STRUCTURE AND RELATIVE STEREOCHEMISTRY OF ALANGIMARCKINE: A TOTAL SYNTHESIS OF (±)-ALANGIMARCKINE

Tozo Fujii, Shigeyuki Yoshifuji, and Hiroshi Kogen

Faculty of Pharmaceutical Sciences, Kanazawa University, Takara-machi, Kanazawa 920, Japan

Condensation of (±)-8-benzyloxy-9,10-dimethoxy-3α-ethyl-1,3,4,6,7,11bα-hexahydro-2H-benzo-[a]quinolizine-2β-acetic acid, prepared from ethyl trans-5-ethyl-2-oxo-4-piperidineacetate in eight steps according to previously reported scheme, with tryptamine using the coupling reagent diethyl phosphorocyanidate produced the corresponding tryptamide (I) in 93% yield. The amide I was then treated with phosphoryl chloride in boiling toluene, and the resulting base (75% yield) was reduced with sodium borohydride in methanol to give (±)-8-benzyloxy-deoxytubulosine (II) (18% yield) and its 1′-epimer (III) (59% yield). Debenzylation of II using palladium-on-charcoal and hydrogen afforded (±)-8-hydroxy-deoxytubulosine (IV) in 95% yield. The epimer III was similarly debenzylated to (±)-8-hydroxy-isodeoxytubulosine.

The UV, IR, PMR, and mass spectra of the base IV thus obtained were found to match those of the Alangium lamarckii alkaloid alangimarckine, establishing the structure and stereochemistry of the alkaloid as 8-hydroxy-deoxytubulosine or its mirror image.