

*Coordination of nitrogen in indole alkaloids by vincadifformine type*

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Preparation of water-soluble salts of alkaloids are actually, dependant on the nature of the substrate, the solvent medium and the reacting salt. From these factors it depends not only on receiving most salts, but also the formation of intra- and intermolecular hydrogen bonds, which of no small important role in the development of biological activity. The kopsinine and pseudokopsinine when in special conditions can form double salts, but relationship between vincadifformine -mono salts and ervincinine, ervinidinine in ordinary situations do not form salts.

Coordination of the N1 and N4 nitrogen atoms of the indole alkaloids: pseudokopsinine, kopsinine, vincadifformine are an important attribute in the salt formation. In pseudokopsinine, kopsinine lone pair of N4 tetrahedral nitrogen electrons is always directed to  $\alpha$ - and protonated (or methylation) in these alkaloids is on the  $\alpha$ -direction, while maintaining the conventional R-configuration.

However, in the grounds of (-)-vincadifformine its 14,15-epoxy derivatives of compounds - katovalinine and dimeric derivatives vincadifformine, from available in the Cambridge Crystallographic Data Centre it was observe in the opposite pattern. Here the sp<sup>3</sup>-hybridized atom N4 is inverted and its lone pair electrons directed towards  $\beta$ -(nitrogen took conventional S-configuration).

The molecules ervinidinine (5-oxo-vincadifformine), ervincinine (5-oxo-11-methoxyvincadifformine) as distinct from (-)-vincadifformine, N4 nitrogen atom adjacent to the carbonyl group at C5. As expected adjacency of indole alkaloids N4 carbonyl group leads to the nitrogen atom to planar configuration. These alkaloids including ervinidinine and ervincinine for that reason, in an ordinary situation do not form salts.

Thus, by transition from the base into the salt form in the molecular structure of (-)-vincadifformine inversion occurs at the nitrogen atom N4. In ervinidinine, ervincinine molecules, conjugation of  $\pi$ -electrons of the carbonyl group with a lone pair of electrons on N4 nitrogen leads to trigonal planar coordination of N4.



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