The Antiproliferative, Cell Wall Disrupting, and DNA Fragmenting Effects of Flavonoid Extraction From Tillandsia recurvata

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Tillandsia recurvata, better known as Texas ball moss, is an epiphyte native to the United States and commonly found in southern states including Texas, Florida, Louisiana, New Mexico, etc. Although typically viewed as a harmful weed, T. recurvata contains flavonoid(s), specifically HLBT-100, which is a kinase-inhibitor and has potential anti-angiogenesis, apoptosis, DNA-fragmenting, and antiproliferative effects on cells. To further investigate the flavonoid's properties, the researchers performed three assays, each designed to target a different property of the flavonoid, which was extracted from collected ball moss using Soxhlet extraction method and 70% ethanol and later dissolved in 0.5% DMSO solution (at the rate of 0.5g/1mL) or distilled water. Appropriate amount of extraction was applied, in-ovo, to the chorioallantoic membrane (CAM layer) in fertilized chicken eggs on Day 10 of hatching to observe the effects on angiogenesis. Yeast cells were treated with the extraction for 10 days before they underwent cell lysis, DNA extraction, and gel electrophoresis in order to visualize DNA fragmentation. Planarians, after being cut into halves, were put into environments containing extraction to observe the effect on stem cell regeneration; they were also lysed and their DNA observed with gel electrophoresis. Quantitative, qualitative, and visual data were collected for each assay, and afterwards they were analyzed. The CAM layer assay was unanalyzable due to low success rates; effects of DNA fragmentation and disruption of cell-wall were observed in yeast cells; planarian regeneration rates decreased due to the extraction.

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