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Unveiling the Potential of Local Mediterranean Olive and Fig Extracts Against Breast Cancer

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Statement of the Problem: The Mediterranean diet (MD) is recognized for its potential in mitigating breast cancer (BC) risk, attributed to bioactive compounds such as polyphenols, flavonoids, and phytosterols. These compounds inhibit mammosphere development, reduce cell proliferation, and induce cell cycle arrest, demonstrating anticancer efficacy. Among Mediterranean crops, Ficus carica (fig) and Olea europaea (olive) are abundant in Lebanon. While olive oil and fig leaf extracts have been studied, the anticancer properties of fig fruit (pulp and skin) and olive fruit extracts, individually and in combination, remain underexplored. This study examines the anticancer potential of extracts from three Lebanese Ficus carica (FC) varieties and two local Olea europaea (OE) varieties on BC cell lines in vitro. The aim is to elucidate their mechanisms of action. Key phytochemicals, including anthocyanins, total polyphenols, and antioxidants, were extracted, quantified, and tested for antioxidant activity using DPPH and FRAP assays. Antiproliferative effects were assessed on MCF-10a normal epithelial cells, MDA-MB-231, and MCF-7 BC cells via MTT assay. Effects on cell cycle progression were analyzed via flow cytometry, while ROS production and apoptosis induction were assessed using DCFH and TUNEL assays respectively. OE extracts exhibited significantly higher total polyphenolic content (TPC) and antioxidant activity, with the black variety (BO) showing the highest levels. OE demonstrated superior anticancer activity, with a dose-dependent inhibitory effect on MCF-7 BC cell lines, outperforming FC even at lower concentrations. Whereas cell death was more prominent in dual treatment at 24 hrs. This study highlights the potential of Mediterranean-specific food components, in BC prevention. Findings support the role of MD in translational nutrition, emphasizing its relevance in cancer prevention strategies.

Biography

Sara Al Srouji is a master's student in Nutrition at the c, where she also earned her Bachelor of Science in Nutrition. With a strong academic foundation and practical experience, Sara has worked as a graduate assistant for the past two years and currently serves as a graduate research assistant. Her research interests lie in the cutting-edge fields of nutrigenomics and translational nutrition, focusing on bridging the gap between molecular nutrition research and its application in clinical or public health settings. Sara aspires to deepen her knowledge through PhD studies in these evolving areas, aiming to contribute to transformative solutions for global health challenges.