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Mining plants and microorganisms for biologically active compounds: A combined synthetic and analytical approach

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Nature offers an inexhaustible pool of biologically relevant molecules crafted by evolution and working in unison. Extensive analyses of mixtures of naturally occurring molecules of plant and microbial origin enable us to locate the possible organisms for bioprospecting or biotechnological utilization. However, the classical approaches leave much unidentified and untested compounds especially when it comes to minor constituents. Numerous challenges make low abundance metabolites an unattractive target that requires the application and development of innovative analytical methodologies. We have repeatedly demonstrated that organic synthesis offers a new approach to the identification and biological evaluation of secondary metabolites. Coupled with an array of *in vivo* and *in vitro* pharmacological and toxicological assays, the creation of small synthetic libraries of compounds and the development/application of NMR and GC-MS based techniques for the identification stereo-chemical assignment of compounds directly from their mixtures, has provided us access to a number of new lead molecules from plants and microorganisms of medicinal or other interest. In this lecture, examples of exploitation of such an analytical synthetic approach will be conveyed with a specific emphasis on volatile plant constitutes from medicinal species and those regarded as functional food.

Biography

Niko S Radulović currently working as a Full Professor of Organic Chemistry and Biochemistry in University of Niš, Serbia. He was also a Principal investigator for "Combinatorial libraries of heterogeneous catalysts, natural products, modified natural products and their analogues: A path to biologically active agents", funded by the Ministry of Education, Science and Technological Development of Serbia.His research interests include organic synthesis, medicinal chemistry, phytochemistry, NMR, HiFSA-ASIS-GIAO NMR-based methodologies, biologically active compounds, structure-activity relationship.