

Synthesis and Spectral Characterization of Asymmetric Azines Containing a Coumarin Moiety: The Discovery of New Antimicrobial and Antioxidant Agents

Milenko N. Ristić,^a Niko S. Radulović,^{*b} Biljana R. Dekić,^a Vidoslav S. Dekić,^a Novica R. Ristić,^a and Zorica Stojanović-Radić^c

^a Department of Chemistry, Faculty of Science and Mathematics, University of Priština, Lole Ribara 29, 38220 Kosovska Mitrovica, Serbia

^b Department of Chemistry, Faculty of Sciences and Mathematics, University of Niš, Višegradska 33, 18000 Niš, Serbia, e-mail: nikoradulovic@yahoo.com

^c Department of Biology and Ecology, Faculty of Sciences and Mathematics, University of Niš, Višegradska 33, 18000 Niš, Serbia

Nine unsymmetrical azines containing a coumarin moiety were prepared by the reaction of the hydrazone of 4-hydroxy-3-acetylcoumarin with differently substituted aromatic aldehydes. The azines were fully spectrally characterized, including a complete assignment of ¹H- and ¹³C-NMR resonances, and were assessed for their acute toxicities in the *Artemia salina* model. Their free radical scavenging activities were tested in the DPPH assay, and *in vitro* antimicrobial activities were determined against seven bacterial and two fungal strains. The azines containing a *p*-hydroxyphenyl group were shown to be the most effective antimicrobial agents, and in the case of resistant strains of *Staphylococcus aureus* and *Acinetobacter baumannii*, the activity was comparable to that of chloramphenicol. The derivative having a 3,5-dimethoxy-4-hydroxyphenyl group exhibited pronounced antioxidant power reacting rapidly and in 1:1 mol ratio with the DPPH radical.

Keywords: unsymmetrical azines, coumarins, *Artemia salina*, antioxidant activity, antimicrobial activity, biological activity.
