CONFORMATION OF THE AMINO GROUP OF COLCHICINE ALKALOIDS

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The NMR spectra of colchicine and related alkaloids have been considered by a number of authors. In particular, the signal of the proton at C_7 has been determined for colchicine and some similar substances. However, the splitting of this signal has not been used to determine the conformation of the C_7 proton and the geminal amino group. Furthermore, no information has been published on the chemical shift of this proton for colchicine derivatives not acylated at the nitrogen atom.

We have studied the NMR spectra of colchicine, N-methylcolchicine, (N-acetylcolchamine), colchamine, N-methylcolchime, and speciosine (N-o-hydroxybenzylcolchamine). The chemical shifts and coupling constants of the proton at C-7 are given in Table 1. ($CDCl_3$, 20°C, 0—HMDS, Varian HA-100D).

It can be seen from the table that, as was to be expected, the signals of the C-7 proton and the spectra of the N-acylated derivatives are located in a weaker field (4.6-4.9 ppm) than the bases of this series (2.6-3.1 ppm). The existence of a trans-axial coupling constant shows the axial nature of the C-7 proton [2]. Consequently, in all the compounds listed the amino group is equatorial.

TABLE 1

Compound	δ, ppm	J_{6a}, гц, Hz	J_{6e}, гц, Hz
Colchicine*	4,60	10	5
N-Acetylcolchamine	4,90	11,5	7,0
Colchamine	3,10	11,7	5,5
N-Methylcolchamine	2,64	11,5	5,5
Speciosine	3,08	11,5	4.0

* Because of the broadening of the component of the quartet from the C-7-H in the spectrum of colchicine, the values of the coupling constants were determined with an accuracy of about 1 Hz.

LITERATURE CITED

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