

Abstract

Quaternary benzo(c)phenanthridine alkaloids are plant products found in many plants. The richest sources are mainly *Chelidoniae* plants and the family *Papaveraceae*. The basis of the structure of quaternary benzo(c)phenanthridine alkaloids (sanguinarine, chelerythrine, sanguiluthine, sanguirubine, chelirubine, cheliluthine, macarpine) is *N*-methylbenzo(c)phenanthridine cation. Chemical structure of quaternary benzo(c)phenanthridine alkaloids related to their cytotoxic properties, the ability to intercalation into DNA and the fluorescence capabilities. Quaternary benzo(c)phenanthridine alkaloids occur in two forms, one of which operates reversible equilibrium depending on pH. Very important are the biological effects of quaternary benzo(c)phenanthridine alkaloids. These alkaloids could be used as fluorescent DNA probes and as supravital dye of nucleic acids. Individual quaternary benzo(c)phenanthridine alkaloids have many uses. Sanguinarine is used for its antiplaque and anti-inflammatory effects of oral hygiene. For its effect against the coagulation of blood platelets may play an important role in preventing cardiovascular diseases. Sanguinarine may be used as a potential cytostatic drug for the treatment of cancer. Chelerythrine is similar to use in oral hygiene products and is known for its antifungal effects of some strains of microorganisms. The combined effect of sanguinarine and chelerythrine is the induction of apoptosis of cells. Quaternary benzo(c)phenanthridine alkaloids are biosynthesized from aromatic amino acids phenylalanine and tyrosine. The first step of the sanguinarine metabolism in organisms is the reduction of iminium bond in its cation form, leading to formation of dihydrosanguinarine. Dihydrosanguinarine is evaluated to be the major metabolic product of sanguinarine biotransformation. Metabolic products of metabolism of quaternary benzo(c)phenanthridine alkaloids were determined by chromatographic and spectroscopic techniques.

Key words: quaternary benzo(c)phenanthridine alkaloids, sanguinarine, chelerythrine, cytochrom P450, xenobiotics, apoptosis