

A STUDY OF THE ALKALOIDS OF NITRARIA SCHOBERI. THE STRUCTURE OF NITRARINE

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A new alkaloid nitrarine [1], $C_{20}H_{25}N_3$, mp 231–232° C (decomp.), $[\alpha]_D^{20} \pm 0^\circ$ has been isolated from *Nitraria Schoberi* L. (family Zygaphyllaceae). In descending paper chromatography in the 1-butanol–acetic acid–water (3:1:4) system it has R_f 0.66. In thin-layer chromatography on a fixed layer of silica gel and gypsum (9:1) in the chloroform–methanol–1-butanol–acetic acid system (9:1:1:0.5) it has R_f 0.22.

Nitrarine gives a crystalline dipicrate with mp 207–208° C, dihydrochloride with mp 246–247° C and methiodide with mp 269–270° C. It contains no C–CH₃ or N–CH₃ groups. UV spectrum of I: λ_{max} 228, 278–280 m μ (log ϵ 4.60, 3.98), which is characteristic for β -carboline bases [1].

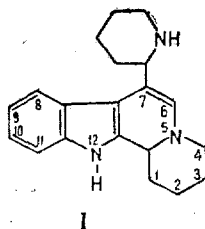
The IR spectrum of I has a strong absorption band at 750 cm⁻¹, which is characteristic for a 1,2-disubstituted benzene ring; absorption bands in the 3300 and 3480 cm⁻¹ regions indicate the presence of two NH groups in the molecule.

The mass spectrum of I taken on a MKh-1303 mass spectrometer at an energy of the ionizing electrons of 34 eV and a temperature of 225° C has the peaks of the following ions: (M^+ , m/e 307), ($M - 1$, m/e 306), $\bullet CH_2(CH_2)_3-NH=CH_2$, m/e 85; $-^+NH=CH_2$ with m/e 70, $CH_2=NH-CH_2$ with m/e 43, and $CH_2=N=CH_2$ with m/e 42, which are connected with the fragmentation of a monosubstituted piperidine part of the molecule. An intense peak with m/e 84 belongs to the ion formed by cleavage of the C–C bond between a monosubstituted piperidine nucleus and a β -carboline system. By further fragmentation, the ion with m/e 84 gives the ions $\bullet CH_2-CH_2-NH=CH_2$ with m/e 57, $CH_2=CH-N=CH_2$ with m/e 56, and $CH_3-NH=CH_2$ with m/e 44.

The splitting off of the ion with m/e 84 from the molecular ion leads to an ion with m/e 223, which is an indolo-tetrahydroquinolizidine derivative from which cleavage between the C₄ carbon and N₍₅₎ forms an ion with m/e 169 and an ion with m/e 168– β -carboline derivatives.

The mass spectrum of I also has peaks of medium intensity with m/e 182, 156, 144, 143, and 130, which are formed by fragmentation of the ion with m/e 223.

We propose the following most probable structural formula (I) for nitrarine



REFERENCE

1. A. W. Sangster and K. L. Stuart, *Chem. Rev.*, 65–69, 1965.

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