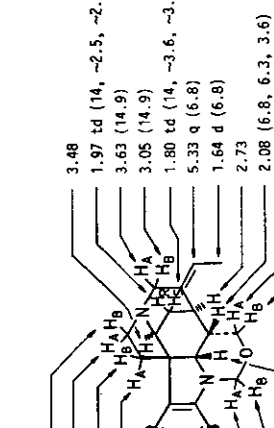
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| <p>NAME: Normacusine B<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (16) M. Lounasmaa et al., <i>Planta Med.</i>, 1985, 519.</p> <p>NAME: Tacamonine<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, 40, 737.</p> <p>MF: <math>C_{19}H_{22}N_2O</math><br/>NO: 13</p> <p>MF: <math>C_{19}H_{22}N_2O</math><br/>NO: 15</p> <p>NOTES:</p>                                                                                 | <p>2.62 d(d) (15, -1)<br/>3.05 dd (15, 5)<br/>7.46<br/>7.09<br/>7.14<br/>7.30<br/>7.88 br s<br/>4.11 d(d) (10, -2)<br/>2.00 dd(d) (12, 10, -3)<br/>1.73 dd(d) (12, -2, -2)</p> <p>2.80 m (5, -2, -1)<br/>1.83 dd (-7, -7, -3, -2)<br/>3.54 def (-7)<br/>3.54 def (-7)<br/>3.57 def<br/>3.50 def<br/>5.38 br q (7)<br/>1.62 d(dd) (7)<br/>2.80 m (-3, -3, -2)</p>                                                                                                                                             |
| <p>NAME: Strepellipine<br/>FREQUENCY: 200/360 MHz<br/>REFERENCE: (17) A. Laguna et al., <i>Planta Med.</i>, 1984, 50, 285.</p> <p>NAME: N-Deacetylisorretuline<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (19) D. Tavernier et al., <i>Bull. Soc. Chim. Belg.</i>, 1978, 82, 595.</p> <p>MF: <math>C_{19}H_{22}N_2O</math><br/>NO: 14</p> <p>MF: <math>C_{19}H_{24}N_2O</math><br/>NO: 16</p> <p>NOTES: Signals not assigned: 1.51 (1H, m) and 2.28 (3H, m).</p> | <p>3.25 br t (8.0, 6.5)<br/>7.17 br d (7.4)<br/>7.06 br t (7.4, 7.4)<br/>7.23 br t (8.0, 7.4)<br/>8.05 br d (8.0)<br/>2.03 s<br/>2.63 d (18.2)<br/>2.46 dd (18.2, 2.4)</p> <p>1.96 m (14.1, 8.0, 8.0, 6.0)<br/>2.09 dq (14.1, 6.5, 6.0, 5.8)<br/>2.23 dt (11.2, 6.0, 6.0)<br/>2.97 ddd (11.2, 8.0, 5.8)<br/>2.04 m (12.5, 11.2, 3.0)<br/>2.86 dt (11.2, 4.0, 4.0)<br/>1.59 m (13.3, 4.8, 4.0, 2.5)<br/>1.85 tq (13.3, 13.0, 12.5, 4.0, 4.0)<br/>1.28 dt (13.5, 13.0, 4.8)<br/>1.74 dm (13.5, 4.0, 2.5)</p>  |
| <p>NAME: Tacamonine<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, 40, 737.</p> <p>NAME: N-Deacetylisorretuline<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (19) D. Tavernier et al., <i>Bull. Soc. Chim. Belg.</i>, 1978, 82, 595.</p> <p>MF: <math>C_{19}H_{22}N_2O</math><br/>NO: 15</p> <p>MF: <math>C_{19}H_{24}N_2O</math><br/>NO: 16</p> <p>NOTES:</p>                                                         | <p>4.33 m<br/>7.43 m<br/>7.32 ddd (7.3, 7.3, 1.8)<br/>7.28 ddd (7.3, 7.3, 1.8)<br/>8.38 br dd (7.3, 1.8)<br/>2.99 dd (17.0, 4.9)<br/>2.66 dd (17.0, 2.3)<br/>2.45 m</p> <p>2.89 m<br/>2.48 br ddd (17.0, 7.1, 3.1)<br/>3.30 m<br/>3.38 m<br/>2.03 dd (11.0, 10.9)<br/>2.64 ddd (10.9, 3.7, 1.7)<br/>0.85 t (7.4)<br/>1.10 m<br/>1.52 m<br/>1.66 br d (12.6)<br/>0.56 ddd (12.6, 12.6, 12.6)</p>                                                                                                                |
| <p>NAME: Strepellipine<br/>FREQUENCY: 200/360 MHz<br/>REFERENCE: (17) A. Laguna et al., <i>Planta Med.</i>, 1984, 50, 285.</p> <p>NAME: N-Deacetylisorretuline<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (19) D. Tavernier et al., <i>Bull. Soc. Chim. Belg.</i>, 1978, 82, 595.</p> <p>MF: <math>C_{19}H_{22}N_2O</math><br/>NO: 14</p> <p>MF: <math>C_{19}H_{24}N_2O</math><br/>NO: 16</p> <p>NOTES: Signals not assigned: 1.51 (1H, m) and 2.28 (3H, m).</p> | <p>2.81 (12, -8, -6)<br/>3.15 (12, -10, -8)<br/>1.84 (13.5, -10, -8)<br/>2.53 (13.5, -8, -8)<br/>7.05<br/>6.75<br/>7.04 (7.8)<br/>6.63 (7.8)<br/>3.46 (9.5)<br/>1.78 (9.5, 9.0, 5.0, -4)</p> <p>3.48 (3.3, 2.7)<br/>1.72 (13.2, 2.7, 2.7)<br/>3.03 (13.6, 2.0, 1.8)<br/>3.43 (13.6)<br/>1.94 (13.2, 3.3, 3.3)<br/>5.47 (6.8, 1.8)<br/>1.57 (6.8, 2.0)<br/>2.70 (-4, 3.3, 2.7)<br/>3.67 (10.2, 5.0)<br/>3.52 (10.2, 9.0)</p>                                                                                   |

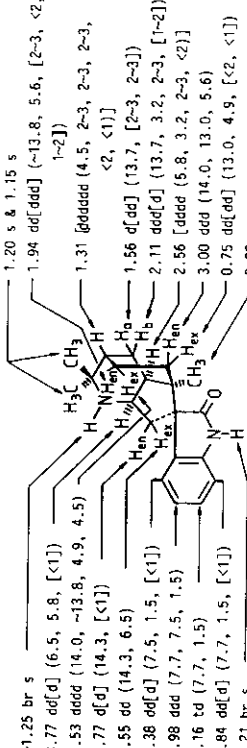
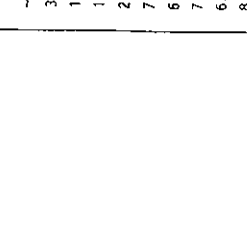
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| <p>NAME: N-Decacetylretuline<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (19) D. Tavernier et al., Bull. Soc. Chim. Belg., 1978, 82, 595.<br/> NOTES:</p> | <p>MM: 296<br/> MF: <math>\text{C}_{19}\text{H}_{24}\text{N}_2\text{O}</math><br/> NO: 17</p> <p>2.95 (11, -7, -7)<br/> 3.18 (11, -7, -7)<br/> 2.09 (13, -7, -7)<br/> 2.25 (13, -7, -7)<br/> 7.08<br/> 6.78<br/> 7.05 (7.8)<br/> 6.65 (7.8)<br/> 3.93 (6)<br/> 3.80 (-11, -10)<br/> 3.79 (-11, -5)</p>                                                                                                                                                                                                                      |
| <p>NAME: 16S-Decarbonehoxytacetamine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (18) T. A. van Beek et al., Tetrahedron, 1984, 40, 737.<br/> NOTES:</p>  | <p>MM: 296<br/> MF: <math>\text{C}_{19}\text{H}_{24}\text{N}_2\text{O}</math><br/> NO: 19</p> <p>4.35 m<br/> 7.43 dd (7.4, 1.2)<br/> 7.22 odd (7.4, 7.4, 1.2)<br/> 7.17 odd (7.4, 7.4, 1.2)<br/> 7.52 dd (7.4, 1.2)<br/> 6.06 dd (4.0, 1.2)<br/> 2.26 ddd (15.5, 3.5, 1.2)<br/> 2.40 ddd (15.5, 4.0, 4.0)<br/> 1.77 br d (12.8)<br/> 1.13 m<br/> 1.58 m<br/> 1.13 ddd (12.8, 12.5, 12.5)</p>                                                                                                                                |
| <p>NAME: 16R-Decarbonehoxytacetamine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (18) T. A. van Beek et al., Tetrahedron, 1984, 40, 737.<br/> NOTES:</p>  | <p>MM: 296<br/> MF: <math>\text{C}_{19}\text{H}_{24}\text{N}_2\text{O}</math><br/> NO: 16</p> <p>4.20 m<br/> 7.46 dd (6.9, 1.8)<br/> 7.17 odd (6.9, 6.9, 1.8)<br/> 7.15 odd (6.9, 6.9, 1.7)<br/> 7.73 dd (6.9, 1.7)<br/> 5.58 dd (9.5, 5.4)<br/> 2.45 odd (13.9, 5.4, 3.2)<br/> 1.89 odd (13.9, 9.5, 3.6)<br/> 2.24 m<br/> 2.91 m<br/> 2.50 m<br/> 3.14 m<br/> 3.20 m<br/> 1.92 dd (11.0, 11.0)<br/> 2.50 m<br/> 0.81 t (7.2)<br/> 1.02 m<br/> 1.40 m<br/> 1.53 br d<br/> 0.37 ddd (12.7, 12.7, 12.7)</p>                   |
| <p>NAME: Deethylbophyllidine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (20) C. Kan et al., Tetrahedron Lett., 1980, 21, 55.<br/> NOTES:</p>             | <p>MM: 296<br/> MF: <math>\text{C}_{18}\text{H}_{20}\text{N}_2\text{O}</math><br/> NO: 20</p> <p>3.36 td (12.5, 12.5, 5.5)<br/> 2.89 ddd (12.5, 6, 0.5)<br/> 1.64 ddd (12.5, 5.5, 0.5)<br/> 2.03 td (12.5, 12.5, 6)<br/> 7.30<br/> 6.86<br/> 7.13<br/> 6.78<br/> 9.03 br s<br/> 2.73 td (11.5, 9, 5.5)<br/> 3.28 ddd (11.5, 7, 0.5)<br/> 2.02 m (11.5, 9, 6.5, 6, 0.5)<br/> 1.74 ddt (12.5, 5.5, 0.5, 0.5)<br/> 2.12 dtd (12.5, 9, 9, 7)<br/> 1.84 dd (14.5, 11.5)<br/> 2.78 dd (14.5, 6)<br/> 3.75 d (6.5)<br/> 3.74 s</p> |

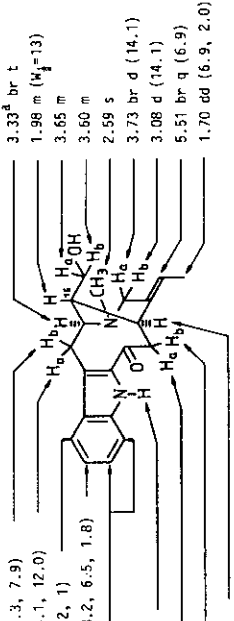
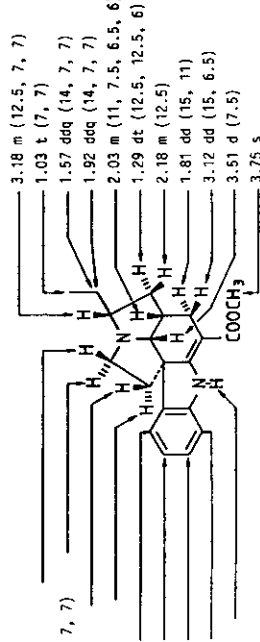
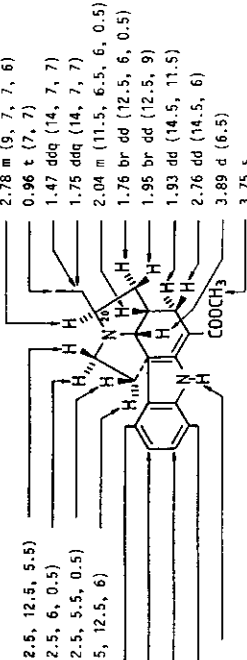
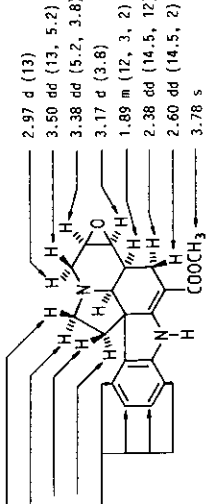
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| <p>NAME: Dichonine<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (21) P. Perera et al., <i>Planta Med.</i>, 1983, 49, 232.<br/> NOTES:</p>                                         | <p>MM: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 21</p> <p>3.16 (12.2, 7.5, 1.4)<br/> 3.31 (12.2, 10.6, 7.2)<br/> 3.81<br/> 2.47 (14.0, 10.6, 7.5)<br/> 1.65 (14.0, 7.2, 1.4)<br/> 7.14 (7.7, 1.6, &lt;1)<br/> 6.82 (7.7, 7.7, 1.0)<br/> 7.05 (7.7, 7.7, 1.0)<br/> 5.60 (7.7, 1.0, &lt;1)<br/> 4.59<br/> 2.26 (15.8, 11.4, 6.9)<br/> 2.05 (15.8, 7.2, 1.7)</p>                                                                                                                                                                                                                                                                            |
| <p>NAME: Geissoschizol<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (22) X.Z. Feng et al., <i>Planta Med.</i>, 1982, 44, 212.<br/> NOTES:</p>                                     | <p>MM: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 23</p> <p>7.52<br/> 7.14<br/> 7.18<br/> 7.38<br/> 8.20 br s<br/> 4.24 br s<br/> 2.33<sup>a</sup> m<br/> 2.21<sup>a</sup> m<br/> 1.55 m (7, 5)<br/> 2.68 br d (15, -4, -1)<br/> 3.05 m (15, 12, -5)<br/> 3.08<sup>b</sup> ddd (12, -12, -4)<br/> 3.27<sup>b</sup> m (-12, -5, -1)<br/> 3.68 br d (12, &lt;0.5)<br/> 3.01 br d (12, &lt;0.5)<br/> 3.0 m<br/> 5.56 br q (6.5, &lt;0.5, &lt;0.5)<br/> 1.67 d(d) (6.5)<br/> 3.60 br dd (7)<br/> 3.56 br dd (5)</p>                                                                                                                            |
| <p>NAME: (+)-Eburnamine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (15) X.Z. Feng et al., <i>J. Nat. Prod.</i>, 1984, 47, 117.<br/> NOTES:</p>                                  | <p>MM: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 22</p> <p>3.50 s<br/> 7.46 d<br/> 7.14 t<br/> 7.17 t<br/> 7.73 d<br/> 5.51 dd<br/> 2.21 dd<br/> 1.42 dd<br/> 1.37 dq<br/> 2.00 dq<br/> 2.90 m<br/> 2.48 br d<br/> 3.20 dd<br/> 3.28 ddd<br/> 2.46 br d<br/> 2.28 br dd<br/> 1.66 br ddd<br/> 1.27 br d<br/> 0.79 ddd<br/> 1.33 br d<br/> 0.87 t</p>                                                                                                                                                                                                                                                                                      |
| <p>NAME: 20S-Hydroxy-1,2-dehydropseudoaspidospermidine<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, 40, 737.<br/> NOTES:</p> | <p>MM: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 24</p> <p>2.88 (11.4, 8.4, 4.8)<br/> 3.18 (8.4, 6.7, -2)<br/> 2.82 (2.9, &lt;1)<br/> 1.82 (12.1, 4.8, 2)<br/> 2.31 (12.1, 11.4, 6.7)<br/> 7.35 (7.7, 1.4, &lt;0.5)<br/> 7.30 (7.7, 1.1)<br/> 7.17 (7.7, 1.4)<br/> 7.51 (7.7, 1.1, &lt;0.5)<br/> 2.97 (15.4, 11.0, 3.7)<br/> 2.78 (15.4, 9.9, 6.5)<br/> 3.12 (10.5, 1.8)<br/> 2.36 (10.5)<br/> 1.77 (14.8, 7.5, -0.5)<br/> 1.96 (14.8, 7.5)<br/> 0.97 (7.5, 7.5)<br/> 1.41 (13.6, 5.6, -0.5)<br/> 1.83 (13.6, 1.9, 1.8)<br/> 1.53 (12.9, 5.6, 5.6, 2.9, 1.9)<br/> 1.75 (12.2, 9.9, 5.6, 3.7, &lt;1)<br/> 2.52 (12.9, 12.2, 11.0, 6.5)</p> |

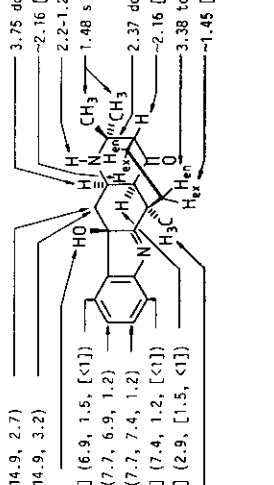
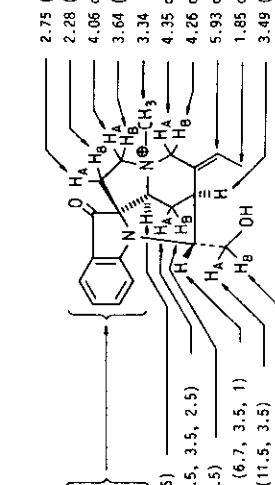
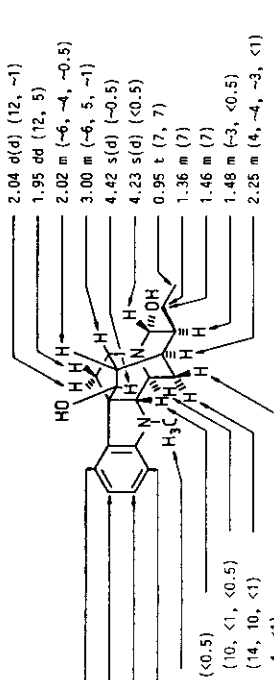
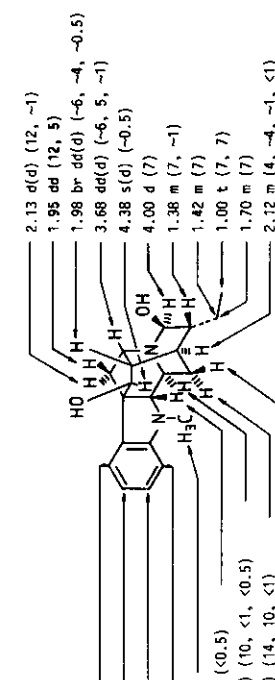
|                                                                                                                                         |                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p>NAME: (-)-Isoeburnamine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (15) X.Z. Feng et al., J. Nat. Prod., 1984, 49, 117.<br/> NOTES:</p> | <p>NAME: Isomalinidine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (24) M. Caprasse et al., Planta Med., 1984, 50, 27.<br/> NOTES: The shifts of five protons not given.</p> | <p>Mi: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 25</p>  <p>3.85 s<br/> 7.41 d<br/> 7.15 t<br/> 7.19 t<br/> 7.51 d<br/> 6.07 d<br/> 2.00 dd<br/> 2.19 d<br/> 1.47 dq<br/> 2.17 dq</p>                                                                                                          | <p>Mi: 304<br/> MF: <math>C_{20}H_{22}N_3</math><br/> NO: 27</p>  <p>7.57 d (7.75)<br/> 7.11 t (7.75, ~7.5)<br/> 7.21 t (8, ~7.5)<br/> 7.44 d (8)<br/> 3.37 m (12.5, 5)<br/> 3.97 m (18.7, 12.5)<br/> 7.48 d (5.2)<br/> 8.53 d (5.2)<br/> 5.64 m (18.7, 5)<br/> 3.11 s<br/> 1.93 d (6.9)<br/> 5.16 q (6.9)<br/> 8.57 s</p>     |
| <p>NAME: Voaphylline<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (23) P. Perera et al., Planta Med., 1983, 49, 28.<br/> NOTES:</p>          | <p>NAME: Malindine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (24) M. Caprasse et al., Planta Med., 1984, 50, 27.<br/> NOTES: The shifts of five protons not given.</p>     | <p>Mi: 296<br/> MF: <math>C_{19}H_{24}N_2O</math><br/> NO: 26</p>  <p>2.81 dd (4.7, 3.9)<br/> 2.82 dd (8.7, 3.9)<br/> 2.30 ddd (12.8, 8.7, 4.7)<br/> 2.59 dt (12.8, 3.9, 3.9)<br/> 7.23 dd (7.2, 1.6)<br/> 7.03-7.11 m<br/> 7.45 dd (7.2, 1.9)<br/> 7.85 br s<br/> 2.66 d (12.5)<br/> 3.28 d (12.5)</p> | <p>Mi: 304<br/> MF: <math>C_{20}H_{22}N_3</math><br/> NO: 26</p>  <p>7.56 d (7.75)<br/> 7.12 t (7.75, ~7.5)<br/> 7.22 t (8.0, ~7.5)<br/> 7.43 d (8.0)<br/> 3.45 m (~12, 5)<br/> 3.92 m (~18.4, ~12)<br/> 7.49 d (5.2)<br/> 8.57 d (5.2)<br/> 5.5 m (~18.4, 5)<br/> 2.94 s<br/> 5.23 q (6.6)<br/> 2.08 d (6.6)<br/> 8.72 s</p> |

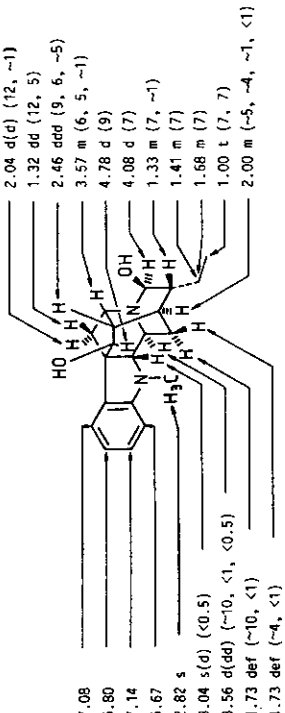
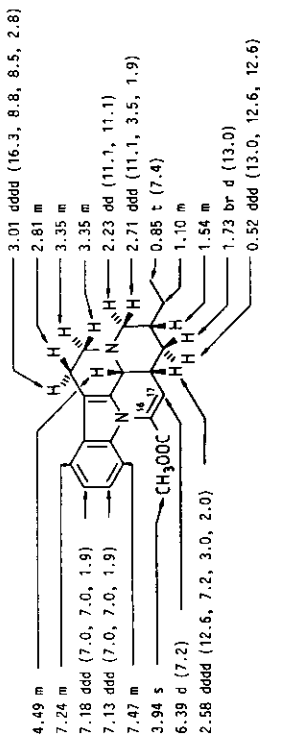
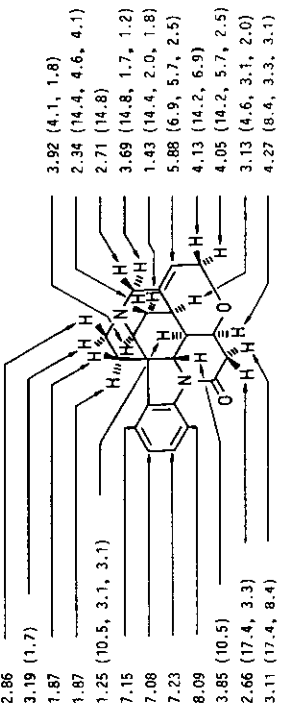
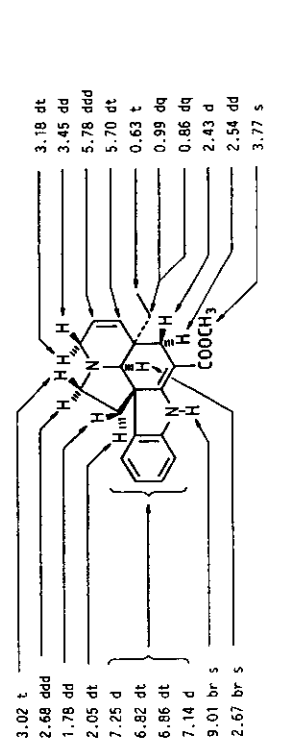
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| <p>NAME: Peduncularistine<br/> FREQUENCY: 200 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (25) R. Kyburz et al., <u>Helv. Chim. Acta</u>, 1984, <u>67</u>, 804.<br/> NOTES: Three CH<sub>3</sub>-groups at 1.44 (s), 1.25 (s) and 1.03 (s).</p> | <p>NAME: Affinisine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (16) M. Lounasmaa et al., <u>Planta Med.</u>, 1985, 519.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                     | <p>NAME: 306<br/> MF: C<sub>20</sub>H<sub>22</sub>N<sub>2</sub>O<br/> NO: 29</p>  <p>3.07 dd (16.3, 2.3)<br/> 3.01 dd (16.3, 4.9)<br/> 2.60 ddd (2.8, 1.4, 1.2)<br/> 7.50 ddd (7.9, 1.4, 0.8)<br/> 7.12 ddd (7.9, 6.6, 1.4)<br/> 7.20 ddd (8.0, 6.6, 1.4)<br/> 7.36 ddd (8.0, 1.4, 0.8)<br/> 8.00 br s<br/> 3.69 ddd (4.9, 2.8, 2.3)<br/> 1.85 br s<br/> 2.65 dd[d] (6.1, 1.4, [&lt;1])<br/> 5.64 dd (9.5, 6.1)<br/> 6.05 dd[d] (9.5, 1.2, [&lt;1])</p>                                                                 |
| <p>NAME: Strychnoxanthine<br/> FREQUENCY: 360 MHz SOLVENT: D<sub>2</sub>O<br/> REFERENCE: (26) C. Courne et al., <u>Planta Med.</u>, 1984, <u>50</u>, 93.<br/> NOTES:</p>                                                                         | <p>NAME: Aristoserratine<br/> FREQUENCY: 200/270 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (27) M.A. Hat et al., <u>Helv. Chim. Acta</u>, 1980, <u>63</u>, 2130.<br/> NOTES: Three CH<sub>3</sub>-groups at 1.38 (3H, s) and 1.19 (6H, s).</p>                                                                                                                                                                                                                                                                                                 | <p>NAME: 307<br/> MF: C<sub>19</sub>H<sub>19</sub>N<sub>2</sub>O<br/> NO: 30</p>  <p>8.16<br/> 7.42<br/> 7.70<br/> 7.64<br/> 3.25 (2.5, 2.5)<br/> 2.68 (14.8, 2, 2)<br/> 2.24 (8.6, 6.6, 5.5, 1-2)<br/> 8.57<br/> 8.57<br/> 5.36 (3, 2.8, 2.5, 2, W<sub>2</sub>=9.2)<br/> 2.76 (14.8)<br/> 2.37 (14.8, 14.6, 5.5)<br/> 2.04 (14.8, W<sub>2</sub>=11)<br/> 1.30 (15.0)<br/> 1.75 (15.0)<br/> 4.00 (11.4, 8.6)<br/> 3.89 (11.4, 6.6)</p>                                                                                 |
|                                                                                                                                                                                                                                                   | <p>NAME: 308<br/> MF: C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<br/> NO: 31</p>  <p>2.52 d(d) (15, ~1)<br/> 3.03 dd (15, 5)<br/> 7.44<br/> 7.09<br/> 7.19<br/> 7.32<br/> 3.63 s<br/> 4.18 dd (10, ~2)<br/> 2.03 dd(d) (12, 10, ~3)<br/> 1.58 dd(d) (12, ~3, ~2)<br/> 2.74 m (5, ~2, ~1)<br/> 1.74 br dd (~7, ~7, ~3, ~2)<br/> 3.44 dd (~7)<br/> 3.51 dd (~7)<br/> 3.58 def d<br/> 3.54 def d<br/> 5.37 br q (7)<br/> 1.60 d(dd) (7)<br/> 2.75 m (~3, ~3, ~3)</p> | <p>NAME: 308<br/> MF: C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<br/> NO: 32</p>  <p>2.80 dd (16.8, 1.5)<br/> 3.08 dd (16.8, 5.7)<br/> 2.35 dd (2.5, 1.3)<br/> 7.47 ddd (7.5, 1.5, 0.8)<br/> 7.09 ddd (7.5, 6.5, 1.5)<br/> 7.15 ddd (7.5, 6.5, 1.5)<br/> 7.30 ddd (7.5, 1.5, 0.8)<br/> 8.18 br s<br/> 1.65 ddd (13.8, 5.6, 2.0)<br/> 2.58 td (13.8, 13.8, 5.8)<br/> 3.79 ddd (5.7, 2.5, 1.5)<br/> 1.92 ddd (14.2, 13.8, 5.6, 3.8)<br/> ~1.5 br s<br/> 2.18 dddd (14.2, 5.8, 2.5, 2.0)<br/> 2.08 ddd (3.8, 2.5, 1.3)</p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <p>NAME: Mautensine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503. NO: 33<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                         | <p>NAME: Mavacurine<br/>FREQUENCY: 360 MHz<br/>REFERENCE: (29) M. Tits et al., <i>Planta Med.</i>, 1981, 42, 371.<br/>NOTES: The shifts of five protons not given.</p>                                                                                                                                                                                                                                                                                                                                                                                      | <p>NAME: 17-Hydroxytacamonine<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, 40, 737. NO: 36<br/>NOTES:</p>                                                                                                                                                                                                                                                                                       |
| <p>NAME: 308<br/>MF: <math>C_{20}H_{24}N_2O</math><br/>NO: 33</p>  <p>7.10<br/>6.81<br/>7.16<br/>6.66<br/>2.78 s<br/>3.07 s(d) (&lt;0.5)<br/>3.62 d(dd) (10, ~1, &lt;0.5)<br/>1.78 dd(d) (14, 10, ~1)<br/>2.05 d(d) (12, ~1)<br/>1.23 dd (12, 5)<br/>2.44 dd(d) (9, 7, ~4)<br/>2.89 dd(d) (7, 5, ~1)<br/>4.72 d (9)<br/>3.46 d (15)<br/>3.34 d (15)<br/>5.22 br q (7)<br/>1.62 br d (7)<br/>2.97 dd(d) (~4, ~4, ~1)<br/>2.08 dd(d) (14, ~4, ~1)</p> | <p>NAME: 309<br/>MF: <math>C_{20}H_{25}N_2O</math><br/>NO: 35</p>  <p>7.67<sup>a</sup> d<br/>7.31<sup>b</sup> t<br/>7.21<sup>b</sup> t<br/>7.59<sup>a</sup> d<br/>2.86 (15.5)<br/>2.54 (15.5, 4, 2)<br/>4.06 (8, 5, 1)<br/>4.20 dd (10, 5)<br/>4.11 dd (10, 8)<br/>3.86 (12)<br/>3.25<br/>3.23 (14.5)<br/>1.82 (14.5, 2)<br/>5.60 dq (6.5)<br/>1.76 dd (6.5)<br/>3.62 (2, 1)</p>                                                                                           | <p>NAME: 310<br/>MF: <math>C_{19}H_{22}N_2O_2</math><br/>NO: 36</p>  <p>4.65 m<br/>7.46 m<br/>7.33 m<br/>7.33 m<br/>8.34 br dd (7.0, 2.0)<br/>4.36 d (2.6)<br/>2.62 m<br/>2.93 m<br/>2.52 br d (16)<br/>3.37 m<br/>3.37 m<br/>2.06 dd (10.9, 10.9)<br/>2.62 br d (10.9)<br/>0.85 t (7.3)<br/>1.12 m<br/>n.o.<br/>1.66 m<br/>0.40 ddd (12.4, 12.4, 12.4)</p> |
| <p>NAME: Rosbiline<br/>FREQUENCY: 360 MHz<br/>REFERENCE: (28) M. Tits et al., <i>Phytochemistry</i>, 1980, 19, 1531.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                    | <p>NAME: 308<br/>MF: <math>C_{20}H_{24}N_2O</math><br/>NO: 34</p>  <p>2.92 (11, 8.8, 6.5)<br/>3.20 (11, 7.6, 4)<br/>2.06 (13, 6.5, 4)<br/>2.22 (13, 8.8, 7.6)<br/>7.11 d<br/>6.76 t<br/>7.12 t<br/>6.53 d<br/>5.19 d (9)<br/>4.55 d (9)<br/>3.65 (6.3)<br/>3.48<br/>1.97 td (14, ~2.5, ~2.5)<br/>3.63 (14.9)<br/>3.05 (14.9)<br/>1.80 td (14, ~3.6, ~3.6)<br/>5.33 q (6.8)<br/>1.64 d (6.8)<br/>2.73<br/>2.08 (6.8, 6.3, 3.6)<br/>3.80 (11, 6.8)<br/>3.63 (11, 3.6)</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| <p>NAME: Tasmanine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (30) R. Kyburz et al., <u>Helv. Chim. Acta</u>, 1981, 64, 2555.<br/> NOTES:</p>                                                        | <p>MM: 310<br/> MF: <math>C_{20}H_{26}N_2O</math><br/> NO: 37</p> <p>SOLVENT: <math>CDCl_3</math></p>  <p>~1.25 br s<br/> 3.77 dd[d] (6.5, 5.8, &lt;11)<br/> 1.53 ddd (14.0, ~13.8, 4.9, 4.5)<br/> 1.77 d[d] (14.3, &lt;11)<br/> 2.55 dd (14.3, 6.5)<br/> 7.38 dd[d] (7.5, 1.5, &lt;11)<br/> 6.98 dd (7.7, 7.5, 1.5)<br/> 7.16 td (7.7, 1.5)<br/> 6.84 dd[d] (7.7, 1.5, &lt;11)<br/> 8.21 br s<br/> 1.20 s &amp; 1.15 s<br/> 1.94 dd[ddd] (~13.8, 5.6, [2-3, &lt;2, 1-2])<br/> 1.31 dddd (4.5, 2-3, 2-3, 2-3, &lt;2, &lt;11)<br/> 1.56 d[d] (13.7, [2-3, 2-3])<br/> 2.11 dd[d] (13.7, 3.2, 2-3, [1-2])<br/> 2.56 [ddd] (5.8, 3.2, 2-3, &lt;2)<br/> 3.00 dd (14.0, 13.0, 5.6)<br/> 0.75 dd[dd] (13.0, 4.9, &lt;2, &lt;11)<br/> 0.88 s</p> |
| <p>NAME: Deacetyldeformakumiline<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (31) F. Guérin et al., <u>J. Nat. Prod.</u>, 1983, 46, 144.<br/> NOTES:</p>                                              | <p>MM: 322<br/> MF: <math>C_{20}H_{22}N_2O_2</math><br/> NO: 39</p> <p>SOLVENT: <math>CDCl_3</math></p>  <p>2.10 d (8)<br/> 7.45<sup>a</sup> d (7.5)<br/> 7.20<sup>b</sup> dd (7.5, 7.5)<br/> 7.36<sup>b</sup> dd (7.5, 7.5)<br/> 7.64<sup>a</sup> d (7.5)<br/> 4.77 d (5)<br/> 1.78 dd (14, 3)<br/> 2.75 br d (14)<br/> 2.63 m<br/> 2.79 m<br/> 3.75 s<br/> 2.03 dd (14, 4)<br/> 3.74 m<br/> 3.20 d (17)<br/> 4.13 dd (17, 2.5)<br/> 5.56 m<br/> 1.57 dd (7, 2.5)<br/> 3.54 m</p>                                                                                                                                                                                                                                                      |
| <p>NAME: Pericyclivine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (16) M. Lounasmaa et al., <u>Planta Med.</u>, 1985, 519.<br/> NOTES:</p>                                                           | <p>MM: 322<br/> MF: <math>C_{20}H_{22}N_2O_2</math><br/> NO: 40</p> <p>SOLVENT: <math>CDCl_3</math></p>  <p>3.23 dd (16, ~1)<br/> 2.92 dd (16, 5)<br/> 7.41<br/> 7.04<br/> 7.09<br/> 7.23<br/> 8.14 s<br/> 4.11 d (10, ~2)<br/> 1.65 dd(d) (12, 10, ~3)<br/> 2.53 ddd (12, ~4, ~2)<br/> 3.68 dd (12, 5, ~1)<br/> 3.06 s<br/> 2.82 dd (12, ~3)<br/> 3.59 def<br/> 3.56 def<br/> 5.25 br q (7)<br/> 1.60 d(dd) (7)<br/> 2.96 m (~4, ~3, ~3)</p>                                                                                                                                                                                                                                                                                           |
| <p>NAME: N<sub>5</sub>-Methylantirrhine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (24) M. Caprasse et al., <u>Planta Med.</u>, 1984, 50, 27.<br/> NOTES: The shifts of three protons not given.</p> | <p>MM: 311<br/> MF: <math>C_{20}H_{27}N_2O</math><br/> NO: 38</p> <p>SOLVENT: <math>CD_3OD</math></p>  <p>7.50 d<br/> 7.08 t<br/> 7.18 t<br/> 7.40 d<br/> 5.02 br s (<math>M_r=10</math>)<br/> 2.56 m (12, ~4.8)<br/> 2.37 m (12, ~4.8)<br/> 3.62 d (2H)<br/> 2.44 m (~9)<br/> 3.24 m (~16)<br/> 3.11 m (~16)<br/> 3.93 m (~12.4)<br/> 3.85 m (~12.4)<br/> 3.38 s<br/> 3.7 m<br/> 1.82 m (2H)<br/> 1.66 m (<math>M_r=40</math>)<br/> 5.2 m (2H)<br/> 5.7 m (~9)</p>                                                                                                                                                                                                                                                                     |

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| <p>NAME: 16-Epiaffinine<br/>FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (32) T.A. van Beek et al., <i>Phytochemistry</i>, 1984, 23, 1771.<br/>NOTES:</p>                                    | <p>MW: 324<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2</math><br/>NO: 41</p>  <p>2.67 dd (13.3, 7.9)<br/>3.32 dd (13.1, 12.0)<br/>7.52 dd (8.2, 1)<br/>7.18 ddd (8.2, 6.5, 1.8)<br/>7.42 m<br/>9.15 br s<br/>3.52 m<br/>3.47 m<br/>3.09<sup>a</sup> br t<br/>3.33<sup>a</sup> br t<br/>1.98 m (<math>M_{\text{H}}=13</math>)<br/>3.65 m<br/>3.60 m<br/>2.59 s<br/>3.73 br d (14.1)<br/>3.08 d (14.1)<br/>5.51 br q (6.9)<br/>1.70 dd (6.9, 2.0)</p>                                                              |
| <p>NAME: Ibophyllidine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (20) C. Kan et al., <i>Tetrahedron Lett.</i>, 1980, 21, 55.<br/>NOTES:</p>                                           | <p>MW: 324<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2</math><br/>NO: 43</p>  <p>3.15 m (10)<br/>2.77 d (10, 7, 7)<br/>2.2 m (7)<br/>2.27 td (7)<br/>7.50<br/>6.92<br/>7.13<br/>6.79<br/>9.12 br s<br/>3.18 m (12.5, 7, 7)<br/>1.03 t (7, 7)<br/>1.57 ddd (14, 7, 7)<br/>1.92 ddd (14, 7, 7)<br/>2.03 m (11, 7.5, 6.5, 6)<br/>1.29 dt (12.5, 12.5, 6)<br/>2.18 m (12.5)<br/>1.81 dd (15, 11)<br/>3.12 dd (15, 6.5)<br/>3.51 d (7.5)<br/>3.75 s</p>                                                                 |
| <p>NAME: 20-Epi-ibophyllidine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (20) C. Kan et al., <i>Tetrahedron Lett.</i>, 1980, 21, 55.<br/>NOTES:</p>                                    | <p>MW: 324<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2</math><br/>NO: 42</p>  <p>3.36 td (12.5, 12.5, 5.5)<br/>2.97 ddd (12.5, 6, 0.5)<br/>1.64 ddd (12.5, 5.5, 0.5)<br/>2.04 m (12.5, 12.5, 6)<br/>7.40<br/>6.87<br/>7.16<br/>6.83<br/>9.05 br s<br/>2.78 m (9, 7, 7, 6)<br/>0.96 t (7, 7)<br/>1.47 ddd (14, 7, 7)<br/>1.75 ddd (14, 7, 7)<br/>2.04 m (11.5, 6.5, 6, 0.5)<br/>1.76 br dd (12.5, 6, 0.5)<br/>1.95 br dd (12.5, 9)<br/>1.93 dd (14.5, 11.5)<br/>2.76 dd (14.5, 6)<br/>3.89 d (6.5)<br/>3.75 s</p> |
| <p>NAME: Rosicine<br/>FREQUENCY: 250 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (33) Atta-ur-Rahman et al., <i>Tetrahedron Lett.</i>, 1984, 25, 6051.<br/>NOTES: The shifts of two protons not given.</p> | <p>MW: 324<br/>MF: <math>\text{C}_{19}\text{H}_{20}\text{N}_2\text{O}_3</math><br/>NO: 44</p>  <p>2.88 dd (8.3, 6.3)<br/>2.50 m (8.3, 4.2)<br/>1.87 dd (11.6, 6.3)<br/>1.74 dd (11.6, 4.2)<br/>6.84-7.28 m<br/>2.97 d (13)<br/>3.50 dd (13, 5.2)<br/>3.38 dd (5.2, 3.8)<br/>3.17 d (3.8)<br/>1.89 m (12, 3, 2)<br/>2.38 dd (14.5, 12)<br/>2.60 dd (14.5, 2)<br/>3.78 s</p>                                                                                                                                                         |

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| <p>NAME: Triabumine<br/> FREQUENCY: 200 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (25) R. Kyburz et al., <i>Helv. Chim. Acta</i>, 1984, 67, 804. NO: 45<br/> NOTES:</p> | <p>NAME: Ajmaline<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503. NO: 47<br/> NOTES:</p> | <p>NAME: 324<br/> MF: C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<sub>2</sub><br/> NO: 45</p>  <p>2.64 dd (14.9, 2.7)<br/> 1.57 dd (14.9, 3.2)<br/> 1.25 br s<br/> 7.39 dd(d) (6.9, 1.5, &lt;11)<br/> 7.24 ddd (7.7, 6.9, 1.2)<br/> 7.36 ddd (7.7, 7.4, 1.2)<br/> 7.57 dd(d) (7.4, 1.2, &lt;11)<br/> 2.07 ddd (2.9, [1.5, &lt;11])<br/> 1.22 s<br/> 3.75 ddd (3.2, 2.9, 2.7)<br/> -2.16 [ddd (-15, 14.2, -6.5)]<br/> 2.2-1.2 br<br/> 1.48 s &amp; 1.39 s<br/> 2.37 dd[dd] (-15, 6.4, [-3, &lt;15])<br/> -2.16 [ddd (-3, 1.5, &lt;11)]<br/> 3.38 td (14.2, 6.4)<br/> -1.45 [dddd (14.2, -6.5, &lt;1.5, &lt;1, &lt;11)]</p> | <p>NAME: Isoajmaline<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503. NO: 48<br/> NOTES: 17R.</p> | <p>NAME: 325<br/> MF: C<sub>20</sub>H<sub>25</sub>N<sub>2</sub>O<sub>2</sub><br/> NO: 46</p>  <p>7.58 d<br/> 7.55 t<br/> 6.87 t<br/> 7.20 d<br/> 4.15 (2.5)<br/> 2.41 (15.5, 3.5, 2.5)<br/> 2.07 (15.5)<br/> 4.18 ddd (6.7, 3.5, 1)<br/> 4.34 dd (11.5, 3.5)<br/> 3.83 dd (11.5, 6.7)<br/> 2.75 (13.5, 13, 7)<br/> 2.28 (13.5, 7.2)<br/> 4.06 dd (12, 7)<br/> 3.64 (13, 12, 7.2)<br/> 3.34<br/> 4.35 d (14.8)<br/> 4.26 d (14.8)<br/> 5.93 q (7)<br/> 1.85 d (7)<br/> 3.49 (3.5, 1)</p>                                               |
|                                                                                                                                                                                  | <p>NAME: Ajmaline<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503. NO: 47<br/> NOTES:</p> | <p>NAME: 326<br/> MF: C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<sub>2</sub><br/> NO: 45</p>  <p>7.46<br/> 6.75<br/> 7.13<br/> 6.63<br/> 2.77 s<br/> 2.62 s(d) (&lt;0.5)<br/> 3.58 d(dd) (10, &lt;1, &lt;0.5)<br/> 1.84 dd(d) (14, 10, &lt;1)<br/> 1.48 m (14, 4, &lt;1)<br/> 2.04 d(d) (12, -1)<br/> 1.95 dd (12, 5)<br/> 2.02 m (-6, -4, -0.5)<br/> 3.00 m (-6, 5, -1)<br/> 4.42 s(d) (-0.5)<br/> 4.23 s(d) (&lt;0.5)<br/> 0.95 t (7, 7)<br/> 1.36 m (7)<br/> 1.46 m (7)<br/> 1.48 m (-3, &lt;0.5)<br/> 2.25 m (4, -4, -3, &lt;1)</p>                                                                                    | <p>NAME: Isoajmaline<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503. NO: 48<br/> NOTES: 17R.</p> | <p>NAME: 326<br/> MF: C<sub>20</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub><br/> NO: 48</p>  <p>7.45<br/> 6.78<br/> 7.17<br/> 6.66<br/> 2.78 s<br/> 2.62 s(d) (&lt;0.5)<br/> 3.37 d(dd) (10, &lt;1, &lt;0.5)<br/> 1.76 dd(d) (14, 10, &lt;1)<br/> 1.18 dd(d) (14, 4, &lt;1)<br/> 2.13 d(d) (12, -1)<br/> 1.95 dd (12, 5)<br/> 1.98 br dd(d) (-6, -4, -0.5)<br/> 3.68 dd(d) (-6, 5, -1)<br/> 4.38 s(d) (-0.5)<br/> 4.00 d (7)<br/> 1.38 m (7, -1)<br/> 1.42 m (7)<br/> 1.00 t (7, 7)<br/> 1.70 m (7)<br/> 2.12 m (4, -4, -1, &lt;1)</p> |

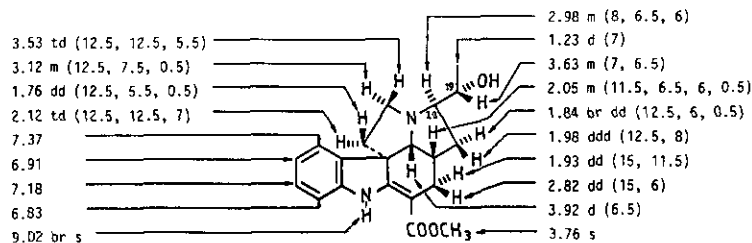
|                                                                                                                                                                                                    |                                                                                                                                                             |
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| <p>NAME: Isosandwichine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, <b>23</b>, 1503. NO: 49<br/> NOTES: 175.</p>                                  | <p>NAME: 16,17-Anhydrotacamine<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, <b>40</b>, 737.<br/> NOTES:</p> |
| <p>MF: <math>C_{21}H_{26}N_2O_2</math><br/> NO: 50</p>                                                          | <p>MF: <math>C_{21}H_{24}N_2O_2</math><br/> NO: 51</p>                     |
| <p>NAME: Strychnine<br/> FREQUENCY: 220 MHz<br/> REFERENCE: (34) E. Menkert et al., <i>J. Org. Chem.</i>, 1978, <b>43</b>, 1099.<br/> NOTES: For relaxation and NOE measurements, see Ref. 79.</p> | <p>NAME: Tabersonine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (35) R. Wen et al., <i>Heterocycles</i>, 1984, <b>22</b>, 1061.<br/> NOTES:</p>                |
| <p>MF: <math>C_{21}H_{22}N_2O_2</math><br/> NO: 50</p>                                                         | <p>MF: <math>C_{21}H_{24}N_2O_2</math><br/> NO: 52</p>                    |

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| <p>NAME: Vindoline<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (36) L.J. Durham et al., Proc. Natl. Acad. Sci. USA, NO: 53<br/>1974, 21, 3897.</p> <p>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>NAME: Isoretuline<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (19) D. Tavernier et al., Bull. Soc. Chim. Belg.,<br/>1978, 82, 595.</p> <p>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>MM: 338<br/>MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub><br/>NO: 53</p> <p>~3.40 dd (9, 8)<br/>3.29 ddd (10.5, 9, 7)<br/>2.08 q (7)<br/>1.85 ddd (16, 10.5, 9)<br/>2.17 dd (16, 7)<br/>6.7-7.4<br/>3.45 ddd (18, 3.3, 2)<br/>3.97 dd (18, 5)<br/>3.46 s<br/>5.78 ddd (10, 5, 2)<br/>6.16 dd (10, 3.3)<br/>1.80 dd (14.5, 12)<br/>2.47 dd (14.5, 6)<br/>0.96 d (7)<br/>3.04 dd (12, 6)<br/>3.70 s</p>                                                                                                                                                      | <p>MM: 338<br/>MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub><br/>NO: 53</p> <p>2.79 (12.5, -9, -4)<br/>3.21 (12.5, -10, -7)<br/>1.81 (13.2, -10, -4)<br/>2.43 (13.2, -9, -7)<br/>7.05-7.25<br/>3.52 (3.3, 2.7)<br/>1.62 (13.2, 2.7, 2.7)<br/>3.21 (13.4, 2.0, 1.8)<br/>3.52 (13.4)<br/>1.96 (13.2, 3.3, 3.3)<br/>5.51 (6.8, 1.8)<br/>1.66 (6.8, 2.0)<br/>2.80 (-4, 3.3, 2.7)<br/>3.64 (12.2, 4.2)<br/>3.58 (12.2, 5.2)<br/>4.73 (10.4)<br/>2.43<br/>1.66 (10.4, 5.2, 4.2, -4)</p>                                                                   |
| <p>NAME: Coronaridine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (37) C. Kan et al., Planta Med., 1981, 41, 72.<br/>NOTES: For reassignment of aromatic protons, see Ref. 49.</p> <p>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                 | <p>NAME: 17-O-Methylkribine<br/>FREQUENCY: 500 MHz<br/>REFERENCE: (38) R. Verpoorte et al., J. Chem. Soc., Perkin Trans. 1,<br/>1984, 1455.</p> <p>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>MM: 338<br/>MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub><br/>NO: 54</p> <p>3.15<sup>a</sup> m<br/>3.0<sup>a</sup> m<br/>7.46<br/>7.05<br/>7.17<br/>7.23<br/>7.75 br s<br/>3.54 na d (&lt;0.2)<br/>1.91 br d (12, -3)<br/>3.70 s<br/>2.58 br d (12, -3)<br/>3.2<sup>b</sup> m<br/>3.4<sup>b</sup> m<br/>2.90<sup>c</sup> br d (9, -3)<br/>2.80<sup>c</sup> br d (9, -3)<br/>1.45 dd (7, -7)<br/>1.55 dq (7, -7)<br/>0.89 t (7, 7)<br/>1.33 br dt (-40, -5, -7, -10.2)<br/>1.14 br dd (12.5, -5)<br/>1.73 br dd (12.5, -10)<br/>1.89 m (-3, -3, -3, -3)</p> | <p>MM: 338<br/>MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>2</sub><br/>NO: 56</p> <p>2.75 ddd (15.5, 5.0, 2.5, 2)<br/>2.92 ddd (15.5, 10.5, 5.0, 2.5)<br/>2.68 ddd (11.8, 10.5, 4.0)<br/>3.14 ddd (11.8, 4.0, 2.5)<br/>3.44 m<br/>2.52 s<br/>2.16 ddd (13.5, 10.2, 5.0)<br/>2.10 ddd (13.5, 3.5, 2.0)<br/>3.08 m<br/>1.78 ddd (12.9, 4.0, 1.8)<br/>2.15 ddd (12.9, 12.1, 4.0)<br/>7.48 br d (7.6)<br/>7.15 dd (7.6, 7.6)<br/>7.21 ddd (7.6, 8.1, 1.1)<br/>7.33 d (8.1)<br/>6.90 s<br/>4.54 q (6.2)<br/>1.47 d (6.2)<br/>4.89 dd (4.0, 1.8)<br/>3.45 s</p> |

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| <p>NAME: Retuline<br/>FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (19) D. Tavernier et al., <i>Bull. Soc. Chim. Belg.</i>, 1978, <b>87</b>, 595.<br/>NOTES: Rotamer a.</p>                                                                                                                                                                                                                               | <p>NAME: 18-Hydroxy-20-epi-ibophyllidine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (40) C. Kan et al., <i>Tetrahedron Lett.</i>, 1980, <b>21</b>, 3363.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>NAME: 19R-Hydroxy-20-epi-ibophyllidine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (40) C. Kan et al., <i>Tetrahedron Lett.</i>, 1980, <b>21</b>, 3363.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>MI: 338<br/>MF: <math>\text{C}_{21}\text{H}_{26}\text{N}_2\text{O}_2</math><br/>NO: 57</p> <p> <math>\delta</math> 2.80<br/> <math>\delta</math> 3.21<br/> <math>\delta</math> 1.58<br/> <math>\delta</math> 1.98<br/> <math>\delta</math> 7.05-7.25<br/> <math>\delta</math> 7.22<br/> <math>\delta</math> 8.08<br/> <math>\delta</math> 4.12 (7.2)<br/> <math>\delta</math> 2.30<br/> <math>\delta</math> 3.38 (11, 5.5) </p> | <p>MI: 340<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3</math><br/>NO: 59</p> <p> <math>\delta</math> 3.38 td (12.5, 12.5, 5)<br/> <math>\delta</math> 3.03 br dd (12.5, 6.5, 0.5)<br/> <math>\delta</math> 1.70 dd (12.5, 5.5, 0.5)<br/> <math>\delta</math> 2.1 m (12.5, 12.5, 6.5)<br/> <math>\delta</math> 7.27<br/> <math>\delta</math> 6.87<br/> <math>\delta</math> 7.15<br/> <math>\delta</math> 6.78<br/> <math>\delta</math> 9.05 br s<br/> <math>\delta</math> 3.30 m (6)<br/> <math>\delta</math> 1.62 br dd (12, 3)<br/> <math>\delta</math> 2.1 m (12, 3)<br/> <math>\delta</math> 4.03 m (12, 3)<br/> <math>\delta</math> 3.76 m (12, 3)<br/> <math>\delta</math> 2.04 m (11.5, 6.5, 6, 0.5)<br/> <math>\delta</math> 1.76 br dd (12.5, 6, 0.5)<br/> <math>\delta</math> 2.16 m (12.5)<br/> <math>\delta</math> 1.90 dd (15, 11.5)<br/> <math>\delta</math> 2.83 dd (15, 6)<br/> <math>\delta</math> 3.86 d (6.5)<br/> <math>\delta</math> 3.74 s </p>                                                                                                                                                                                                                                  | <p>MI: 340<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3</math><br/>NO: 60</p> <p> <math>\delta</math> 3.30 td (12.5, 12.5, 5.5)<br/> <math>\delta</math> 2.94 br dd (12.5, 6, 0.5)<br/> <math>\delta</math> 1.64 dd (12.5, 5.5, 0.5)<br/> <math>\delta</math> 2.05 m (12.5, 12.5, 6)<br/> <math>\delta</math> 7.29<br/> <math>\delta</math> 6.89<br/> <math>\delta</math> 7.17<br/> <math>\delta</math> 6.83<br/> <math>\delta</math> 9.03 br s<br/> <math>\delta</math> 2.90 m (8, 6)<br/> <math>\delta</math> 1.10 d (7)<br/> <math>\delta</math> 3.85 m (8, 7)<br/> <math>\delta</math> 2.04 m (11.5, 6.5, 5.5, 0.5)<br/> <math>\delta</math> 1.60 br dd (12.5, 6, 0.5)<br/> <math>\delta</math> 2.1 m (12.5)<br/> <math>\delta</math> 1.88 dd (14.5, 11.5)<br/> <math>\delta</math> 2.76 dd (14.5, 5.5)<br/> <math>\delta</math> 3.84 d (6.5)<br/> <math>\delta</math> 3.75 s </p> |
| <p>NAME: 21-Hydroxycyclochoerine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (39) W. Kohl et al., <i>Pflanz Med.</i>, 1984, <b>50</b>, 242.<br/>NOTES:</p>                                                                                                                                                                                                                                           | <p>MI: 340<br/>MF: <math>\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3</math><br/>NO: 58</p> <p> <math>\delta</math> 6.63 br s<br/> <math>\delta</math> 3.79 s<br/> <math>\delta</math> 6.68 d (8)<br/> <math>\delta</math> 7.10 d (8)<br/> <math>\delta</math> 4.42 d (8, <math>\delta</math>)<br/> <math>\delta</math> 1.30 d (15, <math>\delta</math>, <math>\delta</math>)<br/> <math>\delta</math> 1.83 dd (15, 8, <math>\delta</math>)<br/> <math>\delta</math> 1.33<sup>a</sup> br s (<math>\delta</math>, <math>\delta</math>)<br/> <math>\delta</math> 3.13 dd (15, 6)<br/> <math>\delta</math> 2.53 d (15, <math>\delta</math>)<br/> <math>\delta</math> 3.55 dd (6, 4, <math>\delta</math>)<br/> <math>\delta</math> 1.19<sup>a</sup> br s (4, <math>\delta</math>, <math>\delta</math>)<br/> <math>\delta</math> 3.41<sup>b</sup> dd (<math>\delta</math>)<br/> <math>\delta</math> 3.65<sup>b</sup> d (<math>\delta</math>)<br/> <math>\delta</math> 4.07 q (<math>\delta</math>, <math>\delta</math>)<br/> <math>\delta</math> 1.24 d (<math>\delta</math>)<br/> <math>\delta</math> 4.81 br s (<math>\delta</math>)<br/> <math>\delta</math> 1.87 br s (<math>\delta</math>, <math>\delta</math>) </p> | <p>NAME: 21-Hydroxycyclochoerine<br/>FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/>REFERENCE: (39) W. Kohl et al., <i>Pflanz Med.</i>, 1984, <b>50</b>, 242.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

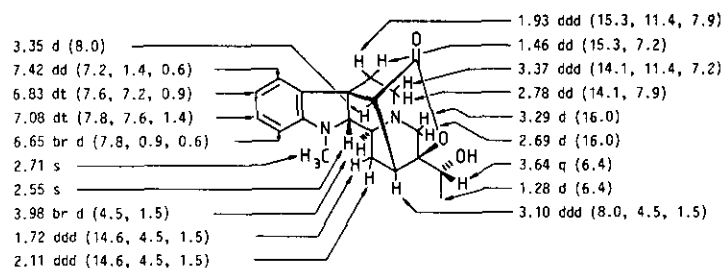
NAME: 19S-Hydroxy-20-epi-ibophyllidine  
 FREQUENCY: 400 MHz SOLVENT:  $\text{CDCl}_3$   
 REFERENCE: (40) C. Kan et al., *Tetrahedron Lett.*, 1980, 21, 3363.  
 NOTES:

MW: 340  
 MF:  $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3$   
 NO: 51



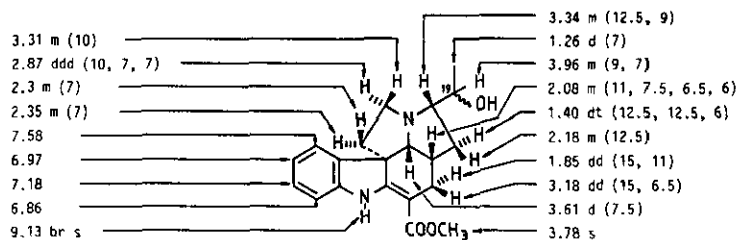
NAME: Raucubaine  
 FREQUENCY: 200 MHz SOLVENT:  $\text{CDCl}_3$   
 REFERENCE: (41) P. Sierra et al., *Collect. Czech. Chem. Commun.*, 1982, 47, 2912.  
 NOTES:

MW: 340  
 MF:  $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3$   
 NO: 63



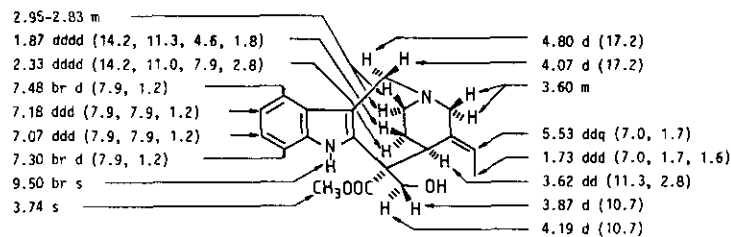
NAME: 19-Hydroxyibophyllidine  
 FREQUENCY: 400 MHz SOLVENT:  $\text{CDCl}_3$   
 REFERENCE: (40) C. Kan et al., *Tetrahedron Lett.*, 1980, 21, 3363.  
 NOTES:

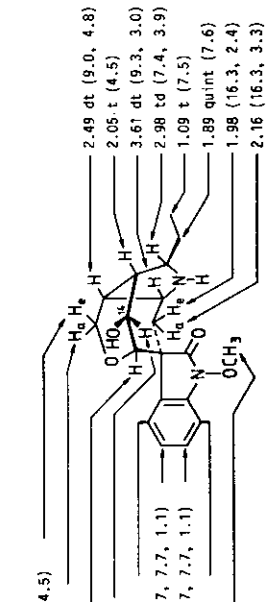
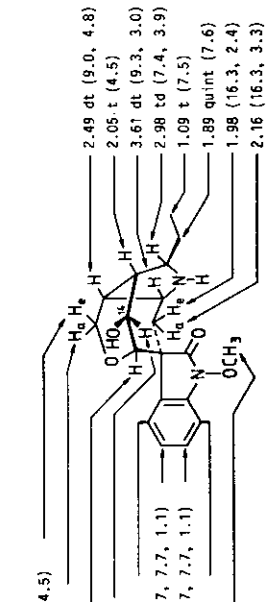
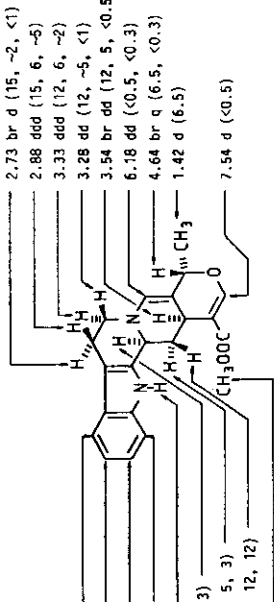
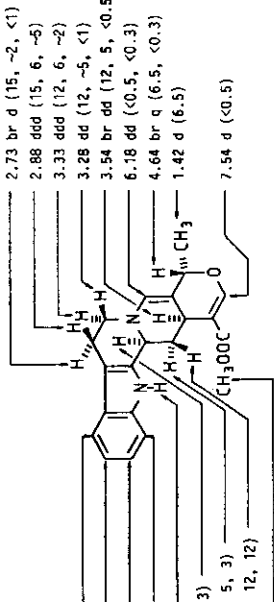
MW: 340  
 MF:  $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3$   
 NO: 62

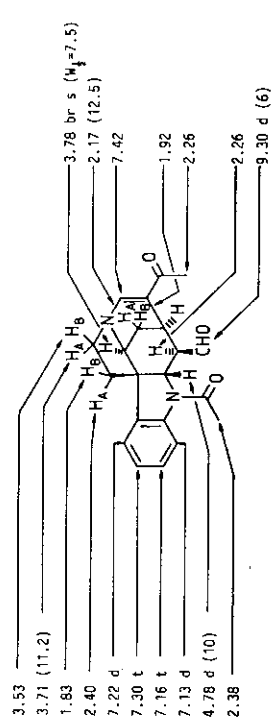
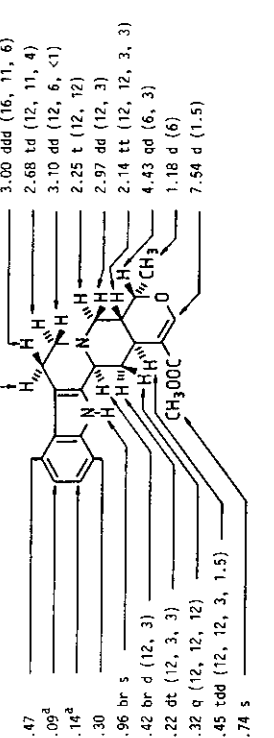
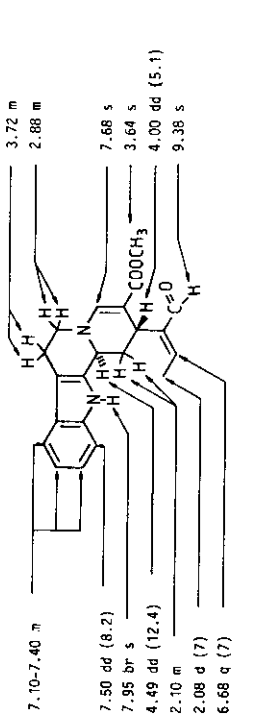
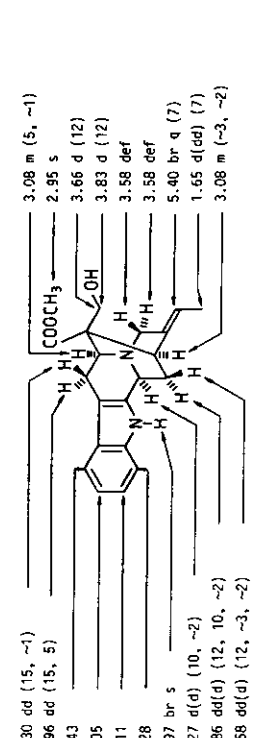


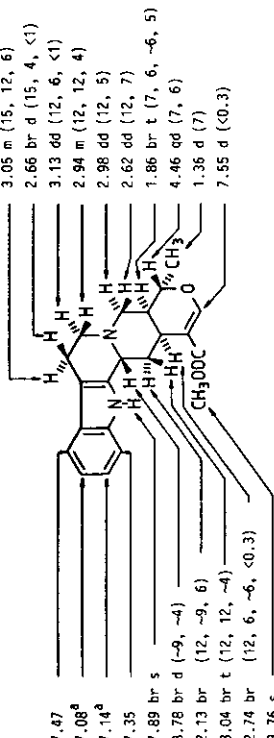
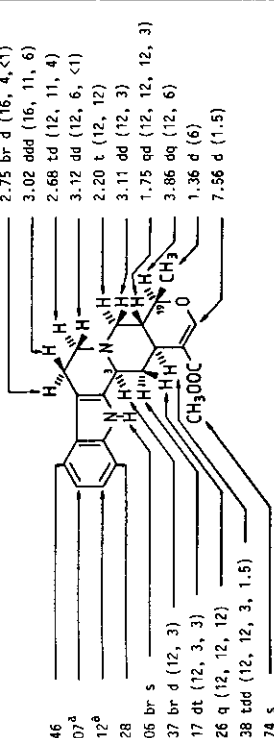
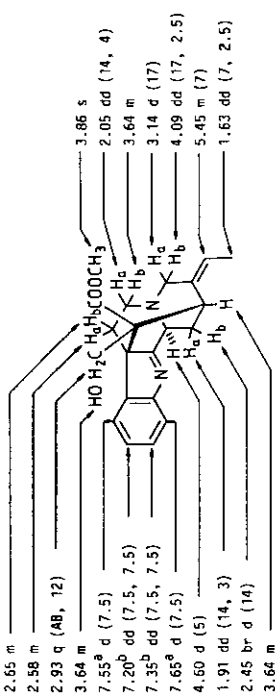
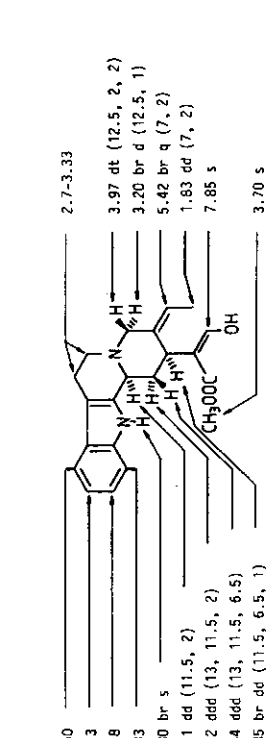
NAME: Vallesamine  
 FREQUENCY: 300 MHz SOLVENT:  $\text{CDCl}_3/\text{CD}_3\text{OD}$   
 REFERENCE: (42) P. Perera et al., *Planta Med.*, 1984, 50, 251.  
 NOTES:

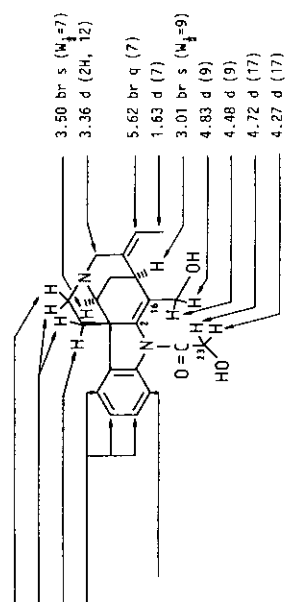
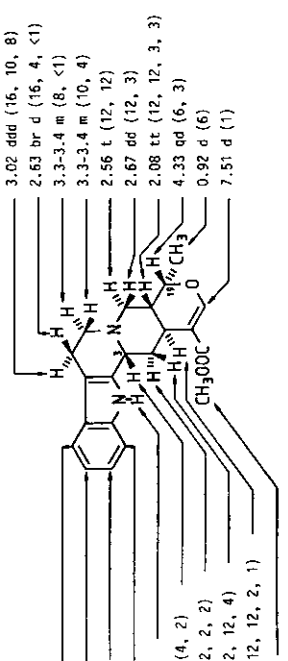
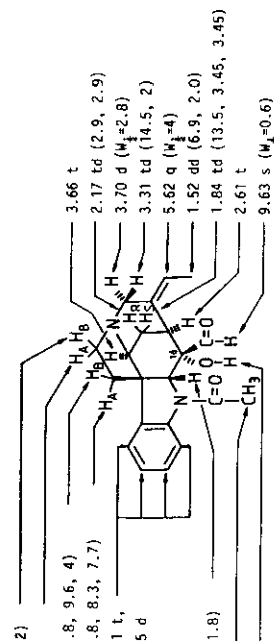
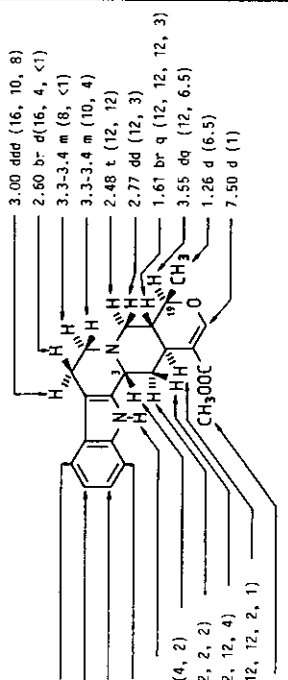
MW: 340  
 MF:  $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3$   
 NO: 64



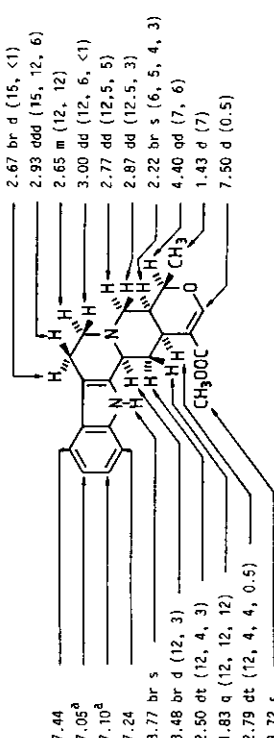
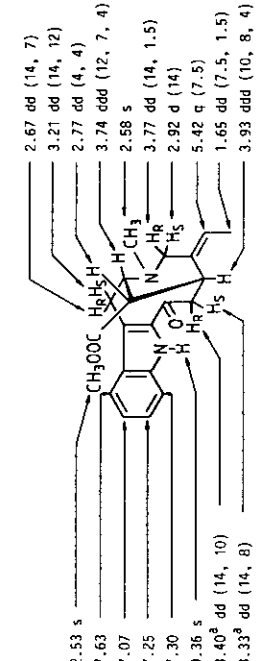
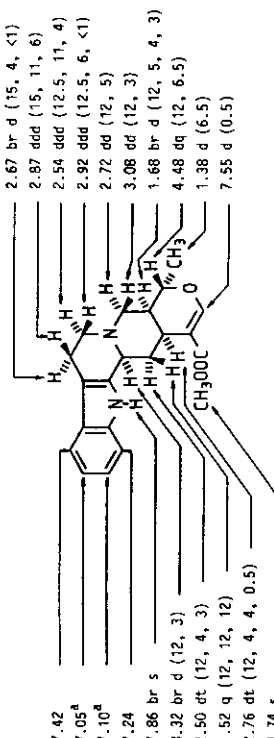
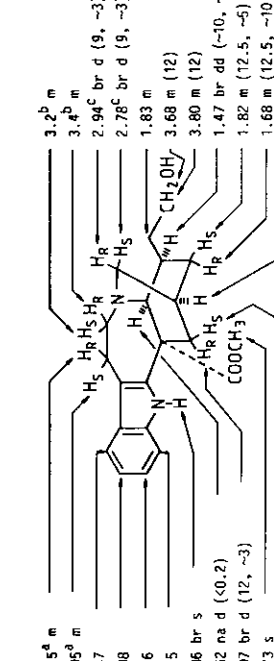
|                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NAME: 14a-Hydroxygelsedine<br/>         FREQUENCY: 360 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (43) Y. Schun and G.A. Cordell, <i>J. Nat. Prod.</i>,<br/>         1985, 49, 788.<br/>         NOTES:</p> | <p>MM: 344<br/>         MF: C<sub>19</sub>H<sub>24</sub>N<sub>2</sub>O<sub>4</sub><br/>         NO: 65</p>  <p>4.44 (11.0, 4.5)<br/>         4.31 (11.0)<br/>         3.42 s<br/>         4.42 br s<br/>         7.39 d (7.7)<br/>         7.13 ddd (7.7, 7.7, 1.1)<br/>         7.29 ddd (7.7, 7.7, 1.1)<br/>         6.95 d (7.7)<br/>         3.97 s<br/>         2.49 dt (9.0, 4.8)<br/>         2.05 t (4.5)<br/>         3.61 dt (9.3, 3.0)<br/>         2.98 td (7.4, 3.9)<br/>         1.09 t (7.5)<br/>         1.89 quint (7.6)<br/>         1.98 (16.3, 2.4)<br/>         2.16 (16.3, 3.3)</p>                                                             |
| <p>NAME: Epicatechinamine<br/>         FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (44) C. Kan et al., <i>Acta Chem. Scand.</i>, Ser. B, 1981, 35, 269.<br/>         NOTES:</p>                  | <p>MM: 350<br/>         MF: C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>3</sub><br/>         NO: 67</p>  <p>7.46<br/>         7.08<br/>         7.16<br/>         7.32<br/>         7.98 br s<br/>         4.34 dd (12, -3)<br/>         3.20 ddd (12, 5, -3)<br/>         1.48 ddd (12, 12, 12)<br/>         3.70 s<br/>         2.73 br d (15, -2, &lt;1)<br/>         2.88 ddd (15, -6, -5)<br/>         3.41 ddd (12, -6, -2)<br/>         3.30 dd (12, -5, &lt;1)<br/>         3.54 br dd (12, 5, &lt;0.5, &lt;0.5)<br/>         6.21 dd (&lt;0.5, &lt;0.5)<br/>         4.46 br q (6.5, &lt;0.5)<br/>         1.48 d (6.5)<br/>         7.64 d (&lt;0.5)</p> |
| <p>NAME: Isovallesichotamine<br/>         FREQUENCY: 90 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (45) P.G. Waterman and S. Zhong, <i>Planta Med.</i>, 1982, 45, 28.<br/>         NOTES:</p>                  | <p>MM: 350<br/>         MF: C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>3</sub><br/>         NO: 68</p>  <p>7.10-7.40 m<br/>         7.48 dd (8.2)<br/>         8.25 br s<br/>         4.28 dd (12.2)<br/>         1.86 &amp; 2.10 m<br/>         6.56 q (7)<br/>         2.18 d (7)<br/>         3.65 m<br/>         2.85 m<br/>         7.78 s<br/>         3.66 s<br/>         4.04 dd (5.1)<br/>         10.30 s</p>                                                                                                                                                                                                                                          |
| <p>NAME: Cathenamine<br/>         FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (44) C. Kan et al., <i>Acta Chem. Scand.</i>, Ser. B, 1981, 35, 269.<br/>         NOTES:</p>                       | <p>MM: 350<br/>         MF: C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>3</sub><br/>         NO: 66</p>  <p>7.46<br/>         7.08<br/>         7.16<br/>         7.32<br/>         7.98 br s<br/>         4.30 dd (12, 3)<br/>         3.18 ddd (12, 5, 3)<br/>         1.46 ddd (12, 12, 12)<br/>         3.72 s<br/>         2.73 br d (15, -2, &lt;1)<br/>         2.88 ddd (15, 6, -5)<br/>         3.33 ddd (12, 6, -2)<br/>         3.28 dd (12, -5, &lt;1)<br/>         3.54 br dd (12, 5, &lt;0.5, &lt;0.5)<br/>         6.18 dd (&lt;0.5, &lt;0.3)<br/>         4.64 br q (6.5, &lt;0.3)<br/>         1.42 d (6.5)<br/>         7.54 d (&lt;0.5)</p>    |

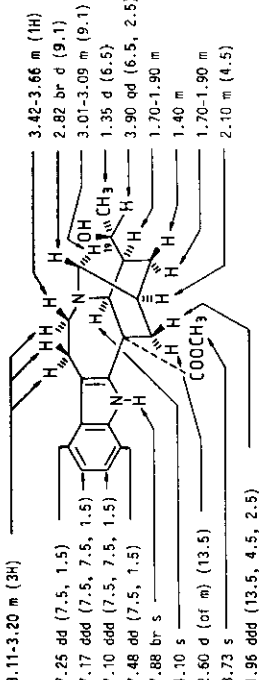
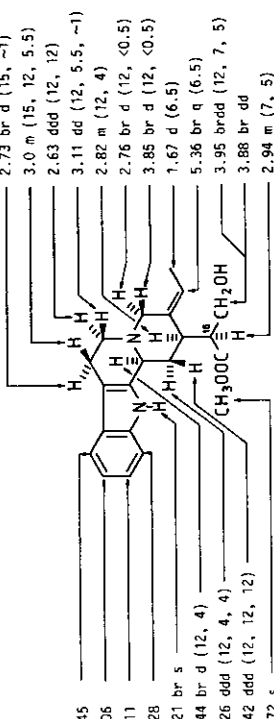
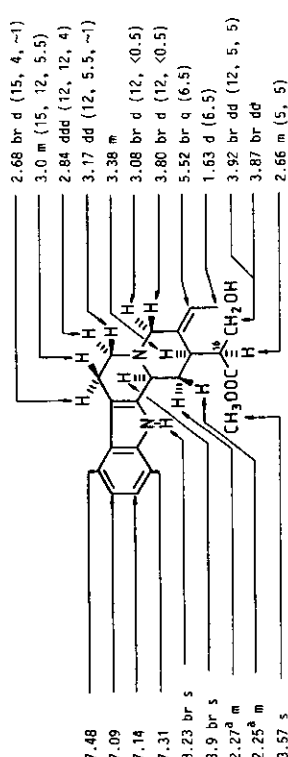
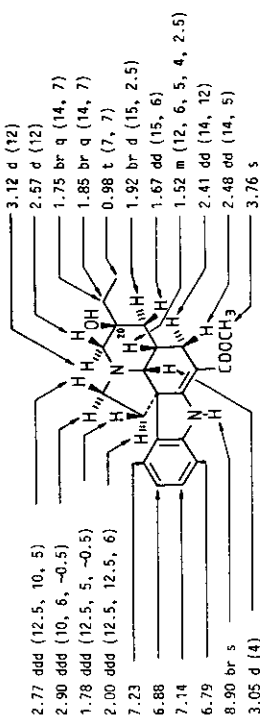
|                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <p>NAME: Strychnozairine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (46) M. Tits et al., <i>Phytochemistry</i>, 1985, 24, 205.<br/> NOTES: Rotamer b. The shift of one proton not given.</p>                                                                                                                                                                                                          | <p>NAME: Ajmalicine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1607.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                               |
| <p>MW: 350<br/> MF: <math>C_{21}H_{22}N_2O_3</math><br/> NO: 69</p>  <p>3.53<br/> 3.71 (11:2)<br/> 1.83<br/> 2.40<br/> 7.22 d<br/> 7.30 t<br/> 7.16 t<br/> 7.13 d<br/> 4.78 d (10)<br/> 2.38<br/> 3.78 br s (<math>H_f=7.5</math>)<br/> 2.17 (12.5)<br/> 7.42<br/> 1.92<br/> 2.26<br/> 2.26<br/> 9.30 d (6)</p> |  <p>7.47<br/> 7.09<sup>a</sup><br/> 7.14<sup>a</sup><br/> 7.30<br/> 7.96 br s<br/> 3.42 br d (12, 3)<br/> 3.22 ds (12, 3, 3)<br/> 1.32 q (12, 12, 12)<br/> 2.45 tdd (12, 12, 3, 1.5)<br/> 3.74 s<br/> 2.75 br d (16, 4, &lt;1)<br/> 3.00 ddd (16, 11, 6)<br/> 2.68 td (12, 11, 4)<br/> 3.10 dd (12, 6, &lt;1)<br/> 2.25 t (12, 12)<br/> 2.97 dd (12, 3)<br/> 2.14 tt (12, 12, 3, 3)<br/> 4.43 qd (6, 3)<br/> 1.18 d (6)<br/> 7.54 d (1.5)</p> |
| <p>NAME: Vallesiachotamine<br/> FREQUENCY: 90 MHz<br/> REFERENCE: (45) P.G. Waterman and S. Zheng, <i>Planta Med.</i>, 1982, 48, 28.<br/> NOTES:</p>                                                                                                                                                                                                                                               | <p>NAME: Akuammidine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (46) M. Lounasmaa et al., <i>Planta Med.</i>, 1985, 519.<br/> NOTES: Recorded at 56°C.</p>                                                                                                                                                                                                                                                                                                                                                                        |
| <p>MW: 350<br/> MF: <math>C_{21}H_{22}N_2O_3</math><br/> NO: 70</p>  <p>7.10-7.40 m<br/> 7.50 dd (8.2)<br/> 7.95 br s<br/> 4.49 dd (12.4)<br/> 2.10 m<br/> 2.08 d (7)<br/> 6.68 q (7)<br/> 3.72 m<br/> 2.88 m<br/> 7.68 s<br/> 3.64 s<br/> 4.00 dd (5.1)<br/> 9.38 s</p>                                       |  <p>3.30 dd (15, ~4)<br/> 2.96 dd (15, 5)<br/> 7.43<br/> 7.05<br/> 7.11<br/> 7.28<br/> 7.97 br s<br/> 4.27 d(d) (10, ~2)<br/> 1.86 dd(d) (12, 10, ~2)<br/> 2.68 dd(d) (12, ~3, ~2)<br/> 3.08 m (5, ~1)<br/> 2.95 s<br/> 3.66 d (12)<br/> 3.83 d (12)<br/> 3.58 def<br/> 3.58 def<br/> 5.40 br q (7)<br/> 1.65 ddd (7)<br/> 3.08 m (~3, ~2)</p>                                                                                               |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>NAME: Akaumigine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1607. NO: 73.<br/>NOTES: Recorded at 60°C.</p>                                                                                                                                                                                                                                                                                                                                                                                                           | <p>NAME: 19-Epiplajmalicine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1607. NO: 75.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>MM: 352<br/>MF: <math>C_{21}H_{24}N_2O_3</math></p>  <p>7.47<br/>7.08<sup>a</sup><br/>7.14<sup>a</sup><br/>7.35<br/>7.89 br s<br/>7.78 br d (-9, -4)<br/>2.73 br (12, -9, 6)<br/>3.04 br t (12, 12, -4)<br/>2.74 br (12, 6, -6, &lt;0.3)<br/>3.76 s</p> <p>3.05 m (15, 12, 6)<br/>2.66 br d (15, 4, &lt;1)<br/>3.13 dd (12, 6, &lt;1)<br/>2.94 m (12, 12, 4)<br/>2.98 dd (12, 5)<br/>2.62 dd (12, 7)<br/>1.86 br t (7, 6, -6, 5)<br/>4.46 dd (7, 6)<br/>1.36 d (7)<br/>7.55 d (&lt;0.3)</p> | <p>MM: 352<br/>MF: <math>C_{21}H_{24}N_2O_3</math></p>  <p>7.46<br/>7.07<sup>a</sup><br/>7.12<sup>a</sup><br/>7.28<br/>8.06 br s<br/>3.37 br d (12, 3)<br/>3.17 dt (12, 3, 3)<br/>1.26 q (12, 12, 12)<br/>2.38 tdd (12, 12, 3, 1.5)<br/>3.74 s</p> <p>2.75 br d (16, 4, &lt;1)<br/>3.02 ddd (16, 11, 6)<br/>2.68 td (12, 11, 4)<br/>3.12 dd (12, 6, &lt;1)<br/>2.20 t (12, 12)<br/>3.11 dd (12, 3)<br/>1.75 qd (12, 12, 12, 3)<br/>3.86 qd (12, 6)<br/>1.36 d (6)<br/>7.56 d (1-5)</p> |
| <p>NAME: Deacetyakauamine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (31) F. Guérin et al., <i>J. Nat. Prod.</i>, 1983, 46, 144.<br/>NOTES: See also Ref. 52.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>NAME: Geissoschizine<br/>FREQUENCY: 270 MHz<br/>REFERENCE: (48) G. Horle et al., <i>Planta Med.</i>, 1980, 48, 120.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>MM: 352<br/>MF: <math>C_{21}H_{24}N_2O_3</math></p>  <p>2.65 m<br/>2.58 m<br/>2.93 q (AB, 12)<br/>3.64 m<br/>7.55<sup>a</sup> d (7.5)<br/>7.20<sup>b</sup> dd (7.5, 7.5)<br/>7.35<sup>b</sup> dd (7.5, 7.5)<br/>7.65<sup>a</sup> d (7.5)<br/>4.60 d (5)<br/>1.91 dd (14, 3)<br/>2.45 br d (14)<br/>3.64 m</p> <p>3.86 s<br/>2.05 dd (14, 4)<br/>3.64 m<br/>3.14 d (17)<br/>4.09 dd (17, 2.5)<br/>5.45 m (7)<br/>1.63 dd (7, 2.5)</p>                                                       | <p>MM: 352<br/>MF: <math>C_{21}H_{24}N_2O_3</math></p>  <p>7.50<br/>7.13<br/>7.18<br/>7.33<br/>7.80 br s<br/>4.51 dd (11.5, 2)<br/>2.12 ddd (13, 11.5, 2)<br/>2.64 ddd (13, 11.5, 6.5)<br/>3.85 br dd (11.5, 6.5, 1)</p> <p>2.7-3.33<br/>3.97 dt (12.5, 2, 2)<br/>3.20 br d (12.5, 1)<br/>5.42 br q (7, 2)<br/>1.83 dd (7, 2)<br/>7.85 s<br/>3.70 s</p>                                                                                                                               |

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| <p>NAME: 23-Hydroxy-2,16-dehydrotretuline<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (14) G. Massiot et al., <i>Tetrahedron</i>, 1983, 39, 3645.<br/> NOTES: The shifts of four protons not given.</p>                                                                                                                                                                                                                                                                                          | <p>NAME: 3-Isoajmalicine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1607, NO: 79<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                               |
| <p>3.12 m<br/> 2.83 m<br/> 2.45 m<br/> 7.20 m<br/> 8.32 d (8)<br/> 3.50 br s (<math>M_2=7</math>)<br/> 3.36 d (2H, 12)<br/> 5.62 br q (7)<br/> 1.63 d (7)<br/> 3.01 br s (<math>M_2=9</math>)<br/> 4.83 d (9)<br/> 4.48 d (9)<br/> 4.72 d (17)<br/> 4.27 d (17)</p>                                                                                                                                                                           | <p>7.48<br/> 7.11<sup>a</sup><br/> 7.17<sup>a</sup><br/> 7.40<br/> 8.35 br s<br/> 4.56 br s (4, 2)<br/> 3.21 dt (12, 2, 2)<br/> 1.70 td (12, 12, 4)<br/> 1.98 tdd (12, 12, 2, 1)<br/> 3.73 s<br/> 3.02 ddd (16, 10, 8)<br/> 2.63 br d (16, 4, &lt;1)<br/> 3.3-3.4 m (8, &lt;1)<br/> 3.3-3.4 m (10, 4)<br/> 2.56 t (12, 12)<br/> 2.67 dd (12, 3)<br/> 2.08 tt (12, 12, 3, 3)<br/> 4.33 dd (6, 3)<br/> 0.92 d (6)<br/> 7.51 d (1)</p>           |
| <p>NAME: 16-Hydroxyisoretutinal<br/> FREQUENCY: 360 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (28) M. Tits et al., <i>Phytochemistry</i>, 1980, 19, 1531.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                          | <p>NAME: 3-Iso-19-epi-ajmalicine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1607, NO: 80<br/> NOTES: For reassignment of <math>\text{CH}_3\text{-C}(19)</math>, see Ref. 80.</p>                                                                                                                                                                                                                                               |
| <p>2.91 q (12, 2)<br/> 3.20 (12, 2)<br/> 1.92 td (13.8, 9.6, 4)<br/> 2.51 td (13.8, 8.3, 7.7)<br/> 7.10 d, 7.11 t,<br/> 7.21 t, 7.25 d<br/> 4.82 s (<math>M_2=1.8</math>)<br/> 2.41 s<br/> 3.5 s,<br/> 3.66 t<br/> 2.17 td (2.9, 2.9)<br/> 3.70 d (<math>M_2=2.8</math>)<br/> 3.31 td (14.5, 2)<br/> 5.62 q (<math>M_2=4</math>)<br/> 1.52 dd (6.9, 2.0)<br/> 1.84 td (13.5, 3.45, 3.45)<br/> 2.61 t<br/> 9.63 s (<math>M_2=0.6</math>)</p>  | <p>7.46<br/> 7.09<sup>a</sup><br/> 7.15<sup>a</sup><br/> 7.37<br/> 8.18 br s<br/> 4.52 br s (4, 2)<br/> 3.11 dt (12, 2, 2)<br/> 1.59 td (12, 12, 4)<br/> 1.94 tdd (12, 12, 2, 1)<br/> 3.70 s<br/> 3.00 ddd (16, 10, 8)<br/> 2.60 br d (16, 4, &lt;1)<br/> 3.3-3.4 m (8, &lt;1)<br/> 3.3-3.4 m (10, 4)<br/> 2.48 t (12, 12)<br/> 2.77 dd (12, 3)<br/> 1.61 br q (12, 12, 12, 3)<br/> 3.55 dq (12, 6.5)<br/> 1.26 d (6.5)<br/> 7.50 d (1)</p>  |

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| <p>NAME: 3-Isoraunittidine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, <b>36</b>, 1607. NO: 81<br/> NOTES:</p>                                                                                                                                                                                                                                  | <p>MW: 352<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 83</p> <p>NAME: Polynuridine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (16) M. Lounasmaa et al., <i>Planta Med.</i>, 1985, 519.<br/> NOTES:</p>                                                                                |
| <p>7.45<br/>7.07<sup>a</sup><br/>7.12<sup>a</sup><br/>7.28<br/>7.90 br s<br/>3.12 br d (12, 3)<br/>1.74 td (12, 12, 4)<br/>3.10 br d (12, 3, 2)<br/>3.06 br s (4, 2, 1, 1)<br/>3.75 s</p> <p>3.0 m (15, 11)<br/>2.73 br d (15, 4.5, &lt;1)<br/>3.1 m (11, &lt;1)<br/>2.62 td (11, 11, 4.5)<br/>3.00 dd (11.5, 4)<br/>2.36 t (11.5, 4, 1, 1)<br/>2.29 br d (11.5, 4, 1, 1)<br/>4.14 br q (6, 1)<br/>1.36 d (6)<br/>7.63 d (1)</p> | <p>2.98 d(d) (16, ~1)<br/>3.12 dd (15, 6)<br/>7.48<br/>7.10<br/>7.16<br/>7.33<br/>8.20 br s<br/>4.09 dd (10, 4)<br/>1.90 odd (14, 10, 3)<br/>1.83 odd (14, 4, ~3)</p> <p>4.32 d(d) (6, ~1)<br/>3.58 d (12)<br/>3.68 d (12)<br/>3.72 s<br/>3.64 br d (~16)<br/>3.53 br d (~16)<br/>5.26 br q (7)<br/>1.59 d(dd) (7)<br/>3.18 dd (3, ~3)</p> |
| <p>NAME: 3-Oxocoronaridine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (22) X.Z. Feng et al., <i>Planta Med.</i>, 1982, <b>48</b>, 212.<br/> NOTES: For reassignments, see Ref. 81.</p>                                                                                                                                                                                                                    | <p>MW: 352<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 82</p> <p>NAME: Quebrachidine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, <b>23</b>, 1503.<br/> NOTES:</p>                                                                  |
| <p>3.2<sup>a</sup> m<br/>3.1<sup>a</sup> m<br/>7.50<br/>7.10<br/>7.15<br/>7.25<br/>7.96 br s<br/>4.51 na d (&lt;0.2)<br/>2.32 br d (12, ~3)<br/>3.73 s<br/>2.64 br d (12)</p> <p>3.3<sup>b</sup> m<br/>4.5<sup>b</sup> m<br/>1.44 dq (7, ~7)<br/>1.54 dq (7, ~7)<br/>0.98 t (7)<br/>1.77 m (~7, ~7, &lt;0.2)<br/>2.01<sup>c</sup> m (~12)<br/>1.42<sup>c</sup> m (~12)<br/>2.63 m (~3)</p>                                       | <p>7.16<br/>6.74<br/>7.05<br/>6.72<br/>3.67 d (5)<br/>3.30 dd(d) (10, 5, ~1)<br/>1.42 dd(d) (14, 10, ~2)<br/>2.49 dd(d) (14, ~5, ~1)</p> <p>1.65 d(d) (12, ~1)<br/>2.55 dd (12, 5)<br/>3.63 s<br/>3.44 d(d) (5, ~1)<br/>4.18 s<br/>3.25 def<br/>3.23 def<br/>5.22 br q (7)<br/>1.58 br d (7)<br/>3.43 d(d) (~5, ~2)</p>                    |

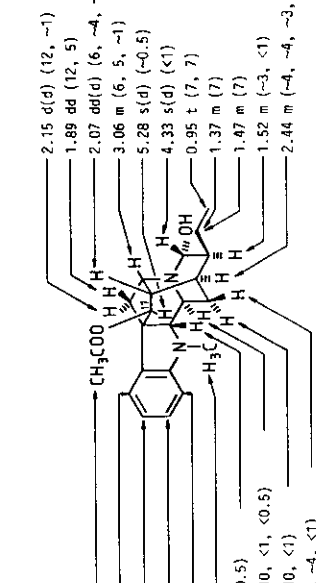
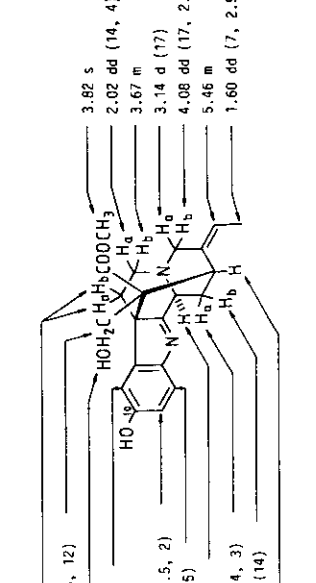
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| <p>NAME: Rauniticine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1807.<br/> NOTES: Recorded at 60°C.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>NAME: Vobasine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (49) X.-Z. Feng et al., <i>J. Nat. Prod.</i>, 1981, 44, 670.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>MM: 352<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 85</p>  <p>7.44<br/> 7.05<sup>a</sup><br/> 7.10<sup>a</sup><br/> 7.24<br/> 8.77 br s<br/> 3.48 br d (12, 3)<br/> 2.50 dt (12, 4, 3)<br/> 1.83 q (12, 12, 12)<br/> 2.79 dt (12, 4, 0.5)<br/> 3.72 s</p> <p>2.67 br d (15, &lt;1)<br/> 2.93 ddd (15, 12, 6)<br/> 2.65 m (12, 12)<br/> 3.00 dd (12, 6, &lt;1)<br/> 2.77 dd (12.5, 5)<br/> 2.87 dd (12.5, 3)<br/> 2.22 br s (6, 5, 4, 3)<br/> 4.40 dd (7, 6)<br/> 1.43 d (7)<br/> 7.50 d (0.5)</p>                 | <p>MM: 352<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 85</p>  <p>2.53 s<br/> 7.63<br/> 7.07<br/> 7.25<br/> 7.30<br/> 9.36 s<br/> 3.40<sup>a</sup> dd (14, 10)<br/> 3.33<sup>a</sup> dd (14, 8)<br/> 2.67 dd (14, 7)<br/> 3.21 dd (14, 12)<br/> 2.77 dd (4, 4)<br/> 3.74 ddd (12, 7, 4)<br/> 2.58 s<br/> 3.77 dd (14, 1.5)<br/> 2.92 d (14)<br/> 5.42 q (7.5)<br/> 1.65 dd (7.5, 1.5)<br/> 3.93 ddd (10, 8, 4)</p>                                                                                                                               |
| <p>NAME: Tetrahydroalstonine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (47) M. Lounasmaa and S.-K. Kan, <i>Tetrahedron</i>, 1980, 36, 1807.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>NAME: Albifloranine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (37) C. Kan et al., <i>Planta Medica</i>, 1981, 41, 72.<br/> NOTES: For reassignment of aromatic protons, see Ref. 49.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>MM: 352<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 86</p>  <p>7.42<br/> 7.05<sup>a</sup><br/> 7.10<sup>a</sup><br/> 7.24<br/> 7.86 br s<br/> 3.32 br d (12, 3)<br/> 2.50 dt (12, 4, 3)<br/> 1.52 q (12, 12, 12)<br/> 2.76 dt (12, 4, 0.5)<br/> 3.74 s</p> <p>2.67 br d (15, 4, &lt;1)<br/> 2.87 ddd (15, 11, 6)<br/> 2.54 ddd (12.5, 11, 4)<br/> 2.92 ddd (12.5, 6, &lt;1)<br/> 2.72 dd (12, 5)<br/> 3.08 dd (12, 3)<br/> 1.68 br d (12, 5, 4, 3)<br/> 4.48 dq (12, 6.5)<br/> 1.38 d (6.5)<br/> 7.55 d (0.5)</p> | <p>MM: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 88</p>  <p>3.15<sup>a</sup> m<br/> 3.05<sup>a</sup> m<br/> 7.47<br/> 7.08<br/> 7.16<br/> 7.25<br/> 7.86 br s<br/> 3.62 na d (&lt;0.2)<br/> 1.97 br d (12, ~3)<br/> 3.73 s<br/> 2.60 br d (12, ~3)</p> <p>3.2<sup>b</sup> m<br/> 3.4<sup>b</sup> m<br/> 2.94<sup>c</sup> br d (9, ~3)<br/> 2.78<sup>c</sup> br d (9, ~3)<br/> 1.83 m<br/> 3.68 m (12)<br/> 3.80 m (12)<br/> 1.47 br dd (~10, ~5, &lt;0.2)<br/> 1.82 m (12.5, ~5)<br/> 1.68 m (12.5, ~10)<br/> 1.95 m (~3, ~3, ~3, ~3)</p> |

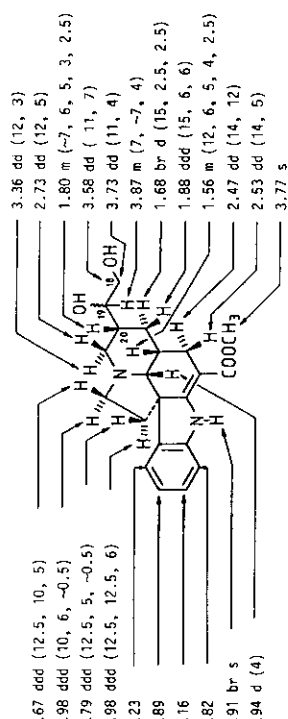
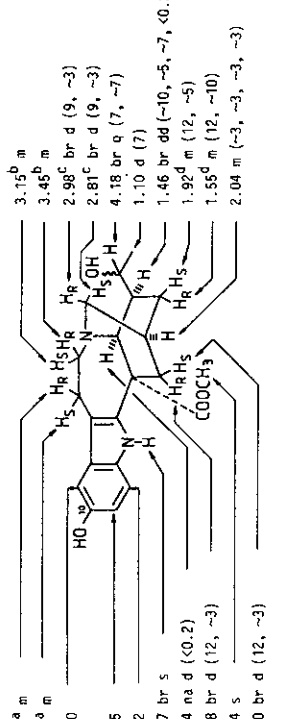
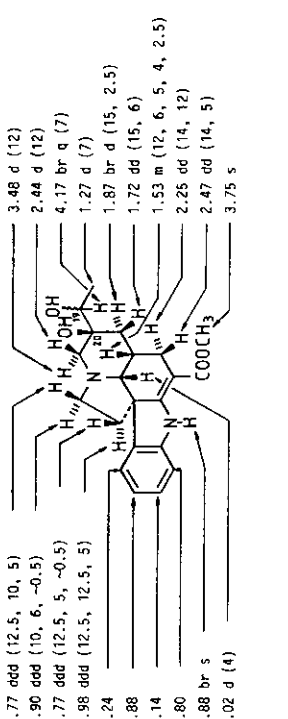
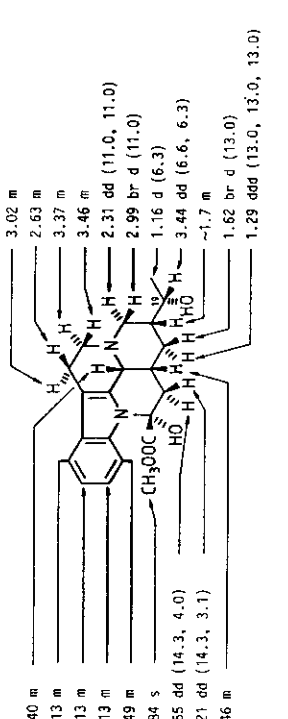
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| <p>NAME: 19R-Ephedrine<br/> FREQUENCY: 300 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (42) P. Perera et al., <i>Planta Med.</i>, 1984, 50, 251.<br/> NOTES:</p>              | <p>MM: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 89</p>  |
| <p>NAME: 16-Epi-Z-isositsirikine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (44) C. Kan et al., <i>Acta Chem. Scand.</i>, 1981, 35, 269.<br/> NOTES:</p> | <p>MM: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 91</p>    |
| <p>NAME: 16-Epi-E-isositsirikine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (44) C. Kan et al., <i>Acta Chem. Scand.</i>, 1981, 35, 269.<br/> NOTES:</p> | <p>MM: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 90</p>  |
| <p>NAME: (+)-20-Epipandoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (50) C. Kan et al., <i>Planta Med.</i>, 1981, 41, 195.<br/> NOTES:</p>           | <p>MM: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 92</p>   |

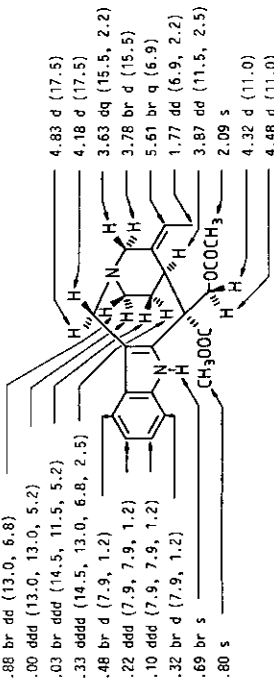
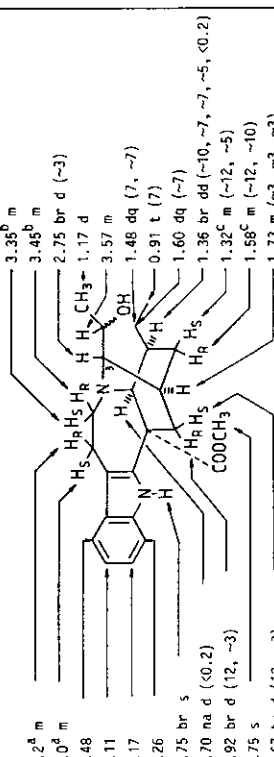
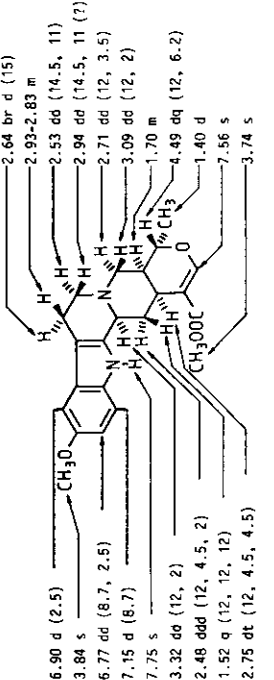
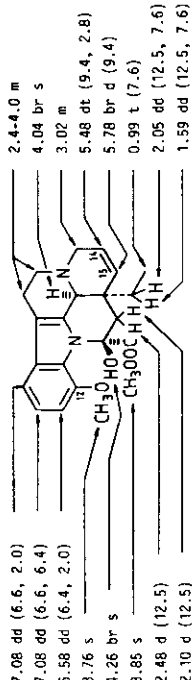
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| <p>NAME: 16-Epitacamine<br/> FREQUENCY: 300 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (18) T.A. van Beek et al., Tetrahedron, 1984, 40, 737. NO: 93<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                              | <p>NAME: 3R-Hydroxycoronaridine<br/> FREQUENCY: 400 MHz SOLVENT: -<br/> REFERENCE: (51) L. Le Men-Olivier et al., Bull. Soc. Chim. Fr., 1985, 94.<br/> NOTES: The shift of the COOCH<sub>3</sub> group not given.</p>                                                                                                                                    | <p>NAME: E-Isositsirikine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (44) C. Kan et al., Acta Chem. Scand., Ser. B, 1981, 35, 289. NO: 96<br/> NOTES:</p>                                                                                                                                                                                                                                        |
| <p>4.11 m<br/> 7.42 m<br/> 7.10 m<br/> 7.10 m<br/> 7.42 m<br/> 3.67 s<br/> 2.67 dd (14.9, 2.9)<br/> 2.22 dd (14.9, 4.2)<br/> 2.08 m<br/> 2.90 m<br/> 2.48 m<br/> 3.02 m<br/> 3.07 m<br/> 2.06 dd (10.9, 10.9)<br/> 2.43 br d (10.9)<br/> 0.77 t (7.3)<br/> 0.98 m<br/> 1.30 m<br/> 1.31 m<br/> 0.69 ddd (12.7, 12.7, 12.7)</p>                                                                                                                                                       | <p>3.55 dt (13, 5)<br/> 3.20 dt (13, 7)<br/> 3.1 m (2H)<br/> 7.5<sup>a</sup> (8)<br/> 7.16<sup>b</sup> (8)<br/> 7.1<sup>b</sup> (8)<br/> 7.27<sup>a</sup> (8)<br/> 7.85 s<br/> 3.8 s<br/> 2.75 dd (13, 1)<br/> 1.85 ddd (13, 3, 1)<br/> 4.10 br d (1.5)<br/> 1.62 m<br/> 1.5 m<br/> 0.9 t (7)<br/> 1.3 m<br/> 1.5 m<br/> 2.0 br s (M<sub>n</sub>=10)</p> | <p>7.48<br/> 7.10<br/> 7.17<br/> 7.38<br/> 8.67 br s<br/> 4.31 br s<br/> 2.26<sup>a</sup> m<br/> 2.22<sup>a</sup> m<br/> 3.67 s<br/> 2.65 br d (15, 4, ~1)<br/> 3.0 m (15, 12, 5.5)<br/> 3.15 ddd (12, 12, 4)<br/> 3.27 dd (12, 5.5, ~1)<br/> 3.10 m<br/> 3.54 br d (12, &lt;0.5)<br/> 2.93 br d (12, &lt;0.5)<br/> 5.64 br q (6.5)<br/> 1.67 d (6.5)<br/> 3.55 br dd (12, 7, 5)<br/> 3.50 br dd<br/> 2.52 m (7, 5)</p> |
| <p>NAME: Heyneanine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (37) C. Kan et al., Planta Med., 1981, 41, 72.<br/> NOTES: For reassignment of aromatic protons, see Ref. 49.</p>                                                                                                                                                                                                                                                                              | <p>NAME: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 94</p>                                                                                                                                                                                                                                                             | <p>NAME: 354<br/> MF: C<sub>21</sub>H<sub>26</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 96</p>                                                                                                                                                                                                                                                                                                                            |
| <p>3.1<sup>a</sup> m<br/> 3.05<sup>a</sup> m<br/> 7.48<br/> 7.10<br/> 7.18<br/> 7.27<br/> 7.83 br s<br/> 3.86 na d (&lt;0.2)<br/> 1.98 br d (12, ~3)<br/> 3.73 s<br/> 2.60 br d (12, ~3)<br/> 3.15<sup>b</sup> m<br/> 3.45<sup>b</sup> m<br/> 2.98<sup>c</sup> br d (9, ~3)<br/> 2.81<sup>c</sup> br d (9, ~3)<br/> 1.10 d (7)<br/> 4.17 br q (7, ~7)<br/> 1.47 br dd (~10, ~7, ~5, &lt;0.2)<br/> 1.92 br dd (12.5, ~5)<br/> 1.56 br dd (12.5, ~10)<br/> 2.03 m (~3, ~3, ~3, ~3)</p> |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <p>NAME: Z-Isositsirikine<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (44) C. Kan et al., Acta Chem. Scand., Ser. B, 1981, 35, 269, NO: 97<br/> NOTES:</p>                                                                                                                                                                                                                                                                              | <p>NAME: Raucubainine<br/> FREQUENCY: 200 MHz SOLVENT:<br/> REFERENCE: (41) P. Sierra et al., Collect. Czech. Chem. Commun. NO: 99<br/> 1982, 47, 2912.<br/> NOTES: Also known as quaternoxine, see Ref. 82.</p>                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>7.48<br/> 7.10<br/> 7.16<br/> 7.33<br/> 7.91 br s<br/> 3.64 br d (12, 4)<br/> 2.17 ddd (12, 4, 4)<br/> 1.72 ddd (12, 12, 12)<br/> 3.76 s</p> <p>2.76 br d (15, ~1)<br/> 3.0 m (15, 12, 5.5)<br/> 2.74 m (12, 12)<br/> 3.19 dd (12, 5.5, ~1)<br/> 2.66 m (12, 4)<br/> 2.91 br d (12, &lt;0.5)<br/> 3.82 br d (12, &lt;0.5)<br/> 1.74 d (6.5)<br/> 5.48 br q (6.5)<br/> 3.94 br dd (12, 7, 5)<br/> 3.85 br dd<br/> 3.01 m (7, 5)</p>                         | <p>2.97 d (3.9)<br/> 7.05 dd (7.4, 1.1, 0.5)<br/> 6.72 dt (7.6, 7.4, 0.8)<br/> 7.12 dt (7.8, 7.6, 1.1)<br/> 6.63 br d (7.8, 0.8, 0.5)<br/> 2.70 s<br/> 2.51 s<br/> 4.12 br d (4.9, 1.5)<br/> 1.69 ddd (14.8, 4.5, 1.5)<br/> 2.70 (14.8, 4.9)</p> <p>2.65 (14.5, 13.4, 6.5)<br/> 1.63 dd (14.5, 4.6)<br/> 3.76 s<br/> 3.83 ddd (13.4, 13.4, 4.6)<br/> 2.52 dd (13.4, 6.5)<br/> 3.49 d (15.7)<br/> 2.28 d (15.7)<br/> 3.06 q (5.8)<br/> 1.28 d (5.8)<br/> 2.70 (3.9)</p>                                                                                                                                                |
| <p>NAME: (+)-Pandoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (50) C. Kan et al., Planta Med., 1981, 41, 185.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                      | <p>NAME: Tacamine<br/> FREQUENCY: 300 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (18) T. A. van Beek et al., Tetrahedron, 1980, 40, 737.<br/> NOTES: See also Ref. 83.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>2.79 ddd (12.5, 10, 5)<br/> 2.95 ddd (10, 6, ~0.5)<br/> 1.81 ddd (12.5, 5, ~0.5)<br/> 2.06 ddd (12.5, 12.5, 6)<br/> 7.23<br/> 6.89<br/> 7.16<br/> 6.83<br/> 8.94 br s<br/> 2.89 d (4)</p> <p>2.98 d (12)<br/> 2.57 d (12)<br/> 1.47 br q (14, 7)<br/> 1.54 br q (14, 7)<br/> 0.96 t (7, 7)<br/> 1.87 br d (15, 2.5)<br/> 1.58 dd (15, 6)<br/> 1.52 m (12, 6, 5, 4, 2.5)<br/> 2.59<sup>a</sup> m (~14, 12)<br/> 2.61<sup>a</sup> m (~14, 5)<br/> 3.77 s</p> | <p>4.35 ddd (5.8, 2.3, 1.9, &lt;0.5)<br/> 7.12 m<br/> 7.12 m<br/> 7.12 m<br/> 7.48 m<br/> 3.83 s<br/> at 500 MHz: br s at 4.55<br/> 2.82 dd (14.3, 4.2)<br/> 2.79 dd (14.3, 3.1)<br/> 2.40 dddd (12.7, 5.8, 4.2, 4.0, 3.1)</p> <p>3.00 dddd (16.3, 11.2, 6.5, 2.3)<br/> 2.59 dddd (16.3, 5.5, 1.9, 0.6)<br/> 3.34 ddd (14.0, 6.5, 0.6)<br/> 3.43 ddd (14.0, 11.2, 5.5)<br/> 2.15 dd (10.9, 10.7)<br/> 2.66 ddd (10.9, 3.5, 1.6)<br/> 0.96 t (7.3)<br/> 1.20 ddd (~14, 7.3, ~6.5)<br/> 1.48 dddd (12.6, 10.7, ~6.5, ~6.5, 3.5, 3.0)<br/> 1.67 dddd (13.2, 4.0, 3.0, 1.6, &lt;0.5)<br/> 1.14 ddd (13.2, 12.7, 12.6)</p> |



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| <p>NAME: Voachalotine<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (16) M. Lounasmaa et al., <i>Planta Med.</i>, 1985, 519.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                 | <p>NAME: N<sub>3</sub>-Acetyl-0-methylstrychnopendine<br/> FREQUENCY: 360 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (55) M. Caprasse and L. Angenot, <i>Planta Med.</i>, 1981, 42, 364.<br/> NOTES: The shift of the N-acetyl group not given.</p>                                                                                                                                                                                                                           |
| <p>NAME: 17-O-Acetylajmaline<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503.<br/> NOTES: Recorded at 52°C.</p>                                                                                                                                                                                                                                                                                                                                  | <p>NAME: 10-Hydroxydeacetylakuammine<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (31) F. Guérin et al., <i>J. Nat. Prod.</i>, 1983, 46, 144.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                               |
| <p>NAME: 368<br/> MF: C<sub>22</sub>H<sub>28</sub>N<sub>2</sub>O<sub>3</sub><br/> NO: 106</p>  <p>2.95 d(d) (16, ~1)<br/> 3.11 dd (16, 6)<br/> 7.49<br/> 7.09<br/> 7.19<br/> 7.30<br/> 3.61 s<br/> 4.15 dd (10, 4)<br/> 1.97 ddd (14, 10, 3)<br/> 1.79 ddd (14, 4, ~3)</p> <p>4.28 d(d) (6, ~1)<br/> 3.67 def<br/> 3.67 def<br/> 3.72 s<br/> 3.67 br d (~16)<br/> 3.56 br d (~16)<br/> 5.31 br q (7)<br/> 1.62 d(dd) (7)<br/> 3.22 dd (3, ~3)</p> | <p>NAME: 368<br/> MF: C<sub>21</sub>H<sub>24</sub>N<sub>2</sub>O<sub>4</sub><br/> NO: 108</p>  <p>2.64 m<br/> 3.00 q (48, 12)<br/> 3.67 m<br/> 6.97 d (2)<br/> 6.70 dd (7.5, 2)<br/> 7.37 d (7.5)<br/> 4.56 d (5)<br/> 1.90 dd (14, 3)<br/> 2.42 br d (14)<br/> 3.67 m</p> <p>3.82 s<br/> 2.02 dd (14, 4)<br/> 3.67 m<br/> 3.14 d (17)<br/> 4.08 dd (17, 2.5)<br/> 5.46 m<br/> 1.60 dd (7, 2.5)</p> |

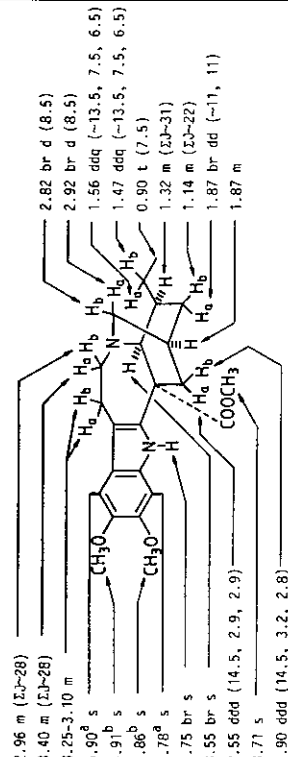
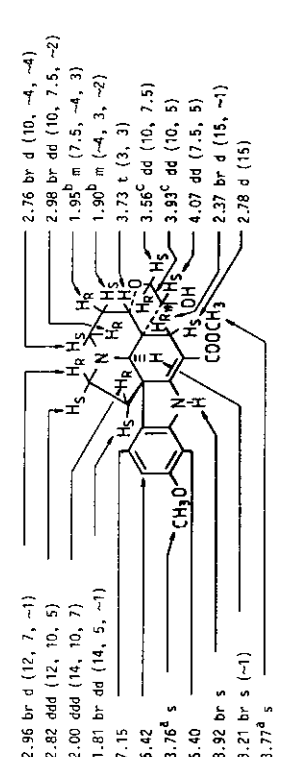
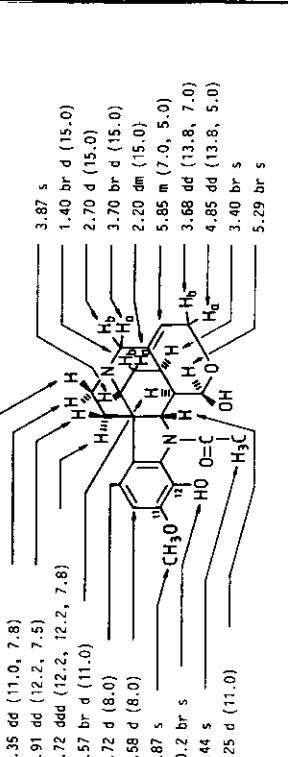
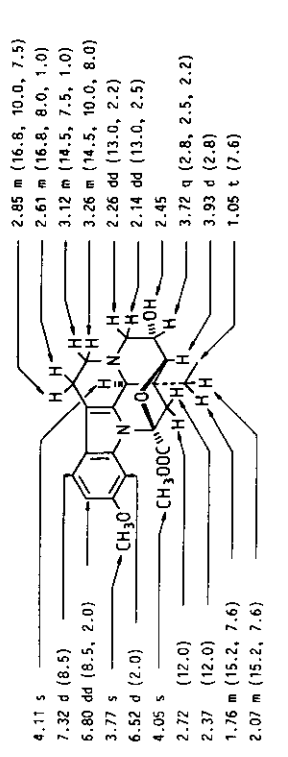
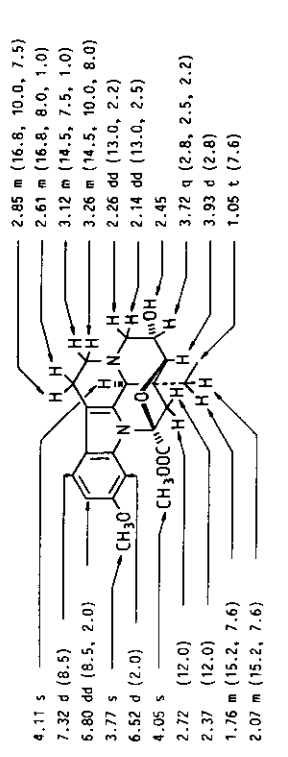
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| <p>NAME: 20R-18,19-Dihydroxypseudovincadifformine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (50) C. Kan et al., <i>Planta Med.</i>, 1981, 41, 195.<br/> NOTES:</p> | <p>MM: 370<br/> MF: <math>\text{C}_{21}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 109</p>  <p>2.67 ddd (12.5, 10, 5)<br/> 2.98 ddd (10, 6, -0.5)<br/> 1.79 ddd (12.5, 5, -0.5)<br/> 1.98 ddd (12.5, 12.5, 6)<br/> 7.23<br/> 6.89<br/> 7.16<br/> 6.82<br/> 8.91 br s<br/> 2.94 d (4)<br/> 3.36 dd (12, 3)<br/> 2.73 dd (12, 5)<br/> 1.80 m (-7, 6, 5, 3, 2.5)<br/> 3.58 dd (11, 7)<br/> 3.73 dd (11, 4)<br/> 3.87 m (7, -7, 4)<br/> 1.68 br d (15, 2.5, 2.5)<br/> 1.88 ddd (15, 6, 6)<br/> 1.56 m (12, 6, 5, 4, 2.5)<br/> 2.47 dd (14, 12)<br/> 2.53 dd (14, 5)<br/> 3.77 s</p> |
| <p>NAME: 10-Hydroxyheynanine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (22) X.Z. Feng et al., <i>Planta Med.</i>, 1982, 44, 212.<br/> NOTES:</p>                   | <p>MM: 370<br/> MF: <math>\text{C}_{21}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 111</p>  <p>3.1<sup>a</sup> m<br/> 3.0<sup>b</sup> m<br/> 6.90<br/> 6.75<br/> 7.12<br/> 7.67 br s<br/> 3.84 na d (&lt;0.2)<br/> 1.98 br d (12, -3)<br/> 3.74 s<br/> 2.60 br d (12, -3)<br/> 3.15<sup>b</sup> m<br/> 3.45<sup>b</sup> m<br/> 2.98<sup>c</sup> br d (9, -3)<br/> 2.81<sup>c</sup> br d (9, -3)<br/> 4.18 br q (7, -7)<br/> 1.10 d (7)<br/> 1.46 br dd (-10, -5, -7, &lt;0.2)<br/> 1.92<sup>d</sup> m (12, -5)<br/> 1.55<sup>d</sup> m (12, -10)<br/> 2.04 m (-3, -3, -3)</p>    |
| <p>NAME: 19-Hydroxytacamine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (18) T.A. van Beek et al., <i>Tetrahedron</i>, 1984, 40, 737.<br/> NOTES:</p>                | <p>MM: 370<br/> MF: <math>\text{C}_{21}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 112</p>  <p>4.40 m<br/> 7.13 m<br/> 7.13 m<br/> 7.13 m<br/> 7.49 m<br/> 3.84 s<br/> 2.65 dd (14.3, 4.0)<br/> 2.21 dd (14.3, 3.1)<br/> 2.46 m<br/> 3.02 m<br/> 2.63 m<br/> 3.37 m<br/> 3.46 m<br/> 2.31 dd (11.0, 11.0)<br/> 2.99 br d (11.0)<br/> 1.16 d (6.3)<br/> 3.44 dd (6.6, 6.3)<br/> ~1.7 m<br/> 1.62 br d (13.0)<br/> 1.29 ddd (13.0, 13.0, 13.0)</p>                                                                                                                               |
| <p>NAME: 19-Hydroxy-20-epitandoline<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (50) C. Kan et al., <i>Planta Med.</i>, 1981, 41, 195.<br/> NOTES:</p>               | <p>MM: 370<br/> MF: <math>\text{C}_{21}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 110</p>  <p>2.77 ddd (12.5, 10, 5)<br/> 2.90 ddd (10, 6, -0.5)<br/> 1.77 ddd (12.5, 5, -0.5)<br/> 1.98 ddd (12.5, 12.5, 5)<br/> 7.24<br/> 6.88<br/> 7.14<br/> 6.80<br/> 8.88 br s<br/> 3.02 d (4)<br/> 3.48 d (12)<br/> 2.44 d (12)<br/> 4.17 br q (7)<br/> 1.27 d (7)<br/> 1.87 br d (15, 2.5)<br/> 1.72 dd (15, 6)<br/> 1.53 m (12, 6, 5, 4, 2.5)<br/> 2.25 dd (14, 12)<br/> 2.47 dd (14, 5)<br/> 3.75 s</p>                                                                               |

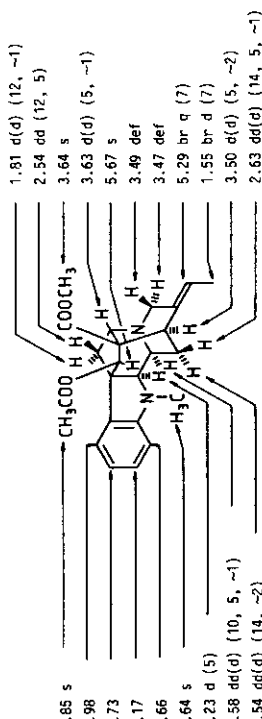
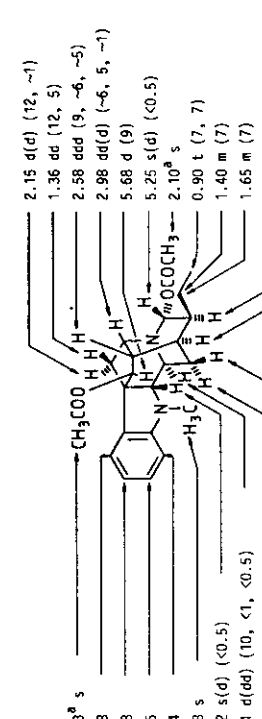
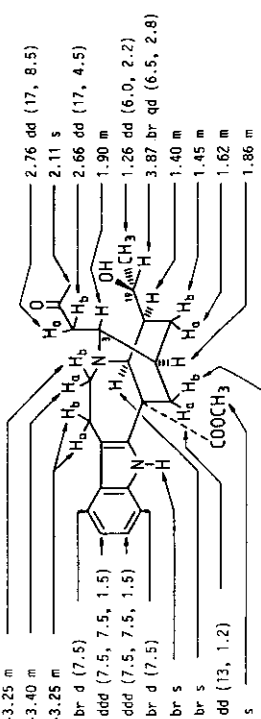
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| <p>NAME: 0-Acetylvallesamine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (42) P. Perera et al., <i>Planta Med.</i>, 1984, 50, 251.<br/> NOTES:</p>                                                                                               | <p>MM: 382<br/> MF: <math>\text{C}_{22}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 113</p>  <p>2.88 br dd (13.0, 6.8)<br/> 3.00 ddd (13.0, 13.0, 5.2)<br/> 2.03 br ddd (14.5, 11.5, 5.2)<br/> 2.33 ddd (14.5, 13.0, 6.8, 2.5)<br/> 7.48 br d (7.9, 1.2)<br/> 7.22 ddd (7.9, 7.9, 1.2)<br/> 7.10 ddd (7.9, 7.9, 1.2)<br/> 7.32 br d (7.9, 1.2)<br/> 8.69 br s<br/> 3.80 s<br/> 4.83 d (17.5)<br/> 4.18 d (17.5)<br/> 3.63 dq (15.5, 2.2)<br/> 3.78 br d (15.5)<br/> 5.61 br q (6.9)<br/> 1.77 dd (6.9, 2.2)<br/> 3.87 dd (11.5, 2.5)<br/> 2.09 s<br/> 4.32 d (11.0)<br/> 4.48 d (11.0)</p> |
| <p>NAME: 3-(8-Hydroxyethyl)-coronaridine<br/> FREQUENCY: 400 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (22) X.Z. Feng et al., <i>Planta Med.</i>, 1982, 44, 212.<br/> NOTES:</p>                                                                                   | <p>MM: 382<br/> MF: <math>\text{C}_{23}\text{H}_{30}\text{O}_3</math><br/> NO: 115</p>  <p>3.2<sup>a</sup> m<br/> 3.0<sup>d</sup> m<br/> 7.48<br/> 7.11<br/> 7.17<br/> 7.26<br/> 7.75 br s<br/> 3.70 na d (&lt;0.2)<br/> 1.92 br d (12, -3)<br/> 3.75 s<br/> 2.67 br d (12, -3)<br/> 3.35<sup>b</sup> m<br/> 3.45<sup>b</sup> m<br/> 2.75 br d (~3)<br/> 1.17 d<br/> 3.57 m<br/> 1.48 dq (7, -7)<br/> 0.91 t (7)<br/> 1.60 dq (~7)<br/> 1.36 br dd (~10, -7, -5, &lt;0.2)<br/> 1.32<sup>c</sup> m (~12, -5)<br/> 1.58<sup>c</sup> m (~12, -10)<br/> 1.73 m (~3, -3, -3)</p>                       |
| <p>NAME: Aricine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (56) R. Verpoorte et al., <i>Planta Med.</i>, 1983, 49, 283.<br/> NOTES:</p>                                                                                                        | <p>MM: 382<br/> MF: <math>\text{C}_{22}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 114</p>  <p>6.90 d (2.5)<br/> 3.84 s<br/> 6.77 dd (8.7, 2.5)<br/> 7.15 d (8.7)<br/> 7.75 s<br/> 3.32 dd (12, 2)<br/> 2.48 ddd (12, 4.5, 2)<br/> 1.52 q (12, 12)<br/> 2.75 dt (12, 4.5, 4.5)<br/> 2.64 br d (15)<br/> 2.93-2.83 m<br/> 2.53 dd (14.5, 11)<br/> 2.94 dd (14.5, 11 (21))<br/> 2.71 dd (12, 3.5)<br/> 3.09 dd (12, 2)<br/> 1.70 m<br/> 4.49 dq (12, 6.2)<br/> 1.40 d<br/> 7.56 s<br/> 3.74 s</p>                                                                                          |
| <p>NAME: 12-Methoxy-14,15-dehydroincarnine<br/> FREQUENCY: 100 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (57) T.A. van Beek et al., <i>Planta Med.</i>, 1983, 49, 83.<br/> NOTES: One of the chemical shifts given for C(9)H and C(10)H seems to be erroneous.</p> | <p>MM: 382<br/> MF: <math>\text{C}_{22}\text{H}_{26}\text{N}_2\text{O}_4</math><br/> NO: 116</p>  <p>7.08 dd (6.6, 2.0)<br/> 7.08 dd (6.6, 6.4)<br/> 6.58 dd (6.4, 2.0)<br/> 3.76 s<br/> 4.26 br s<br/> 3.85 s<br/> 2.48 d (12.5)<br/> 2.10 d (12.5)<br/> 2.4-4.0 m<br/> 4.04 br s<br/> 3.02 m<br/> 5.48 dt (9.4, 2.8)<br/> 5.78 br d (9.4)<br/> 0.99 t (7.6)<br/> 2.05 dd (12.5, 7.6)<br/> 1.59 dd (12.5, 7.6)</p>                                                                                                                                                                              |

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| NAME: Vandrikidine<br>FREQUENCY: 400 MHz SOLVENT: CDCl <sub>3</sub><br>REFERENCE: (53) M. Lounasmaa and S.-K. Kan, <i>Acta Chem. Scand., Ser. B</i> , 1980, <b>34</b> , 379.<br>NOTES: 19R. | NAME: Acetyldihydrovomilinenine<br>FREQUENCY: 400 MHz SOLVENT: CDCl <sub>3</sub><br>REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i> , 1985, <b>23</b> , 1503. NO: 119<br>NOTES: |
|                                                                                                                                                                                             |                                                                                                                                                                                          |

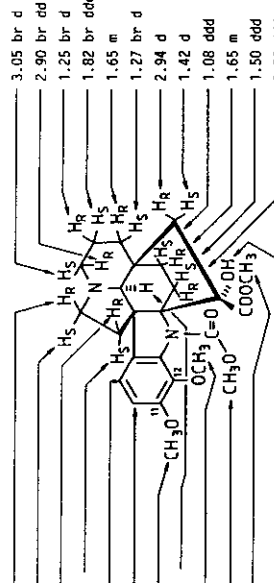
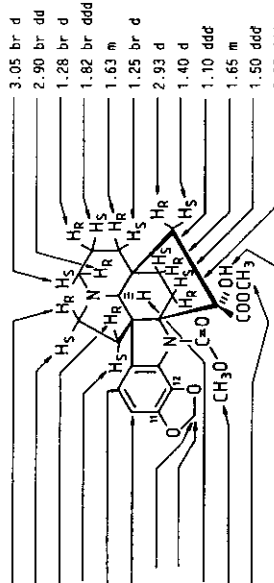
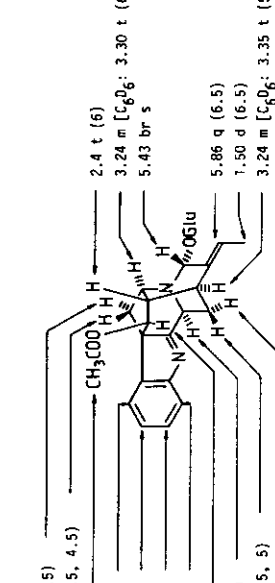
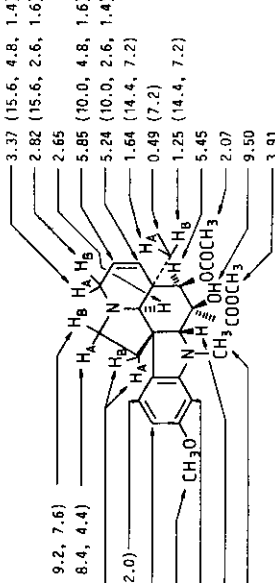
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| NAME: Vandrikine<br>FREQUENCY: 400 MHz SOLVENT: CDCl <sub>3</sub><br>REFERENCE: (53) M. Lounasmaa and S.-K. Kan, <i>Acta Chem. Scand., Ser. B</i> , 1980, <b>34</b> , 379.<br>NOTES: | NAME: Akumilinenine<br>FREQUENCY: 300 MHz<br>REFERENCE: (52) T.A. van Beek et al., <i>J. Nat. Prod.</i> , 1985, <b>48</b> , 400. NO: 120<br>NOTES: |
|                                                                                                                                                                                      |                                                                                                                                                    |

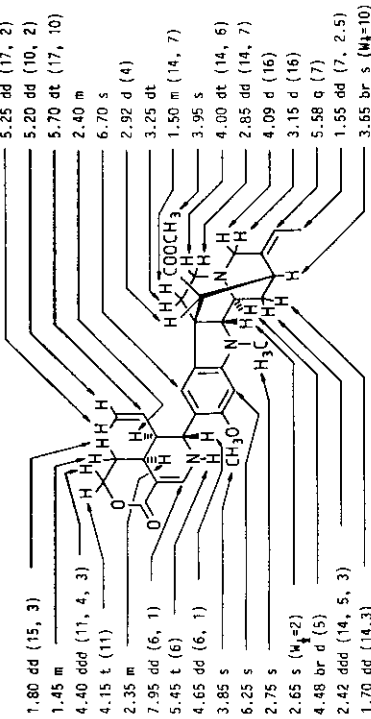
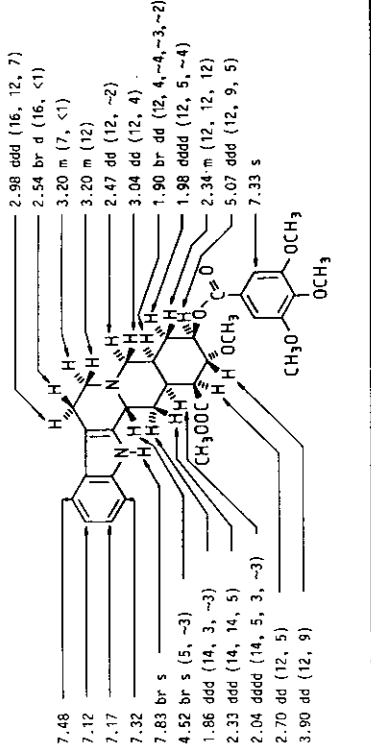
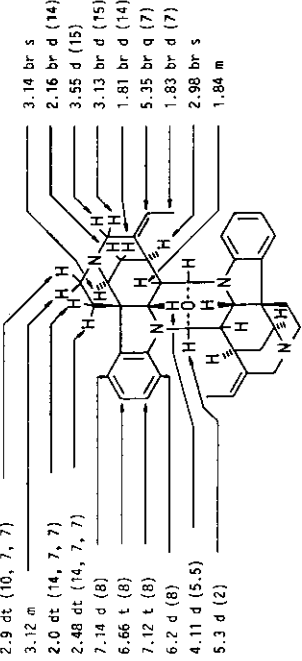
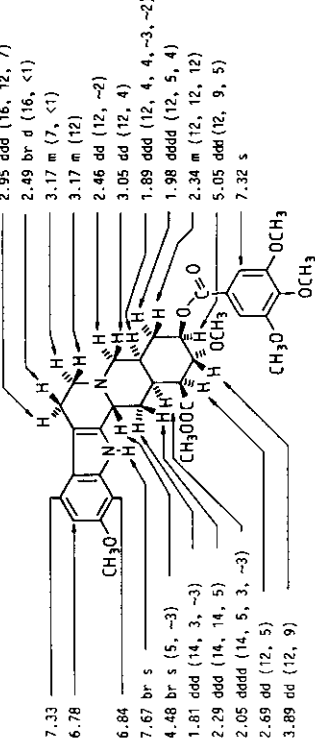
|                                                                                                                                                                                                                                        |                                                                                           |
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| <p>NAME: Brucine<br/>FREQUENCY: 360 MHz SOLVENT: CDCl<sub>3</sub><br/>REFERENCE: (58) M.A. Bernstein and L.O. Hatl, <i>Can. J. Chem.</i>, 1985, 63, 483.<br/>NOTES: The shift of the olefinic proton not given.</p>                    | <p>MM: 394<br/>MF: C<sub>23</sub>H<sub>26</sub>N<sub>2</sub>O<sub>4</sub><br/>NO: 121</p> |
| <p>NAME: Difforleminine<br/>FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>REFERENCE: (59) J. Garnier and J. Mahuteau, <i>Tetrahedron Lett.</i>, 1985, 26, 1513.<br/>NOTES: Superscripts o and * denote interchangeable systems.</p> | <p>MM: 396<br/>MF: C<sub>22</sub>H<sub>24</sub>N<sub>2</sub>O<sub>5</sub><br/>NO: 123</p> |
| <p>NAME: Dacetyl/sarpagine<br/>FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>REFERENCE: (16) M. Lounasmaa et al., <i>Planta Med.</i>, 1985, 519.<br/>NOTES:</p>                                                                     | <p>MM: 394<br/>MF: C<sub>23</sub>H<sub>26</sub>N<sub>2</sub>O<sub>4</sub><br/>NO: 122</p> |
| <p>NAME: 10-Hydroxygeissoschizol diacetate<br/>FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>REFERENCE: (22) X.Z. Feng et al., <i>Planta Med.</i>, 1982, 44, 212.<br/>NOTES:</p>                                                    | <p>MM: 396<br/>MF: C<sub>23</sub>H<sub>28</sub>N<sub>2</sub>O<sub>4</sub><br/>NO: 124</p> |

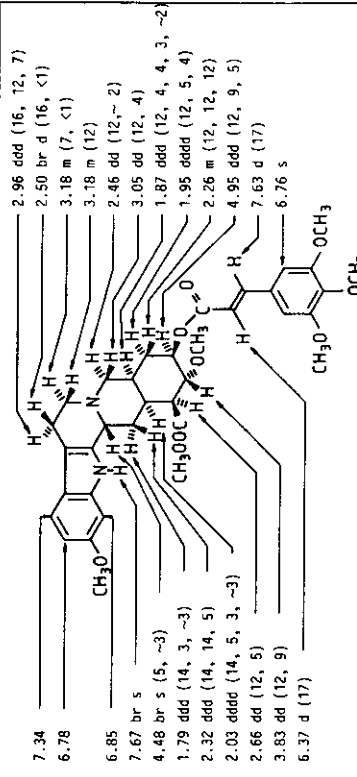
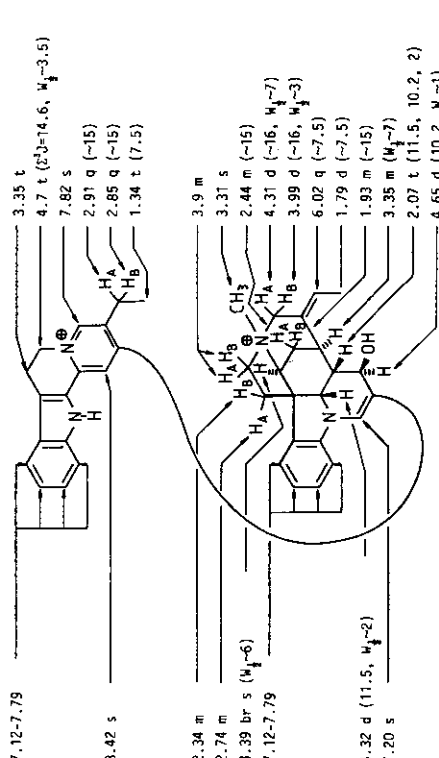
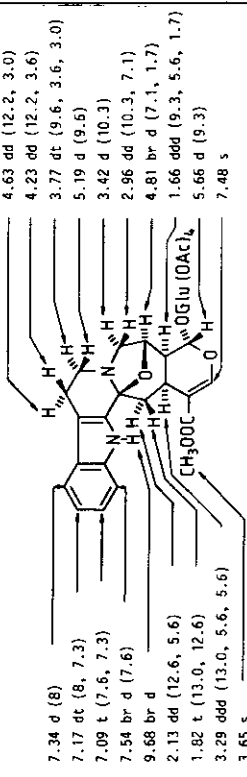
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| <p>NAME: Conopharyngine<br/> FREQUENCY: 300 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (52) T.A. van Beek et al., <i>J. Nat. Prod.</i>, 1985, 48, 400.<br/> NO: 125<br/> NOTES:</p>                                                                                                                                                                                                                                                         | <p>NAME: 19-Hydroxyvindikine<br/> FREQUENCY: 400 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (53) M. Lounasmaa and S.-K. Kan, <i>Acta Chem. Scand.</i>, Ser. B, 1980, 34, 379.<br/> NOTES:</p>                                                                                                                                                                                                                    | <p>NAME: Vincarodine<br/> FREQUENCY: 220 MHz<br/> SOLVENT: CDCl<sub>3</sub>/D<sub>2</sub>O<br/> REFERENCE: (61) N. Neuss et al., <i>Helv. Chim. Acta</i>, 1973, 56, 2860.<br/> NOTES:</p>                                                                                                                                                                                                                                            |
| <p>NAME: 398<br/> MF: C<sub>23</sub>H<sub>30</sub>N<sub>2</sub>O<sub>4</sub><br/> NO: 125</p>  <p>2.96 m (ΣJ=28)<br/> 3.40 m (ΣJ=28)<br/> 3.25-3.10 m<br/> 6.90<sup>s</sup> s<br/> 3.91<sup>s</sup> s<br/> 3.86<sup>s</sup> s<br/> 6.78<sup>s</sup> s<br/> 7.75 br s<br/> 3.55 br s<br/> 2.55 ddd (14.5, 2.9, 2.9)<br/> 3.71 s<br/> 1.90 ddd (14.5, 3.2, 2.8)</p> | <p>NAME: 398<br/> MF: C<sub>22</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub><br/> NO: 127</p>  <p>2.96 br d (12, 7, -1)<br/> 2.82 ddd (12, 10, 5)<br/> 2.00 ddd (14, 10, 7)<br/> 1.81 br dd (14, 5, -1)<br/> 7.15<br/> 6.42<br/> 3.76<sup>s</sup> s<br/> 6.40<br/> 8.92 br s<br/> 3.21 br s (-1)<br/> 3.77<sup>s</sup> s</p>            | <p>NAME: 398<br/> MF: C<sub>22</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub><br/> NO: 128</p>  <p>4.11 s<br/> 7.32 d (8.5)<br/> 6.80 dd (8.5, 2.0)<br/> 3.77 s<br/> 6.52 d (2.0)<br/> 4.05 s<br/> 2.72 (12.0)<br/> 2.37 (12.0)<br/> 1.76 m (15.2, 7.6)<br/> 2.07 m (15.2, 7.6)</p>                                                                |
| <p>NAME: 12-Hydroxy-11-methoxydiaboline<br/> FREQUENCY: 300 MHz<br/> SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (60) F.C. Ohiri et al., <i>Planta Med.</i>, 1984, 50, 446.<br/> NOTES:</p>                                                                                                                                                                                                                                                           | <p>NAME: 398<br/> MF: C<sub>22</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub><br/> NO: 126</p>  <p>2.80 ddd (12.2, 11.0, 7.5)<br/> 3.35 dd (11.0, 7.8)<br/> 1.91 dd (12.2, 7.5)<br/> 1.72 ddd (12.2, 12.2, 7.8)<br/> 1.57 br d (11.0)<br/> 6.72 d (8.0)<br/> 6.58 d (8.0)<br/> 3.87 s<br/> 10.2 br s<br/> 2.44 s<br/> 4.25 d (11.0)</p> | <p>NAME: 398<br/> MF: C<sub>22</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub><br/> NO: 128</p>  <p>2.85 m (16.8, 10.0, 7.5)<br/> 2.61 m (16.8, 8.0, 1.0)<br/> 3.12 m (14.5, 7.5, 1.0)<br/> 3.26 m (14.5, 10.0, 8.0)<br/> 2.26 dd (13.0, 2.2)<br/> 2.14 dd (13.0, 2.5)<br/> 2.45<br/> 3.72 q (2.8, 2.5, 2.2)<br/> 3.93 d (2.8)<br/> 1.05 t (7.6)</p> |

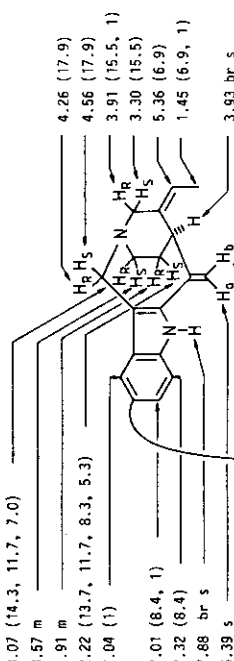
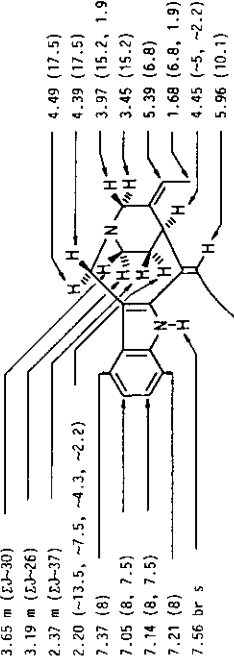
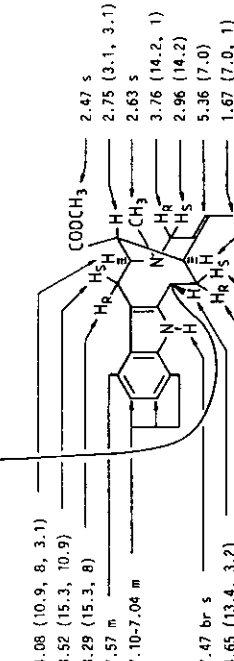
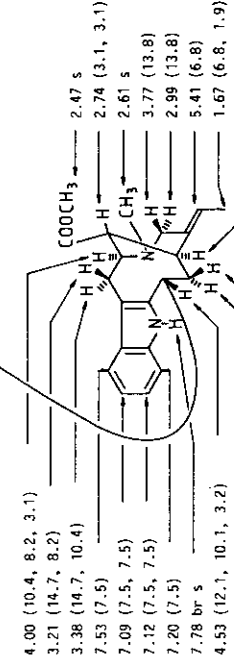
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p>NAME: Vincamine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503.<br/>NOTES: 17R.</p>                                                                                                                                                                                                                                                                                                                                     | <p>NAME: Diacetylsandwichine<br/>FREQUENCY: 400 MHz<br/>REFERENCE: (10) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 1503.<br/>NOTES: 17S.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>NAME: 3-Ketopropyl-19R-heyneanine<br/>FREQUENCY: 300 MHz<br/>REFERENCE: (62) P. Perera et al., <i>Phytochemistry</i>, 1985, 24, 2097.<br/>NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>MF: <math>C_{24}H_{28}N_2O_4</math><br/>NO: 129</p>  <p>1.85 s<br/>6.98<br/>6.73<br/>7.17<br/>6.66<br/>2.64 s<br/>3.23 d (5)<br/>3.58 dd(d) (10, 5, ~1)<br/>1.54 dd(d) (14, ~2)<br/>1.81 d(d) (12, ~1)<br/>2.54 dd (12, 5)<br/>3.64 s<br/>3.63 d(d) (5, ~1)<br/>5.67 s<br/>3.49 def<br/>3.47 def<br/>5.29 br q (7)<br/>1.55 br d (7)<br/>3.50 d(d) (5, ~2)<br/>2.63 dd(d) (14, 5, ~1)</p> | <p>MF: <math>C_{24}H_{30}N_2O_4</math><br/>NO: 131</p>  <p>2.03<sup>a</sup> s<br/>7.08<br/>6.78<br/>7.15<br/>6.64<br/>2.78 s<br/>3.02 s(d) (&lt;0.5)<br/>3.71 d(dd) (10, &lt;1, &lt;0.5)<br/>1.68 def (10, &lt;1)<br/>1.68 def (~4, &lt;1)<br/>2.15 d(d) (12, ~1)<br/>1.36 dd (12, 5)<br/>2.58 ddd (9, ~6, ~5)<br/>2.98 dd(d) (~6, 5, ~1)<br/>5.68 d (9)<br/>5.25 s(d) (&lt;0.5)<br/>2.10<sup>a</sup> s<br/>0.90 t (7, 7)<br/>1.40 m (7)<br/>1.65 m (7)<br/>1.38 m (~3, &lt;0.5)<br/>1.96 m (~5, ~4, ~3, &lt;1)</p> | <p>MF: <math>C_{24}H_{30}N_2O_4</math><br/>NO: 132</p>  <p>3.10-3.25 m<br/>3.29-3.40 m<br/>3.10-3.25 m<br/>7.43 br d (7.5)<br/>7.16 ddd (7.5, 7.5, 1.5)<br/>7.09 ddd (7.5, 7.5, 1.5)<br/>7.23 br d (7.5)<br/>7.81 br s<br/>4.11 br s<br/>2.63 dd (13, 1.2)<br/>3.71 s<br/>2.10 d (13)<br/>2.76 dd (17, 8.5)<br/>2.11 s<br/>2.66 dd (17, 4.5)<br/>1.90 m<br/>1.26 dd (6.0, 2.2)<br/>3.87 br qd (6.5, 2.8)<br/>1.40 m<br/>1.45 m<br/>1.62 m<br/>1.86 m</p> |

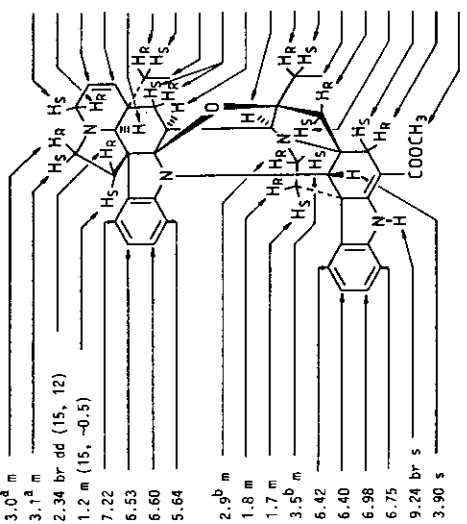
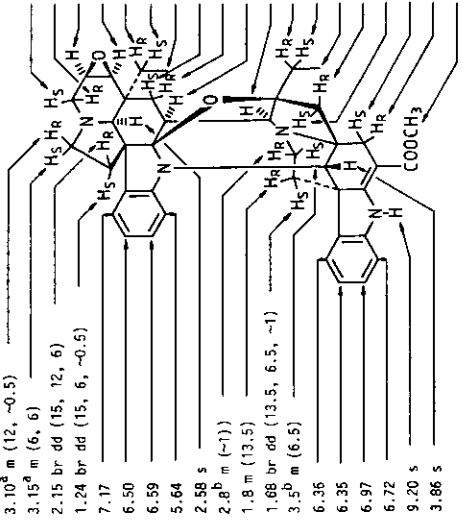
|                                                                                                                                                    |                                                                                                                                                                                                                          |                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NAME: Picraline<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (52) T.A. van Beek et al., <i>J. Nat. Prod.</i>, 1985, 48, 400. NO: 133<br/> NOTES:</p> | <p>NAME: Methyl reserpate<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371. NO: 135<br/> NOTES: Three CH<sub>3</sub>O-groups at 3.83 (s), 3.80 (s) and 3.58 (s).</p> | <p>NAME: (-)-N-Methoxycarbonyl-12-methoxykopsalinaline<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (64) X.Z. Feng et al., <i>Planta Med.</i>, 1983, 48, 280. NO: 136<br/> NOTES:</p> |
| <p>NAME: Picraline<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (52) T.A. van Beek et al., <i>J. Nat. Prod.</i>, 1985, 48, 400. NO: 133<br/> NOTES:</p> | <p>NAME: Methyl reserpate<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371. NO: 135<br/> NOTES: Three CH<sub>3</sub>O-groups at 3.83 (s), 3.80 (s) and 3.58 (s).</p> | <p>NAME: (-)-N-Methoxycarbonyl-12-methoxykopsalinaline<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (64) X.Z. Feng et al., <i>Planta Med.</i>, 1983, 48, 280. NO: 136<br/> NOTES:</p> |
| <p>NAME: Picraline<br/> FREQUENCY: 300 MHz<br/> REFERENCE: (52) T.A. van Beek et al., <i>J. Nat. Prod.</i>, 1985, 48, 400. NO: 133<br/> NOTES:</p> | <p>NAME: Methyl reserpate<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371. NO: 135<br/> NOTES: Three CH<sub>3</sub>O-groups at 3.83 (s), 3.80 (s) and 3.58 (s).</p> | <p>NAME: (-)-N-Methoxycarbonyl-12-methoxykopsalinaline<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (64) X.Z. Feng et al., <i>Planta Med.</i>, 1983, 48, 280. NO: 136<br/> NOTES:</p> |

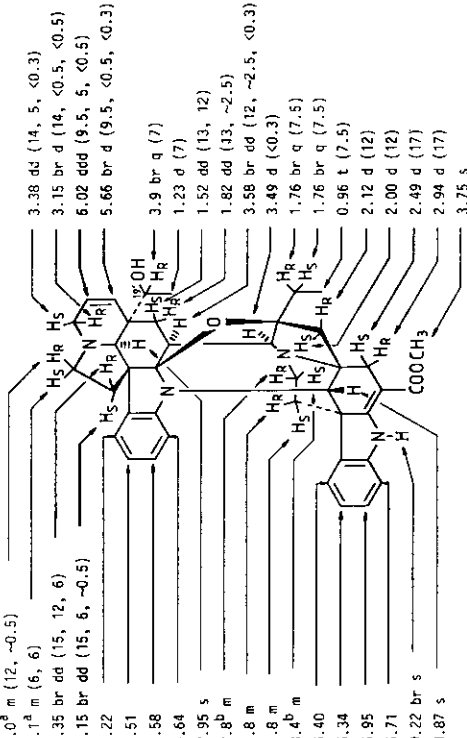
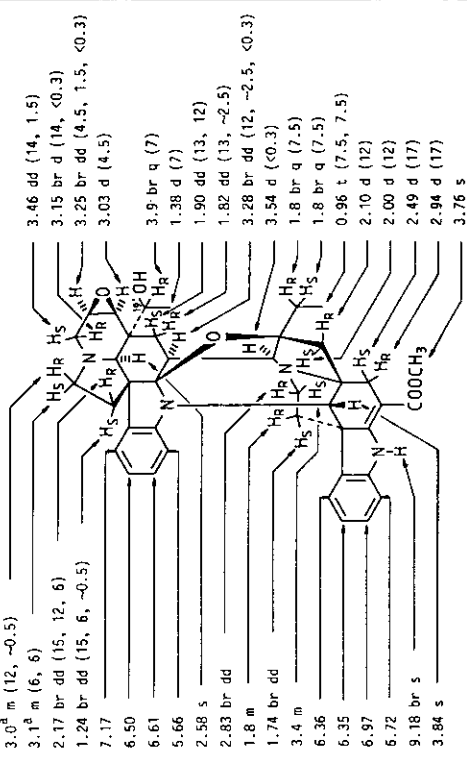
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NAME: (-)-N-Methoxycarbonyl-11,12-dimethoxykopsinaline</p> <p>FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub></p> <p>REFERENCE: (64) X. Z. Feng et al., <i>Planta Med.</i>, 1983, 49, 280.</p> <p>NOTES:</p>                                                                                                                                                                                                                                                                                                                                          | <p>MW: 472</p> <p>MF: C<sub>25</sub>H<sub>32</sub>N<sub>2</sub>O<sub>7</sub></p> <p>NO: 139</p>                                                                                                              |
|  <p>3.08 dd<br/>2.95 m<br/>1.75 m<br/>2.18 ddd<br/>6.91 d<br/>6.58 d<br/>3.87<sup>a</sup> s<br/>2.82 br s<br/>3.93<sup>a</sup> s<br/>3.76<sup>b</sup> s<br/>3.79<sup>b</sup> s<br/>6.68 s</p> <p>3.05 br d<br/>2.90 br dd<br/>1.25 br d<br/>1.82 br ddd<br/>1.65 m<br/>1.27 br d<br/>2.94 d<br/>1.42 d<br/>1.08 ddd<br/>1.65 m<br/>1.50 ddd<br/>2.39 ddd</p>                                                                                                         | <p>NAME: (-)-N-Methoxycarbonyl-11,12-dimethoxykopsinaline</p> <p>FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub></p> <p>REFERENCE: (64) X. Z. Feng et al., <i>Planta Med.</i>, 1983, 49, 280.</p> <p>NOTES:</p> |
|  <p>3.10 dd<br/>2.95 m<br/>1.72 m<br/>2.07 ddd<br/>6.74 d<br/>6.50 d<br/>5.86 def d<br/>5.89 def d<br/>2.86 br s<br/>3.76<sup>a</sup> s<br/>3.85<sup>a</sup> s<br/>6.98 s</p> <p>3.05 br d<br/>2.90 br dd<br/>1.28 br d<br/>1.82 br ddd<br/>1.63 m<br/>1.25 br d<br/>2.93 d<br/>1.40 d<br/>1.10 ddd<br/>1.65 m<br/>1.50 ddd<br/>2.35 ddd</p>                                                                                                                       | <p>MW: 456</p> <p>MF: C<sub>25</sub>H<sub>32</sub>N<sub>2</sub>O<sub>7</sub></p> <p>NO: 137</p>                                                                                                              |
| <p>NAME: Raucaffricine</p> <p>FREQUENCY: 300/400 MHz SOLVENT: C<sub>6</sub>D<sub>6</sub>N</p> <p>REFERENCE: (66) H. Schibel et al., <i>Helv. Chim. Acta.</i>, 1984, 67, 2078.</p> <p>NOTES: Signals of the glucose units: 5.29 (d, 8), 4.52 (dd, 12, 2), 4.33 (dd, 12, 5), 4.2-4.35 (2H, m), 4.1 (t, 8.0) and 3.94 (m).</p>                                                                                                                                                                                                                           | <p>MW: 512</p> <p>MF: C<sub>27</sub>H<sub>32</sub>N<sub>2</sub>O<sub>8</sub></p> <p>NO: 140</p>                                                                                                              |
|  <p>1.69 dd (11.5)<br/>2.74 dd (11.5, 4.5)<br/>2.16 s<br/>7.81<sup>a</sup> d (8)<br/>7.42<sup>b</sup> t (8)<br/>7.28<sup>b</sup> t (8)<br/>7.66<sup>a</sup> d (8)<br/>5.23 s<br/>5.14 d (9.5)<br/>1.84 dd (13.5, 5)<br/>2.16 [addn of C<sub>6</sub>D<sub>6</sub>: 2.26 dd (13.5, 9.5)]</p> <p>2.4 t (5)<br/>3.24 m [C<sub>6</sub>D<sub>6</sub>: 3.30 t (6)]<br/>5.43 br s<br/>5.86 q (6.5)<br/>1.50 d (6.5)<br/>3.24 m [C<sub>6</sub>D<sub>6</sub>: 3.35 t (5)]</p> | <p>NAME: Vindoline</p> <p>FREQUENCY: 360 MHz SOLVENT: CDCl<sub>3</sub></p> <p>REFERENCE: (65) A. De Bruyn et al., <i>Bull. Soc. Chim. Belg.</i>, 1981, 90, 185.</p> <p>NOTES:</p>                            |
|  <p>2.53 (10.0, 9.2, 7.6)<br/>3.54 (10.0, 8.4, 4.4)<br/>2.35<br/>6.90 (8.0, 2.0)<br/>6.30 (8.0)<br/>3.89<br/>6.08 (2.0)<br/>3.85<br/>2.65</p> <p>3.37 (15.6, 4.8, 1.4)<br/>2.82 (15.6, 2.6, 1.6)<br/>2.65<br/>5.85 (10.0, 4.8, 1.6)<br/>5.24 (10.0, 2.6, 1.4)<br/>1.64 (14.4, 7.2)<br/>0.49 (7.2)<br/>1.25 (14.4, 7.2)<br/>5.45<br/>2.07<br/>9.50<br/>3.91</p>                                                                                                    | <p>MW: 456</p> <p>MF: C<sub>25</sub>H<sub>32</sub>N<sub>2</sub>O<sub>6</sub></p> <p>NO: 138</p>                                                                                                              |

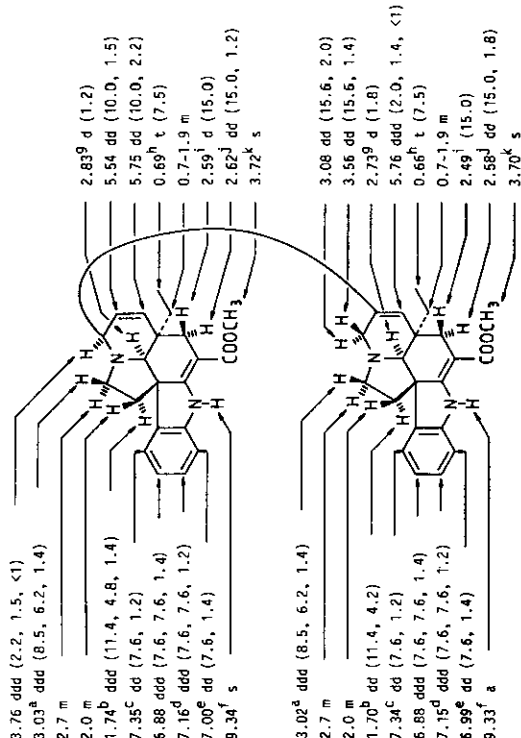
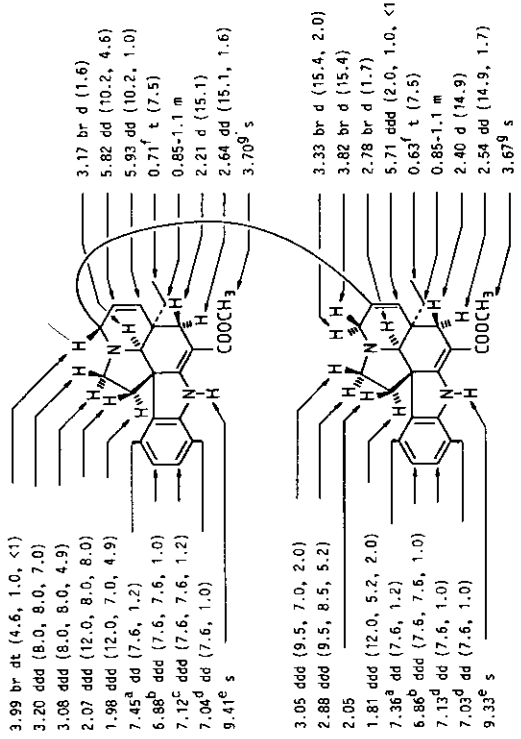
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <p>NAME: Gentiacraline<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (67) G. Massiot et al., <i>C.R. Acad. Sci., Sér. II</i>, 1983, 286, 977.<br/> NOTES: See also Ref. 84.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>NAME: Deserpine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371.<br/> NOTES: Five CH<sub>3</sub>O-groups at 3.89 (9H, s), 3.80 (3H, s) and 3.49 (3H, s).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>MM: 545<br/> MF: C<sub>32</sub>H<sub>39</sub>N<sub>3</sub>O<sub>5</sub><br/> NO: 141</p>  <p>1.80 dd (15, 3)<br/> 1.45 m<br/> 4.40 ddd (11, 4, 3)<br/> 4.15 t (11)<br/> 2.35 m<br/> 7.95 dd (6, 1)<br/> 5.45 t (6)<br/> 4.65 dd (6, 1)<br/> 3.85 s<br/> 5.25 s<br/> 2.75 s<br/> 2.65 s (4, 2)<br/> 4.48 br d (5)<br/> 2.42 ddd (14, 5, 3)<br/> 1.70 dd (14, 3)<br/> 5.25 dd (17, 2)<br/> 5.20 dd (10, 2)<br/> 5.70 dt (17, 10)<br/> 2.40 m<br/> 6.70 s<br/> 2.92 d (4)<br/> 3.25 dt<br/> 1.50 m (14, 7)<br/> 3.95 s<br/> 4.00 dt (14, 6)<br/> 2.85 dd (14, 7)<br/> 4.09 d (16)<br/> 3.15 d (16)<br/> 5.58 q (7)<br/> 1.55 dd (7, 2, 5)<br/> 3.65 br s (H<sub>3</sub>=10)</p> | <p>MM: 578<br/> MF: C<sub>32</sub>H<sub>38</sub>N<sub>2</sub>O<sub>8</sub><br/> NO: 143</p>  <p>7.48<br/> 7.12<br/> 7.17<br/> 7.32<br/> 7.83 br s<br/> 4.52 br s (5, -3)<br/> 1.86 ddd (14, 3, -3)<br/> 2.33 ddd (14, 14, 5)<br/> 2.04 dddd (14, 5, 3, -3)<br/> 2.70 dd (12, 5)<br/> 3.90 dd (12, 9)<br/> 2.98 ddd (16, 12, 7)<br/> 2.54 br d (16, &lt;1)<br/> 3.20 m (7, &lt;1)<br/> 3.20 m (12)<br/> 2.47 dd (12, -2)<br/> 3.04 dd (12, 4)<br/> 1.90 br dd (12, 4, -4, -3, -2)<br/> 1.98 dddd (12, 5, -4)<br/> 2.34 m (12, 12, 12)<br/> 5.07 ddd (12, 9, 5)<br/> 7.33 s</p> |
| <p>NAME: Matopentine<br/> FREQUENCY: 401 MHz<br/> REFERENCE: (68) G. Massiot et al., <i>Heterocycles</i>, 1983, 20, 2339.<br/> NOTES: See also Ref. 85.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>NAME: Reserpine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371.<br/> NOTES: Six CH<sub>3</sub>O-groups at 3.90 (9H, s), 3.81 (3H, s), 3.80 (3H, s) and 3.49 (3H, s).</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>MM: 570<br/> MF: C<sub>38</sub>H<sub>42</sub>N<sub>4</sub>O<br/> NO: 142</p>  <p>2.9 dt (10, 7, 7)<br/> 3.12 m<br/> 2.0 dt (14, 7, 7)<br/> 2.48 dt (14, 7, 7)<br/> 7.14 d (8)<br/> 6.66 t (8)<br/> 7.12 t (8)<br/> 6.2 d (8)<br/> 4.11 d (5, 5)<br/> 5.3 d (2)<br/> 3.14 br s<br/> 2.16 br d (14)<br/> 3.55 d (15)<br/> 3.13 br d (15)<br/> 1.81 br d (14)<br/> 5.35 br q (7)<br/> 1.83 br d (7)<br/> 2.98 br s<br/> 1.84 m</p>                                                                                                                                                                                                                                             | <p>MM: 608<br/> MF: C<sub>33</sub>H<sub>40</sub>N<sub>2</sub>O<sub>9</sub><br/> NO: 144</p>  <p>7.33<br/> 6.78<br/> 6.84<br/> 7.67 br s<br/> 4.48 br s (5, -3)<br/> 1.81 ddd (14, 3, -3)<br/> 2.29 ddd (14, 14, 5)<br/> 2.05 dddd (14, 5, 3, -3)<br/> 2.69 dd (12, 5)<br/> 3.89 dd (12, 9)<br/> 2.95 ddd (16, 12, 7)<br/> 2.49 br d (16, &lt;1)<br/> 3.17 m (7, &lt;1)<br/> 3.17 m (12)<br/> 2.46 dd (12, -2)<br/> 3.05 dd (12, 4)<br/> 1.89 ddd (12, 4, 4, -3, -2)<br/> 1.98 dddd (12, 5, 4)<br/> 2.34 m (12, 12, 12)<br/> 5.05 ddd (12, 9, 5)<br/> 7.32 s</p>              |

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| <p>NAME: Rescinamine<br/> FREQUENCY: 400 MHz<br/> REFERENCE: (63) M. Lounasmaa et al., <i>Heterocycles</i>, 1985, 23, 371.<br/> NOTES: Six CH<sub>3</sub>O-groups at 3.97 (6H, s), 3.89 (3H, s), 3.84 (3H, s), 3.82 (3H, s) and 3.53 (3H, s).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>NAME: Afrocuparine<br/> FREQUENCY: 360 MHz<br/> REFERENCE: (70) M. Caprasse et al., <i>Planta Med.</i>, 1984, 50, 131.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>MM: 634<br/> MF: C<sub>35</sub>H<sub>42</sub>N<sub>2</sub>O<sub>9</sub><br/> NO: 145</p>  <p>7.34<br/> 6.78<br/> 6.85<br/> 7.67 br s<br/> 4.48 br s (5, ~3)<br/> 1.79 ddd (14, 3, ~3)<br/> 2.32 ddd (14, 14, 5)<br/> 2.03 ddd (14, 5, 3, ~3)<br/> 2.66 dd (12, 5)<br/> 3.83 dd (12, 9)<br/> 5.37 d (17)<br/> 2.96 ddd (16, 12, 7)<br/> 2.50 br d (16, &lt;1)<br/> 3.18 m (7, &lt;1)<br/> 3.18 m (12)<br/> 2.46 dd (12, ~2)<br/> 3.05 dd (12, 4)<br/> 1.87 ddd (12, 4, 4, 3, ~2)<br/> 1.95 ddd (12, 5, 4)<br/> 2.26 m (12, 12, 12)<br/> 4.95 ddd (12, 9, 5)<br/> 7.63 d (17)<br/> 6.76 s</p> | <p>MM: 582<br/> MF: C<sub>39</sub>H<sub>42</sub>N<sub>4</sub>O<br/> NO: 147</p>  <p>7.12-7.79<br/> 8.42 s<br/> 3.35 t<br/> 4.7 t (J=14.6, H<sub>2</sub>-3.5)<br/> 7.82 s<br/> 2.91 q (~15)<br/> 2.85 q (~15)<br/> 1.34 t (7.5)</p>                                                                                                                                                                                                                                                                                                |
| <p>NAME: Cadamine tetraacetate<br/> FREQUENCY: 270 MHz<br/> REFERENCE: (69) S.S. Handa et al., <i>J. Nat. Prod.</i>, 1983, 46, 325.<br/> NOTES: Signals of the glucose unit: 5.07-5.28 (4H, m), 3.21 (dt), 2.68-2.86 (2H, m), 2.08 (3H, s), 2.07 (3H, s), 2.03 (3H, s) and 2.01 (3H, s).</p>                                                                                                                                                                                                                                                                                                                                                                                     | <p>MM: 712<br/> MF: C<sub>35</sub>H<sub>40</sub>N<sub>2</sub>O<sub>14</sub><br/> NO: 146</p>  <p>7.34 d (8)<br/> 7.17 dt (8, 7.3)<br/> 7.09 t (7.6, 7.3)<br/> 7.54 br d (7.6)<br/> 9.68 br d<br/> 2.13 dd (12.6, 5.6)<br/> 1.82 t (13.0, 12.6)<br/> 3.29 ddd (13.0, 5.6, 5.6)<br/> 3.65 s<br/> 4.63 dd (12.2, 3.0)<br/> 4.23 dd (12.2, 3.6)<br/> 3.77 dt (9.6, 3.6, 3.0)<br/> 5.19 d (9.6)<br/> 3.42 d (10.3)<br/> 2.96 dd (10.3, 7.1)<br/> 4.81 br d (7.1, 1.7)<br/> 1.66 ddd (9.3, 5.6, 1.7)<br/> 5.66 d (9.3)<br/> 7.48 s</p> |

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| <p>NAME: Pseudovobiparine<br/> FREQUENCY: 300 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (7) T.A. van Beek et al., <i>Planta Med.</i>, 1985, 277.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                               | <p>NAME: Vobiparine<br/> FREQUENCY: 500 MHz SOLVENT: <math>\text{CDCl}_3</math><br/> REFERENCE: (7) T.A. van Beek et al., <i>Tetrahedron Lett.</i>, 1984, 25, 2057.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                       |
| <p>MW: 600<br/> MF: <math>\text{C}_{30}\text{H}_{44}\text{N}_4\text{O}_2</math><br/> NO: 148</p>  <p>3.07 (14.3, 11.7, 7.0)<br/> 3.57 m<br/> 1.91 m<br/> 2.22 (13.7, 11.7, 8.3, 5.3)<br/> 7.04 (1)<br/> 7.01 (8.4, 1)<br/> 7.32 (8.4)<br/> 7.88 br s<br/> 5.39 s<br/> 5.27 s<br/> 4.26 (17.9)<br/> 4.56 (17.9)<br/> 3.91 (15.5, 1)<br/> 3.30 (15.5)<br/> 5.36 (6.9)<br/> 1.45 (6.9, 1)<br/> 3.93 br s</p> | <p>MW: 600<br/> MF: <math>\text{C}_{30}\text{H}_{44}\text{N}_4\text{O}_2</math><br/> NO: 149</p>  <p>3.65 m (23-30)<br/> 3.19 m (23-26)<br/> 2.37 m (23-37)<br/> 2.20 (~13.5, ~7.5, ~4.3, ~2.2)<br/> 7.37 (8)<br/> 7.05 (8, 7.5)<br/> 7.14 (8, 7.5)<br/> 7.21 (8)<br/> 7.56 br s<br/> 4.49 (17.5)<br/> 4.39 (17.5)<br/> 3.97 (15.2, 1.9)<br/> 3.45 (15.2)<br/> 5.39 (6.8)<br/> 1.68 (6.8, 1.9)<br/> 4.45 (~5, ~2.2)<br/> 5.96 (10.1)</p> |
|  <p>4.08 (10.9, 8, 3.1)<br/> 3.52 (15.3, 10.9)<br/> 3.29 (15.3, 8)<br/> 7.57 m<br/> 7.10-7.04 m<br/> 7.47 br s<br/> 4.65 (13.4, 3.2)<br/> 2.66 (15.6, 13.4, 13.3)<br/> 1.96 (15.6, 6.6, 3.2)<br/> 2.47 s<br/> 2.75 (3.1, 3.1)<br/> 2.63 s<br/> 3.76 (14.2, 1)<br/> 2.96 (14.2)<br/> 5.36 (7.0)<br/> 1.67 (7.0, 1)<br/> 3.78 (13.3, 6.6, 3.1)</p>                                                          |  <p>4.00 (10.4, 8.2, 3.1)<br/> 3.21 (14.7, 8.2)<br/> 3.38 (14.7, 10.4)<br/> 7.53 (7.5)<br/> 7.09 (7.5, 7.5)<br/> 7.12 (7.5, 7.5)<br/> 7.20 (7.5)<br/> 7.78 br s<br/> 4.53 (12.1, 10.1, 3.2)<br/> 2.64 (15.1, 12.6, 12.1)<br/> 1.89 (15.1, 6.8, 3.2)<br/> 2.47 s<br/> 2.74 (3.1, 3.1)<br/> 2.61 s<br/> 3.77 (13.8)<br/> 2.99 (13.8)<br/> 5.41 (6.8)<br/> 1.67 (6.8, 1.9)<br/> 3.74 (12.6, 6.8, 3.1)</p>                                   |

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| <p>NAME: Ervatoline<br/>         FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (72) A. Henriques et al., Acta Chem. Scand., Ser. B, 1980, 34, 509.<br/>         NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>NAME: Ervatoline<br/>         FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (73) A. Henriques et al., Acta Chem. Scand., Ser. B, 1979, 33, 775.<br/>         NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|  <p> <sup>1</sup>H NMR assignments (ppm):<br/>           3.0<sup>b</sup> m<br/>           3.1<sup>a</sup> m<br/>           2.34 br dd (15, 12)<br/>           1.2 m (15, -0.5)<br/>           7.22<br/>           6.53<br/>           6.60<br/>           5.64<br/>           2.9<sup>b</sup> m<br/>           1.8 m<br/>           1.7 m<br/>           3.5<sup>b</sup> m<br/>           6.42<br/>           6.40<br/>           6.98<br/>           6.75<br/>           9.24 br s<br/>           3.90 s<br/>           3.38 dd (14, 5, &lt;0.3)<br/>           3.18 br d (14, &lt;0.5, &lt;0.3)<br/>           5.92 ddd (9.5, 5, &lt;0.5)<br/>           5.75 br d (9.5, &lt;0.5, &lt;0.3)<br/>           2.75 s<br/>           1.5<sup>c</sup> m (7)<br/>           1.6<sup>c</sup> m (7)<br/>           0.90 t (7)<br/>           n.d.<br/>           3.12 br d (12)<br/>           3.50 d (&lt;0.3)<br/>           1.8 br q (7.5)<br/>           1.8 br q (7.5)<br/>           0.96 t (7.5)<br/>           2.15 d (12)<br/>           2.01 d (12)<br/>           2.50 d (17.5)<br/>           2.95 d (17.5)<br/>           3.78 s         </p> |  <p> <sup>1</sup>H NMR assignments (ppm):<br/>           3.10<sup>b</sup> m (12, -0.5)<br/>           3.15<sup>a</sup> m (6, 6)<br/>           2.15 br dd (15, 12, 6)<br/>           1.24 br dd (15, 6, -0.5)<br/>           7.17<br/>           6.50<br/>           6.59<br/>           5.64<br/>           2.58 s<br/>           2.8<sup>b</sup> m (~1)<br/>           1.8 m (13.5)<br/>           1.68 br dd (13.5, 6.5, -1)<br/>           3.5<sup>b</sup> m (6.5)<br/>           6.36<br/>           6.35<br/>           6.97<br/>           6.72<br/>           9.20 s<br/>           3.86 s<br/>           3.47 dd (14, 1.5)<br/>           3.10 br d (14, &lt;0.3)<br/>           3.25 br dd (4.5, 1.5, &lt;0.3)<br/>           3.03 d (4.5)<br/>           1.51<sup>c</sup> dq (14, 7)<br/>           1.63<sup>c</sup> dq (14, 7)<br/>           0.97 t (7, 7)<br/>           1.35 dd (13, -2.5)<br/>           1.92 dd (13, 12)<br/>           3.10 br d (12, -2.5, &lt;0.3)<br/>           3.54 d (&lt;0.3)<br/>           1.78<sup>d</sup> br q (7.5)<br/>           1.80<sup>d</sup> br q (7.5)<br/>           0.96 t (7.5, 7.5)<br/>           2.11 d (12)<br/>           2.00 d (12)<br/>           2.49 d (17.5)<br/>           2.94 d (17.5)<br/>           3.75 s         </p> |

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| <p>NAME: 19'-Hydroxyervafoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (72) A. Henriques et al., Acta Chem. Scand., Ser. B, 1980, 34, 509.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>NAME: 19'-Hydroxyervafoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (72) A. Henriques et al., Acta Chem. Scand., Ser. B, 1980, 34, 509.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>NAME: 19'-Hydroxyervafoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (72) A. Henriques et al., Acta Chem. Scand., Ser. B, 1980, 34, 509.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>NAME: 19'-Hydroxyervafoline<br/> FREQUENCY: 400 MHz SOLVENT: CDCl<sub>3</sub><br/> REFERENCE: (72) A. Henriques et al., Acta Chem. Scand., Ser. B, 1980, 34, 509.<br/> NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  <p>3.0<sup>a</sup> m (12, &lt;0.5)<br/> 3.1<sup>a</sup> m (6, 6)<br/> 2.35 br dd (15, 12, 6)<br/> 1.15 br dd (15, 6, &lt;0.5)<br/> 7.22<br/> 6.51<br/> 6.58<br/> 5.84<br/> 2.95 s<br/> 2.8<sup>b</sup> m<br/> 1.8 m<br/> 1.8 m<br/> 3.4<sup>b</sup> m<br/> 6.40<br/> 6.34<br/> 6.95<br/> 6.71<br/> 9.22 br s<br/> 3.87 s<br/> 3.38 dd (14, 5, &lt;0.3)<br/> 3.15 br d (14, &lt;0.5)<br/> 5.02 ddd (9.5, 5, &lt;0.5)<br/> 5.66 br d (9.5, &lt;0.5, &lt;0.3)<br/> 3.9 br q (7)<br/> 1.23 d (7)<br/> 1.52 dd (13, 12)<br/> 1.82 dd (13, ~2.5)<br/> 3.58 br dd (12, ~2.5, &lt;0.3)<br/> 3.49 d (&lt;0.3)<br/> 1.76 br q (7.5)<br/> 1.76 br q (7.5)<br/> 0.96 t (7.5)<br/> 2.12 d (12)<br/> 2.00 d (12)<br/> 2.49 d (17)<br/> 2.94 d (17)<br/> 3.75 s</p> |  <p>3.0<sup>a</sup> m (12, &lt;0.5)<br/> 3.1<sup>a</sup> m (6, 6)<br/> 2.17 br dd (15, 12, 6)<br/> 1.24 br dd (15, 6, &lt;0.5)<br/> 7.17<br/> 6.50<br/> 6.61<br/> 5.66<br/> 2.58 s<br/> 2.83 br dd<br/> 1.8 m<br/> 1.74 br dd<br/> 3.4 m<br/> 6.36<br/> 6.35<br/> 6.97<br/> 6.72<br/> 9.18 br s<br/> 3.84 s<br/> 3.46 dd (14, 1.5)<br/> 3.15 br d (14, &lt;0.3)<br/> 3.25 br dd (4.5, 1.5, &lt;0.3)<br/> 3.03 d (4.5)<br/> 3.9 br q (7)<br/> 1.38 d (7)<br/> 1.90 dd (13, 12)<br/> 1.82 dd (13, ~2.5)<br/> 3.28 br dd (12, ~2.5, &lt;0.3)<br/> 3.54 d (&lt;0.3)<br/> 1.8 br q (7.5)<br/> 1.8 br q (7.5)<br/> 0.96 t (7.5, 7.5)<br/> 2.10 d (12)<br/> 2.00 d (12)<br/> 2.49 d (17)<br/> 2.94 d (17)<br/> 3.76 s</p> |

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| <p>NAME: Voafrine A<br/>         FREQUENCY: 300 MHz<br/>         SOLVENT: (CD<sub>3</sub>)<sub>2</sub>CO<br/>         REFERENCE: (74) J. Stockigt et al., Helv. Chim. Acta, 1983, 66, 2505.<br/>         NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>NAME: Voafrine B<br/>         FREQUENCY: 500 MHz<br/>         SOLVENT: (CD<sub>3</sub>)<sub>2</sub>CO<br/>         REFERENCE: (74) J. Stockigt et al., Helv. Chim. Acta, 1983, 66, 2505.<br/>         NOTES:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>MM: 670<br/>         MF: C<sub>22</sub>H<sub>16</sub>N<sub>2</sub>O<sub>4</sub><br/>         MO: 154</p>  <p>3.76 ddd (2.2, 1.5, &lt;1)<br/>         3.03<sup>a</sup> ddd (8.5, 6.2, 1.4)<br/>         2.7 m<br/>         2.0 m<br/>         1.74<sup>b</sup> ddd (11.4, 4.8, 1.4)<br/>         7.35<sup>c</sup> dd (7.6, 1.2)<br/>         6.88 ddd (7.6, 7.6, 1.4)<br/>         7.16<sup>d</sup> ddd (7.6, 7.6, 1.2)<br/>         7.00<sup>e</sup> dd (7.6, 1.4)<br/>         9.34<sup>f</sup> s<br/>         2.83<sup>g</sup> d (1.2)<br/>         5.54 dd (10.0, 1.5)<br/>         5.75 dd (10.0, 2.2)<br/>         0.69<sup>h</sup> t (7.5)<br/>         0.7-1.9 m<br/>         2.59<sup>i</sup> d (15.0)<br/>         2.65<sup>j</sup> dd (15.0, 1.2)<br/>         3.72<sup>k</sup> s</p> | <p>MM: 670<br/>         MF: C<sub>22</sub>H<sub>16</sub>N<sub>2</sub>O<sub>4</sub><br/>         MO: 155</p>  <p>3.99 br dt (4.6, 1.0, &lt;1)<br/>         3.20 ddd (8.0, 8.0, 7.0)<br/>         3.08 ddd (8.0, 8.0, 4.9)<br/>         2.07 ddd (12.0, 8.0, 8.0)<br/>         1.98 ddd (12.0, 7.0, 4.9)<br/>         7.45<sup>a</sup> dd (7.6, 1.2)<br/>         6.88<sup>b</sup> ddd (7.6, 7.6, 1.0)<br/>         7.15<sup>c</sup> ddd (7.6, 7.6, 1.2)<br/>         7.04<sup>d</sup> dd (7.6, 1.0)<br/>         9.41<sup>e</sup> s<br/>         3.05 ddd (9.5, 7.0, 2.0)<br/>         2.88 ddd (9.5, 8.5, 5.2)<br/>         2.05<br/>         1.81 ddd (12.0, 5.2, 2.0)<br/>         7.36<sup>a</sup> dd (7.6, 1.2)<br/>         6.86<sup>b</sup> ddd (7.6, 7.6, 1.0)<br/>         7.15<sup>d</sup> dd (7.6, 1.0)<br/>         7.03<sup>d</sup> dd (7.6, 1.0)<br/>         9.33<sup>e</sup> s<br/>         3.33 br d (15.4, 2.0)<br/>         3.82 br d (15.4)<br/>         2.78 br d (1.7)<br/>         5.71 ddd (2.0, 1.0, &lt;1)<br/>         0.63<sup>f</sup> t (7.5)<br/>         0.85-1.1 m<br/>         2.40 d (14.9)<br/>         2.54 dd (14.9, 1.7)<br/>         3.67<sup>g</sup> s</p> |

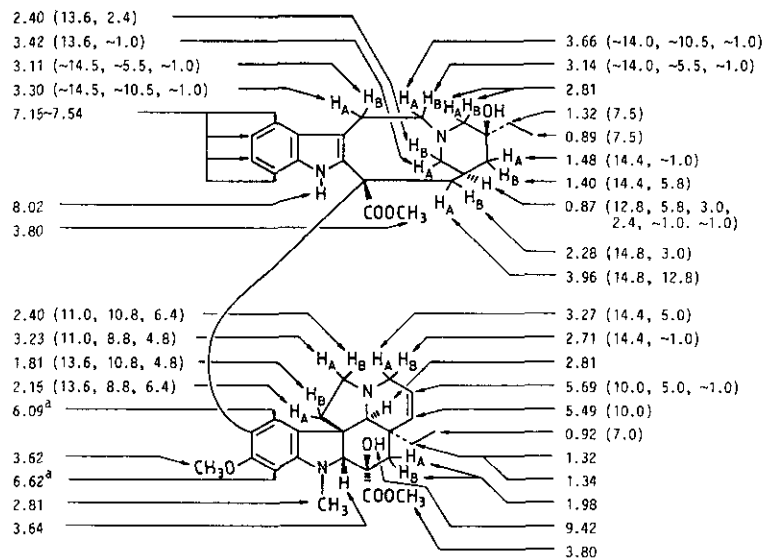
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| NAME: Ervahanine A<br>FREQUENCY: 400 MHz<br>REFERENCE: (49) X.-Z. Feng et al., J. Nat. Prod., 1981, 44, 670.<br>NOTES:                                                                                                                                                                                                                                                                                                                                                                                  | NAME: Ervahanine B<br>FREQUENCY: 400 MHz<br>REFERENCE: (49) X.-Z. Feng et al., J. Nat. Prod., 1981, 44, 670.<br>NOTES:                                                                                                                                                                                                                                                                                                                                                                                          |
| MM: 674<br>MF: $C_{42}H_{50}N_4O_4$<br>NO: 156                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MM: 674<br>MF: $C_{42}H_{50}N_4O_4$<br>NO: 157                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>2.45 s<br/>7.57 br dd (-8)<br/>7.1 m<br/>7.48 s<br/>4.63 dd (12, -3)<br/>2.68 br d (14, 12, 12)<br/>1.96 ddd (14, -3, -3)<br/>3.24 dd (14, 10)<br/>3.48 dd (14, 5)<br/>2.73 dd (-2, -2)<br/>4.03 ddd (10, 5, -2)<br/>2.57 s<br/>3.73 br d (12, -1)<br/>2.90 d (12, &lt;0.2)<br/>5.30 br q (7)<br/>1.63 d (7)<br/>3.77 m (12, -3, -2)</p>                                                                                                                                                             | <p>2.45 s<br/>7.58 br dd (-8)<br/>7.1 m<br/>7.49 s<br/>4.62 dd (12, -3)<br/>2.71 br d (14, 12, 12)<br/>1.92 ddd (14, -3, -3)<br/>3.24 dd (14, 10)<br/>3.50 dd (14, 5)<br/>2.72 dd (-2, -2)<br/>4.02 ddd (10, 5, -2)<br/>2.58 s<br/>3.73 br d (12, -1)<br/>2.88 d (12, &lt;0.2)<br/>5.30 br q (7, -1, &lt;0.2)<br/>1.63 d (7)<br/>3.74 m (12, -3, -2)</p>                                                                                                                                                        |
| <p>2.98<sup>a</sup> m<br/>3.10<sup>a</sup> m<br/>7.39 d (8)<br/>6.98 d (8)<br/>7.00 s<br/>7.72 s<br/>3.50 s(d) (&lt;0.2)<br/>1.81<sup>b</sup> br d (12, -3)<br/>3.66 s<br/>2.51<sup>b</sup> br d (12, -3)<br/>3.35<sup>c</sup> m<br/>3.15<sup>c</sup> m<br/>2.86<sup>d</sup> br d (9, -3)<br/>2.75<sup>d</sup> br d (9, -3)<br/>1.42 dq (7, -7)<br/>1.54 dq (7, -7)<br/>0.88 t (7, 7)<br/>1.30 m (-10, -7, -5, &lt;0.2)<br/>1.12 m (12.5, 5)<br/>1.68 br dd (12.5, -10)<br/>1.83 m (-3, -3, -3, -3)</p> | <p>2.95<sup>a</sup> m<br/>3.09<sup>a</sup> m<br/>7.31 s (2)<br/>6.98 d (8, 2)<br/>7.16 d (8)<br/>7.77 s<br/>3.48 s(d) (&lt;0.2)<br/>1.83<sup>b</sup> br d (12, -3)<br/>3.64 s<br/>2.53<sup>b</sup> br d (12, -3)<br/>3.33<sup>c</sup> m<br/>3.15<sup>c</sup> m<br/>2.86<sup>d</sup> br d (9, -3)<br/>2.78<sup>d</sup> br d (9, -3)<br/>1.42 dq (7, -7)<br/>1.54 dq (7, -7)<br/>0.88 t (7, 7)<br/>1.29 m (-10, -7, -5, &lt;0.2)<br/>1.12 m (12.5, -5)<br/>1.70 br dd (12.5, -10)<br/>1.84 m (-3, -3, -3, -3)</p> |

|                                                                                                                                                                                                                             |                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <p>NAME: Ervathanine C<br/>         FREQUENCY: 400 MHz<br/>         SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (49) X.-Z. Feng et al., <i>J. Nat. Prod.</i>, 1981, 44, 670.<br/>         NOTES:</p>                  | <p>MW: 674<br/>         MF: C<sub>22</sub>H<sub>28</sub>N<sub>4</sub>O<sub>4</sub><br/>         NO: 156</p> |
| <p>NAME: 17-Deacetoxyneurisine<br/>         FREQUENCY: 360 MHz<br/>         SOLVENT: CDCl<sub>3</sub><br/>         REFERENCE: (75) A. De Bruyn et al., <i>Bull. Soc. Chim. Belg.</i>, 1982, 91, 75.<br/>         NOTES:</p> | <p>MW: 750<br/>         MF: C<sub>24</sub>H<sub>34</sub>N<sub>4</sub>O<sub>7</sub><br/>         NO: 159</p> |

NAME: 17-Deacetoxyvinblastine  
 FREQUENCY: 360 MHz SOLVENT:  $\text{CDCl}_3$   
 REFERENCE: (75) A. De Bruyn *et al.*, *Bull. Soc. Chim. Belg.*,  
 1982, 91, 75.

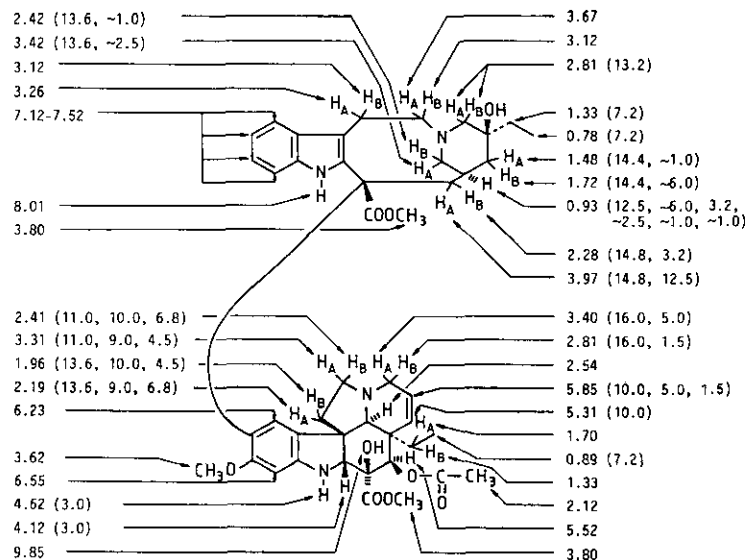
NOTES:

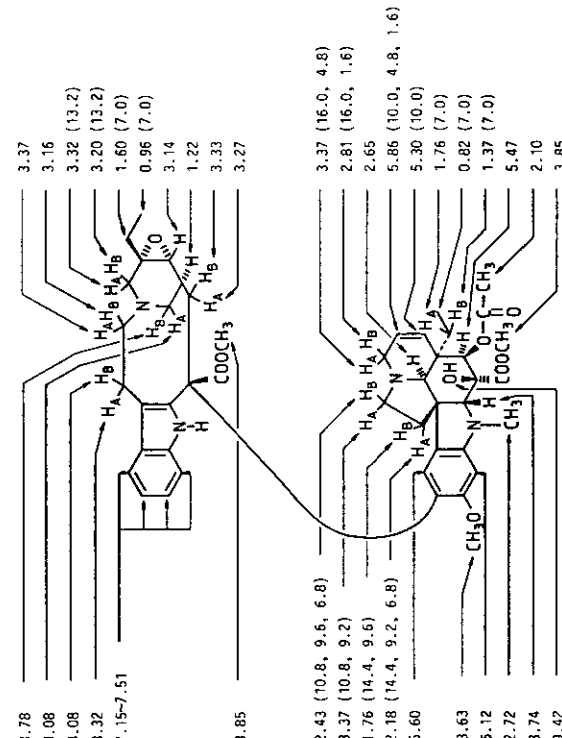
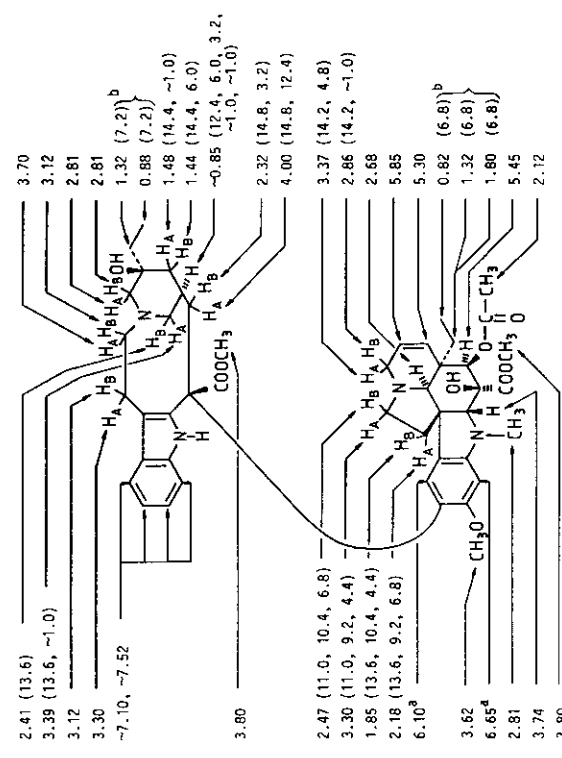
MW: 752  
 MF:  $\text{C}_{44}\text{H}_{56}\text{N}_4\text{O}_7$   
 NO: 160



NAME: N-Deformylvincristine  
 FREQUENCY: 360 MHz SOLVENT:  $\text{CDCl}_3$   
 REFERENCE: (76) R. Simonds *et al.*, *Planta Med.*, 1984, 50, 274.  
 NOTES:

MW: 796  
 MF:  $\text{C}_{46}\text{H}_{56}\text{N}_4\text{O}_9$   
 NO: 161



|                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NAME: Leurosine<br/>         FREQUENCY: 360 MHz<br/>         REFERENCE: (65) A. De Bruyn et al., Bull. Soc. Chim. Belg., 1981, 90, 185.</p> <p>MM: 808<br/>         MF: <math>C_{16}H_{16}N_4O_9</math><br/>         NO: 162</p> <p>NOTES:</p>                                      |  <p>13C NMR peaks (ppm): 3.78, 3.08, 3.08, 3.32, 7.15-7.51, 3.85, 2.43, 3.37, 1.76, 2.18, 6.60, 3.63, 6.12, 2.72, 3.74, 9.42, 3.37, 3.16, 3.32, 3.20, 1.60, 0.96, 3.14, 1.22, 3.33, 3.27, 3.37, 2.81, 2.65, 5.86, 5.30, 1.76, 0.82, 1.37, 5.47, 2.10, 3.85.</p> |
| <p>NAME: Vinblastine<br/>         FREQUENCY: 360 MHz<br/>         REFERENCE: (77) A. De Bruyn et al., Bull. Soc. Chim. Belg., 1980, 89, 629.</p> <p>MM: 810<br/>         MF: <math>C_{46}H_{56}N_4O_9</math><br/>         NO: 163</p> <p>NOTES: For NOE measurements, see Ref. 86.</p> |  <p>13C NMR peaks (ppm): 2.41, 3.39, 3.12, 3.30, -7.10, -7.52, 3.80, 2.47, 3.30, 1.85, 2.18, 6.10, 3.62, 6.65, 2.81, 3.74, 3.80, 3.70, 3.12, 2.81, 1.32, 0.88, 1.48, 1.44, -0.85, 2.32, 4.00, 3.37, 2.86, 2.68, 5.85, 5.30, 0.82, 1.32, 1.80, 5.45, 2.12.</p>     |

# INDEX OF ALKALOIDS

|                                                   | No  | Ref. |                                          | No  | Ref. |
|---------------------------------------------------|-----|------|------------------------------------------|-----|------|
| <u>A</u>                                          |     |      |                                          |     |      |
| 17-0-Acetyljajmaline                              | 106 | 10   | Diacetyljajmaline                        | 130 | 10   |
| Acetyldihydrovomilenine                           | 119 | 10   | Diacetylsandwichine                      | 131 | 10   |
| N <sub>8</sub> -Acetyl-0-methyl-strychnosplendine | 107 | 55   | Diacetylsarpagine                        | 122 | 16   |
| 0-Acetylvallesamine                               | 113 | 42   | Dichomine                                | 21  | 21   |
| Affinisine                                        | 31  | 16   | Difforlemenine                           | 123 | 59   |
| Afrocurarine                                      | 147 | 70   | 20R-18,19-Dihydroxypseudo-vincadiformine | 109 | 50   |
| Ajmalicine                                        | 71  | 47   | <u>E</u>                                 |     |      |
| Ajmaline                                          | 47  | 10   | (+)-Eburnamine                           | 22  | 15   |
| Akuammidine                                       | 72  | 16   | (-)-Eburnamonine                         | 11  | 15   |
| Akuammigine                                       | 73  | 47   | Ellipticine                              | 1   | 6    |
| Akuammline                                        | 120 | 52   | 16-Epiaffinine                           | 41  | 32   |
| Albifloranine                                     | 88  | 37   | 19-Epiajmalicine                         | 75  | 47   |
| 16,17-Anhydrotacamine                             | 51  | 18   | Epicathenamine                           | 67  | 44   |
| Apparicine                                        | 3   | 7    | 19R-Epiheyneanine                        | 89  | 42   |
| Aricine                                           | 114 | 56   | 20-Epi-ibophyllidine                     | 42  | 20   |
| Aristoserratenine                                 | 9   | 13   | 16-Epi-E-isositsirikine                  | 90  | 44   |
| Aristoserratine                                   | 32  | 27   | 16-Epi-Z-isositsirikine                  | 91  | 44   |
|                                                   |     |      | (+)-20-Epipandoline                      | 92  | 50   |
| <u>B</u>                                          |     |      | 16-Epitacamine                           | 93  | 18   |
| Brucine                                           | 121 | 58   | Ervafolene                               | 150 | 72   |
|                                                   |     |      | Ervafoline                               | 151 | 73   |
| <u>C</u>                                          |     |      | Ervahanine A                             | 156 | 49   |
| Cadambine tetraacetate                            | 146 | 69   | Ervahanine B                             | 157 | 49   |
| Cathenamine                                       | 66  | 44   | Ervahanine C                             | 158 | 49   |
| Conopharyngine                                    | 125 | 52   | <u>F</u>                                 |     |      |
| Coronaridine                                      | 54  | 37   | Fluorocurine                             | 46  | 29   |
| <u>D</u>                                          |     |      |                                          |     |      |
| 17-Deacetoxyeuroisine                             | 159 | 75   | <u>G</u>                                 |     |      |
| 17-Deacetoxyvinblastine                           | 160 | 75   | Geissoschizine                           | 76  | 48   |
| Deacetylakuammline                                | 74  | 31   | Geissoschizol                            | 23  | 22   |
| Deacetyldeformoakuammline                         | 39  | 31   | Gentiacraline                            | 141 | 67   |
| N-Deacetylisorretuline                            | 16  | 19   |                                          |     |      |
| N-Deacetylretuline                                | 17  | 19   | <u>H</u>                                 |     |      |
| 16R-Decarbomethoxytacamine                        | 18  | 18   | Hazuntinine                              | 134 | 53   |
| 16S-Decarbomethoxytacamine                        | 19  | 18   | Heyneanine                               | 94  | 37   |
| Deethylbophyllidine                               | 20  | 20   | Hobartine                                | 12  | 11   |
| N-Deformylvincristine                             | 161 | 76   | 3R-Hydroxycoronaridine                   | 95  | 51   |
| 1,2-Dehydrodeacetylretuline                       | 10  | 14   | 21-Hydroxycyclolochnerine                | 58  | 39   |
| Deserpidine                                       | 143 | 63   | 10-Hydroxydeacetylakuammline             | 108 | 31   |

|                                                | No  | Ref. |                                                       | No  | Ref |
|------------------------------------------------|-----|------|-------------------------------------------------------|-----|-----|
| 20S-Hydroxy-1,2-dehydropseudo-aspidospermidine | 24  | 18   | Mauisensine                                           | 33  | 10  |
| 23-Hydroxy-2,16-dehydreretuline                | 77  | 14   | Mavacurine                                            | 35  | 29  |
| 16S-Hydroxy-16,22-dihydroapparicine            | 4   | 8    | Melinonine-E                                          | 8   | 12  |
| 18-Hydroxy-20-epi-ibophyllidine                | 59  | 40   | (-)-N-Methoxycarbonyl-11,12-dimethoxykopsinaline      | 139 | 64  |
| 19R-Hydroxy-20-epi-ibophyllidine               | 60  | 40   | (-)-N-Methoxycarbonyl-12-methoxykopsinaline           | 136 | 64  |
| 19S-Hydroxy-20-epi-ibophyllidine               | 61  | 40   | (-)-N-Methoxycarbonyl-11,12-methylenedioxykopsinaline | 137 | 64  |
| 19-Hydroxy-20-epipandoline                     | 110 | 50   | 12-Methoxy-14,15-dehydrovincamine                     | 116 | 57  |
| 19'-Hydroxyervafolene                          | 152 | 72   | 11-Methoxytabersonine                                 | 102 | 53  |
| 19'-Hydroxyervafoline                          | 153 | 72   | N <sub>B</sub> -methylantirrhine                      | 38  | 24  |
| 3-(8-Hydroxyethyl)-coronaridine                | 115 | 22   | 17-O-Methylkribine                                    | 56  | 38  |
| 10-Hydroxygeissoschizol diacetate              | 124 | 22   | Methyl reserpate                                      | 135 | 63  |
| 14B-Hydroxygeissidine                          | 65  | 43   |                                                       |     |     |
| 10-Hydroxyheyneanine                           | 111 | 22   |                                                       |     |     |
| 19-Hydroxyibophyllidine                        | 62  | 40   | <u>N</u>                                              |     |     |
| 16-Hydroxyisoretulinal                         | 78  | 28   | Normacusine B                                         | 13  | 16  |
| 12-Hydroxy-11-methoxydiaboline                 | 126 | 60   |                                                       |     |     |
| 19S-Hydroxytacamine                            | 112 | 18   | <u>O</u>                                              |     |     |
| 17-Hydroxytacamonine                           | 36  | 18   | 3-Oxocoronaridine                                     | 82  | 22  |
| 19-Hydroxyvandrikine                           | 127 | 53   | 17-Oxoellipticine                                     | 2   | 6   |
| <u>I</u>                                       |     |      |                                                       |     |     |
| Ibophyllidine                                  | 43  | 20   | <u>P</u>                                              |     |     |
| 3-Isoajmalicine                                | 79  | 47   | (+)-Pandoline                                         | 98  | 50  |
| Isoajmaline                                    | 48  | 10   | Peduncularine                                         | 5   | 9   |
| (-)-Isoeburnamine                              | 25  | 15   | Peduncularistine                                      | 29  | 25  |
| 3-Iso-19-epiajmalicine                         | 80  | 47   | Pericyclivine                                         | 40  | 16  |
| Isomalindine                                   | 27  | 24   | Picraline                                             | 133 | 52  |
| 3-Isorauniticine                               | 81  | 47   | Polyneuridine                                         | 83  | 16  |
| Isoretuline                                    | 55  | 19   | Pseudovobparicine                                     | 148 | 7   |
| Isosandwichine                                 | 49  | 10   |                                                       |     |     |
| E-Isositsirikine                               | 96  | 44   | <u>Q</u>                                              |     |     |
| Z-Isositsirikine                               | 97  | 44   | Quebrachidine                                         | 84  | 10  |
| Isovallesiachotamine                           | 68  | 45   |                                                       |     |     |
| <u>K</u>                                       |     |      | <u>R</u>                                              |     |     |
| 3-Ketopropyl-19R-heyneanine                    | 132 | 62   | Raucaffricine                                         | 140 | 66  |
|                                                |     |      | Raucubaine                                            | 63  | 41  |
| <u>L</u>                                       |     |      | Raucubainine                                          | 99  | 41  |
| Leurosine                                      | 162 | 65   | Rauflorine                                            | 6   | 10  |
|                                                |     |      | Rauniticine                                           | 85  | 47  |
| <u>M</u>                                       |     |      | Rescinnamine                                          | 145 | 63  |
| Malindine                                      | 28  | 24   | Reserpine                                             | 144 | 63  |
| Matopensine                                    | 142 | 68   | Retuline                                              | 57  | 19  |
|                                                |     |      | Rosibiline                                            | 34  | 28  |
|                                                |     |      | Rosicine                                              | 44  | 33  |

|                     | No  | Ref. |                   | No  | Ref. |
|---------------------|-----|------|-------------------|-----|------|
| <u>S</u>            |     |      | <u>V</u>          |     |      |
| Sorelline           | 7   | 11   | Vallesiachotamine | 70  | 45   |
| Strempelepine       | 14  | 17   | Vallesamine       | 64  | 42   |
| Strychnine          | 50  | 34   | Vandrikidine      | 117 | 53   |
| Strychnozairine     | 69  | 46   | Vandrikine        | 118 | 53   |
| Strychnoxanthine    | 30  | 26   | Vinblastine       | 163 | 77   |
|                     |     |      | Vincamajine       | 104 | 10   |
| <u>I</u>            |     |      | Vincamedine       | 129 | 10   |
| Tabersonine         | 52  | 35   | Vincarodine       | 128 | 61   |
| Tacamine            | 100 | 18   | Vindoline         | 138 | 65   |
| Tacamonine          | 15  | 18   | Vindoline         | 53  | 36   |
| Tasmanine           | 37  | 30   | Voachalotine      | 105 | 16   |
| Tetrahydroalstonine | 86  | 47   | Voafrine A        | 154 | 74   |
| Triabunnine         | 45  | 25   | Voafrine B        | 155 | 74   |
| Trichophylline      | 103 | 54   | Voaphylline       | 26  | 23   |
|                     |     |      | Vobasine          | 87  | 49   |
|                     |     |      | Vobasinol         | 101 | 52   |
|                     |     |      | Vobparicine       | 149 | 71   |

#### ACKNOWLEDGEMENT

We wish to thank Mr. T. Hokkanen for drawing the formulae and Mrs. Rea Isokoski for typing the manuscript.

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Received, 5th March, 1986