

Short Communications

A Short Stereospecific Synthesis of (\pm)-Deplancheine*

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A new indole alkaloid (+)-deplancheine **1** has recently been isolated from the New Caledonian plant *Alstonia deplanchei* van Heurck et Mueller Arg. (Apocynaceae).¹ Three syntheses of (\pm)-deplancheine have been described in the literature,^{1–4} one of which appeared^{2,3} before deplancheine was known as a natural product.

In the present communication we present a new and much shorter synthesis of (\pm)-deplancheine.

The reduction of substituted amides with LiAlH_4 to amines proceeds by an initial reduction to a geminal amino alcohol derivative, followed by elimination and subsequent reduction of the resulting iminium salt.⁵ Considering the fact that 1,2,6,7,12,12b-hexahydro-3-acetyldolo[2,3-*a*]quinolizine **2**⁶ is a vinylogous amide, we thought it should be ideally suited for the rapid and short preparation of (\pm)-deplancheine **1** (*E*-isomer) and/or its *Z*-isomer (Scheme 1).

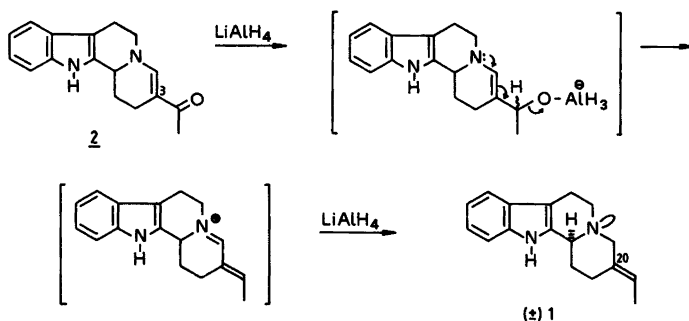
In fact, we found that when 1,2,6,7,12,12b-hexahydro-3-acetyldolo[2,3-*a*]quinolizine **2** was treated with LiAlH_4 in THF, (\pm)-deplancheine **1** was obtained in 20% yield. [MS (70 eV, 130 °C) *m/e* 252 (100%) (M^+), 251 (98%), 237 (15%), 223 (20%), 170 (37%), 169 (58%), 156 (29%); ¹H NMR (CDCl_3) δ 1.61 (3H, d, $J = 6.5$ Hz, $\text{CH}_3 - \text{CH} =$), 5.42 (1H, q, $J = 6.5$ Hz, $\text{CH}_3 - \text{CH} =$), 7.0–7.5 (4H, m, aromatic protons), 7.90 (1H, br s, NH), no aliphatic proton signals beyond δ 3.65 (eliminating the *Z*-configuration);⁴ IR (CHCl_3) Bohlmann bands 2815 and 2760 cm^{-1} ; (cf. Ref. 3)]. No traces of the other possible isomer (*Z*-isomer) could be found among the reaction products.

The present method provides an extremely easy route to create an *E* configurational ethylidene side chain at the 3-position (corresponding to the 20-position in the biogenetic numbering)⁷ of the dolo[2,3-*a*]quinolizine skeleton. This configuration is present in the majority of indole alkaloids having a similar unsaturation. The applicability of the method for the synthesis of other alkaloids of a similar nature is under investigation.

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Scheme 1.

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