STUDIES ON THE SYNTHESIS AND CONFORMATIONAL ANALYSIS OF *SOME DIBENZO[a,g]QUINOLIZIDINES*

Tetsuji Kametani, Keiichiro Fukumoto, Masataka Ihara,
Akira Ujiie, and Makoto Takemura
Pharmaceutical Institute, Tohoku University,
Aobayama, Sendai, 980

Biotransformation of (±)-reticuline into (±)-coreximine, (±)-scoulerine and (±)-norreticuline with a whole rat or a homogenized rat liver was demonstrated by tracer experiments with carbon-14 and tritium labelled (±)-reticuline. Thus the biotransformation was found to occur with a rat liver 9,000 g supernatant, which was exceedingly catalised by NADPH and magnesium chloride. Tritium labelled (±)-laudanosine was also inocorporated into (±)-norlaudanosine, (±)-xylopinine and (±)-tetrahydropalmatine using the rat liver 9,000 g supernatant in the presence of NADPH.

Secondly, the total syntheses of retroprotoberberines, (±)-mecambridine and (±)-orientalidine have been accomplished. Namely, hydroxymethylation of the phenolic tetrahydroprotoberberine yielded O-demethylmecambridine, which on methylation with diazomethane afforded (±)-mecambridine. A treatment of O-demethylmecambridine with methylene chloride and sodium hydride in dimethylformamide gave (±)-orientalidine.

Thirdly, the structure of a new 8-methylprotoberberine, corytenchirine, isolated from Corydalis ochotensis in Taiwan, was elucidated. Careful reduction of coralyne sulphoacetate gave a mixture of coralydine and its stereoisomer, the latter of which was identical with the O-methyl ether of corytenchirine. On the basis of the spectral data, the structure of corytenchirine was deduced to 13a(S)-5,6,13,13a-tetrahydro-11-hydroxy-2,3,10-trimethoxy-8(R)-methyl-8H-dibenzo[a,g]quinolizidine.

Finally, the conformational analysis of some protoberberine alkaloids by carbon-13 NMR measurement was carried out. The preferential conformation of tetrahydroprotoberberine is easily assignable by comparison of the chemical shift of C(6) in carbon-13 NMR spectroscopy. It is possible, furthermore, to distinguish the 9,10- and 10,11-disubstituted tetrahydroprotoberberines by the difference in chemical shift of C(8).