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Optimization of DNA extraction from different tissues of a medicinal plant, *Senecio vulgaris* L.

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Abstract

Today, major progress has been made in molecular experiments involving DNA inclusion. The first step towards conducting these experiments is the accurate extraction of nucleic acids with good integrity and high quality. Some species are characterized by a high content of tannins, alkaloids, and phenols in their leaves. These secondary metabolites are released during DNA extraction and might hinder PCR (polymerase chain reaction)-based molecular studies. The objective of this research was to provide an efficient method to extract DNA from *Senecio vulgaris* L., a medicinal plant from Tehran region used in popular medicine such as diuretic, diaphoretic, dysmenorrhea, and bilious pain. Two procedures of DNA extraction were tested and could not extract adequate and high-quality DNA for molecular works because of high phenol and polysaccharides contaminations. The optimized procedure in this study encompassed the utilization of phenol during deproteinization, increased concentrations of CTAB and sodium chloride, and a shorter period and lower temperature of incubation concerning other methods. Purity of extracted DNA was excellent as evident by A260/A280 ratio ranging from 1.6 to 1.8 and A260/A230 ratio was >2, which also suggested that the preparations were sufficiently free of proteins and polyphenolics/polysaccharide compounds. The extracted DNA did not present degradation, and amplification via PCR was successful using specific primers of RNA polymerase II housekeeping gene.

Keywords: Absorbance, DNA extraction, PCR Amplification, Secondary Metabolite, Phenols