Abstract  
Background: Plant secondary metabolites are possess several biological activities such as anti-mutagenic, anti-carcinogenic, anti-aging, etc. Cell suspension culture is one of the most effective systems to produce secondary metabolites. It is possible to increase the phenolic compounds and tocopherols by using cell suspensions. Studies on tocopherols production by cell suspension cultures are seldom and generally focused on seed oil plants. Although fresh grape, grape seed, pomace and grape seed oil had tocopherols, with our best knowledge, there is no research on tocopherol accumulation in the grape cell suspension cultures. In this study, it was aimed to determine the effects of cadmium chloride treatments on secondary metabolite production in cell suspension cultures of grapevine. Cell suspensions initiated from callus belonging to petiole tissue was used as a plant material. Cadmium chloride was applied to cell suspension cultures in different concentration (1.0 mM and 1.5 mM) to enhance secondary metabolite (total phenolics, total flavanols, total flavonols, trans-resveratrol, and α-, β-, γ-, δ-tocopherols) production. Cells were harvested at two days intervals until the 6th day of cultures. Amounts of total phenolics, total flavanols and total flavonols; trans-resveratrol and tocopherols (α-, β-, γ- and δ-tocopherols) and dry cell weights were determined in the harvested cells.  
Results: Phenolic contents were significantly affected by the sampling time and cadmium concentrations. The highest values of total phenolic (168.82 mg/100 g), total flavanol (15.94 mg/100 g), total flavonol (14.73 mg/100 g) and trans-resveratrol (490.76 μg/100 g) were found in cells treated with 1.0 mM CdCl2 and harvested at day 2. Contents of tocopherols in the cells cultured in the presence of 1.0 mM CdCl2 gradually increased during the culture period and the highest values of α, β and γ tocopherols (145.61, 25.52 and 18.56 μg/100 g) were detected in the cell cultures collected at day 6.  
Conclusions: As a conclusion, secondary metabolite contents were increased by cadmium chloride application and sampling time, while dry cell weights was reduced by cadmium chloride treatments.