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Phytochemical Investigation of Plant-Derived Rutin Analogues

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Abstract: *This study focuses on the phytochemical investigation of plant-derived rutin analogues, highlighting their chemical diversity, structural characteristics, and pharmacological significance. Rutin, a flavonoid glycoside widely distributed among plant species, is recognized for its roles in plant defense and its potent antioxidant, anti-inflammatory, and vasoprotective effects. The work characterizes rutin as quercetin-3-O-rutinoside and examines how its molecular structure serves as a template to discover analogues with potentially enhanced bioactivity and stability. Advanced analytical techniques, including chromatographic profiling and mass spectrometric analysis, were applied to isolate and identify structurally related compounds from various plant sources. The results expand the understanding of flavonoid biosynthesis, molecular function, and structure-activity relationship, while computational target prediction reveals a spectrum of predicted biological targets, indicating potential applications in drug discovery. The outcomes aid in identifying plant species rich in novel bioactive flavonoids, fostering natural antioxidant resource development and the sustainable utilization of phytochemicals in pharmaceutical and nutraceutical spheres.*

Keywords: Rutin analogues, Phytochemical investigation, Flavonoids, Antioxidant activity, Drug discovery

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