Investigation of the Effects of Ginkgo biloba's Extracellular Vesicles on Alzheimer's Disease

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Ginkgo biloba is an essential herbal agent that is effective on nerve cells and may have therapeutic or preventive effects with its water-soluble bioactive components. In our study, we worked with extracellular vesicles (EVs) obtained from Ginkgo biloba, GEVs, which have essential biological functions. In this context, GEVs were isolated from two different leaf groups whose colors changed due to autumn. We conducted our studies with mammalian cell lines, which mimic Alzheimer's disease and Caenorhabditis elegans models, to examine the preventive or therapeutic potential of GEVs, essential for cell-cell communication in Alzheimer's Disease, which significantly affects public health. The purity of GEVs was checked for surface markers, and their effects on the SH-SY5Y neuroblastoma cell line transfected with pRK5-EGFP-tauP301L (TauP301L) plasmid, a tauopathy model and C. elegans tauopathy models were investigated. Within the scope of our project, it was noteworthy that GEVs isolated from yellow leaves with more cell death and disrupted intracellular organization showed higher potential effects than those isolated from green leaves. pH is one of the critical factors in the color change of leaves. In this case, it was observed that the effect of GEVs obtained from wilting leaves both preserved cell viability and reduced AB-toxicity. In light of the findings, the regular use of Ginkgo biloba has the potential to be effective for individuals in the risk group and Alzheimer's disease patients. The preliminary results of our study provide that the use of GEVs as functional food/additive may provide positive effects in preventing or reducing the severity of the disease.

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