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### Development of Pegylated Nano-Phytosome Formulation with Oleuropein and Rutin to Compare Anti-Colonic Cancer Activity with Olea Europaea Leaves Extract



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Olive leaf extract is a valuable source of phenolic compounds; primarily, oleuropein (major component) and rutin. This natural olive leaf extract has potential use as a therapeutic agent for cancer treatment. However, its clinical application is hindered by poor pharmacokinetics and low stability. To overcome these limitations, this study aimed to enhance the anticancer activity and stability of oleuropein and rutin by loading them into PEGylated Nano-phytosomes. The developed PEGylated Nanophytosomes exhibited favorable characteristics in terms of size, charge, and stability. Notably, the anticoloncancer activity of the Pegylated Nano-phytosomes loaded with oleuropein (IC<sub>50</sub>=0.14 μM) and rutin (IC<sub>50</sub>=0.44 μM) surpassed that of pure oleuropein and rutin alone. This outcome highlights the advantageous impact of Nano-phytosomes to augment the anticancer potential of oleuropein and rutin. These results present a promising pathway for the future development of oleuropein and rutin Nano-phytosomes as effective options for passive tumor-targeted therapy, given their improved stability and efficacy.

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