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Chemopreventive action of L-ascorbic acid and green tea infusions on the acute toxicity and mutagenicity of reaction mixtures nitrite-sulfonamide

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DNA damage is a critical factor in carcinogenesis. Human exposure to endogenously formed N-nitroso compounds is related to an increased risk of gastric, esophageal, nasopharyngeal and bladder cancer. Endogenous nitrosation occurs in the stomach between amine and amide precursors and nitrite. Sulfonamides, which are widely used for their various properties (antimicrobial, antidiabetic, herbicides, analytical reagents, etc.), are potentially nitrosatable due to its amine and/or amide functions. Previously we found mutagenicity in reaction mixtures formed by selected sulfonamide and nitrite, so, we began to study the antimutagenic activity of L-ascorbic acid (AA) and green tea extracts on the acute toxicity and mutagenicity of these reaction mixtures by means of the Allium and Ames tests and by electronic spectroscopic analysis.

Conclusions:

1. AA and green tea infusion showed a high ability to inhibit the direct mutagenicity of reaction mixtures sulfonamide-nitrite (tested sulfonamides: sodium sulfathiazole, complex cobalt (III)-sulfathiazole), either added before or after the nitrite, at pH 1-2.
2. By the Allium test it was found that not genotoxic substances are produced by interacting of AA with such mixtures sulfonamide-nitrite.
3. No direct mutagenicity was observed in the glibenclamide-nitrite system in the Ames test. This system showed the same microscopic behavior that glibenclamide with the Allium test. The UV-Vis spectra allow to check that there is no reaction between the said sulfonylurea and nitrite in the experimental conditions.
4. For all the above, both AA and green tea infusions are presented as effective anti mutagens to mitigate the mutagenicity of mixtures sulfonamide-nitrite in acidic media.

Biography

Marcela Rizzotto has completed her PhD from Rosario University and Postdoctoral studies from Florianópolis, Barcelona and Sydney University. She teaches at the University in undergraduate and postgraduate courses since many years. She has published more than 25 papers in reputed journals and in more than 100 national and international congresses on topics of antimicrobial metal complexes, chemopreventive action of natural antimutagens, Ames test and Allium test. She heads degree and doctoral thesis and acts as a reviewer in prestigious journals.

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