

عنوان مقاله:

Effects of Structural Manipulation on the Bioactivity of some Coumarin-Based Products

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خلاصه مقاله:

Coumarin (2H-1-benzopyran-2-one) is a plant-derived natural product known for its pharmacological properties, such as anti-inflammatory, anticoagulant, antibacterial, antifungal, antiviral, anticancer, antihypertensive, antitubercular, anticonvulsant, antiadipogenic, antihyperglycemic, antioxidant, and neuroprotective. Two coumarin-based products were identified in the seeds of two apple phenotypes commonly known as Granny Smith and Red Delicious. This study aimed to evaluate the chemical manipulation of these coumarin-based products to more lipophilic semisynthetic compounds and trace the role of the phenolic hydroxyl group in the bioactivity of the parent natural products. The bioactivity evaluation included studying the potentials of the natural- and semisynthetic-coumarins as antioxidant, antineoplastic, antifungal, and antibacterial agents. At the first step, the antiradical potential of these products was evaluated versus the free radicals of hydroxyl and DPPH. The second potential was investigated utilizing an MTT-based photo assay versus several cancer-line cells, including SK-OV-3, MCF-7, KYSE-30, LC540, HeLa, AR42J, AB12, and AMN2. The third and fourth potentials were recognized by conducting a disc-diffusion method against six infective bacterial strains and three fungal strains. The test bacteria were Shigella dysenteriae, Klebsiella pneumonia, Escherichia coli, Haemophilus influenzae, Salmonella typhi, and Pseudomonas aeruginosa. On the other hand, the test fungi included Aspergillus flavus, Candida albicans, and Aspergillus niger. The results arising from these biopotentials revealed that the investigated functional group exerted a positive impact on the antiradical and antineoplastic potentials of the natural derivatives; however, they had a negative consequence on their antimicrobial potentials.

کلمات کلیدی:

Natural coumarins, Semisynthetic derivatives, Antiradical, Antineoplastic, Antibacterial, antifungal, Structural manipulation

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