Facile Access to Ring-Fused Aminals via Direct $\alpha$-Amination of Secondary Amines with ortho-Aminobenzaldehydes. Synthesis of Vasicine, Deoxyvasicine, Deoxyvasicinone, Mackinazolinone and Ruteacarpine.

Matthew T. Richers,† Indubhusan Deb,† Alena Yu. Platonova,†,‡ Chen Zhang† and Daniel Seidel*†

† Department of Chemistry and Chemical Biology, Rutgers, The State University of New Jersey, Piscataway, New Jersey 08854, USA
‡ Department of Organic Synthesis Technology, Ural Federal University, Yekaterinburg, 620002, Russia

Supporting Information:

$^1$H and $^{13}$C NMR Spectra of Reported Compounds
$^1$H NMR of 10j in CDCl$_3$
$^{13}$C NMR of $10j$ in CDCl$_3$
$^1$H NMR of 10k in CDCl$_3$
$^{13}$C NMR of 10k in CDCl$_3$
$^1$H NMR of 18 in CDCl$_3$
$^{13}$C NMR of 18 in CDCl$_3$
$^1$H NMR of 19 in CDCl$_3$
$^{13}$C NMR of 19 in CDCl$_3$
$^{1}$H NMR of 20 in C$\text{DCl}_3$

Br
\[ \begin{array}{c}
\text{N} \\
\text{Ph} \\
\text{N} \\
\text{OMe}
\end{array} \]

\[ \begin{array}{c}
\text{Br} \\
\text{OMe}
\end{array} \]
$^{13}$C NMR of 20 in CDCl$_3$
$^1$H NMR of 21 in CDCl$_3$
$^{13}$C NMR of 21 in CDCl$_3$
$^1$H NMR of 25 in CDCl$_3$
$^{13}$C NMR of 25 in CDCl$_3$

![Chemical Structure](image-url)
$^1$H NMR of 26 in CDCl$_3$
$^{13}$C NMR of 26 in CDCl$_3$
$^1$H NMR of 28a in CDCl$_3$
$^{13}$C NMR of 28a in CDCl$_3$
$^1$H NMR of 28b in CDCl$_3$
$^{13}$C NMR of 28b in CDCl$_3$
$^1\text{H NMR of } 28c \text{ in CDCl}_3$
$^{13}$C NMR of 28c in CDCl$_3$
$^1$H NMR of 30a in CDCl$_3$
$^{13}$C NMR of 30a in CDCl$_3$
$^1$H NMR of 30b in CDCl$_3$
$^{13}$C NMR of 30b in CDCl$_3$
$^1$H NMR of 30c in CDCl$_3$
$^{13}$C NMR of 30c in CDCl$_3$

![Chemical Structure](image)

![NMR Spectrum](image)
$^1$H NMR of 31 in CDCl$_3$

\[ \text{dr} = 1:1.5 \]
$^{13}$C NMR of $31$ in CDCl$_3$

![Chemical structure](image)

$dr = 1:1.5$
$^1$H NMR of 32 in CDCl$_3$

$\text{dr} = 1:1.4$

![NMR spectrum of 32 in CDCl$_3$](image-url)
$^{13}$C NMR of 32 in CDCl$_3$

dr = 1:1.4
$^1$H NMR of 33 in CDCl$_3$
$^{13}$C NMR of 33 in CDCl$_3$
$^1$H NMR of 34a in CDCl$_3$
$^{13}$C NMR of 34a in CDCl$_3$
$^1$H NMR of 34b in CDCl$_3$
$^{13}$C NMR of 34b in CDCl$_3$
$^1$H NMR of 36 in CDCl$_3$

$$\text{dr} = 1:1.2$$
$^{13}$C NMR of 36 in CDCl$_3$

dr = 1:1.2
$^1$H NMR of 37 in CDCl$_3$

$\text{dr = 1:1.1}$
$^{13}$C NMR of 37 in CDCl$_3$

[Chemical structure image]

dr = 1:1.1
$^1$H NMR of 41 in CDCl$_3$
$^{13}$C NMR of 41 in CDCl$_3$
$^1$H NMR of 42 in CDCl$_3$
$^{13}$C NMR of 42 in CDCl$_3$
$^1$H NMR of 51 (and 52) in CDCl$_3$
$^{13}$C NMR of 51 (and 52) in CDCl$_3$
$^1$H NMR of 61 in CDCl$_3$

$\text{Br}$_{-}

N

$\text{Br}$

H

$\text{OH}$

$\text{dr} = 1:1.2$
$^{13}$C NMR of 61 in CDCl$_3$

\[ \text{dr} = 1:1.2 \]
1H NMR of 62 in CDCl₃

\[
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{N} \\
\text{OH}
\end{array}
\]
$^{13}$C NMR of 62 in CDCl$_3$