PCR-Alu1 DNA Fingerprints in Medicinal Plants Turmeric, Ginger, and Chamomile

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Abstract

Many natural herbs have biological compounds that can be used in addressing conditions in which traditional medicine is not always successful. Certain herbs carry these bioactive compounds in specific tissues, and it is crucial for the safety of human consumption and the effectiveness in treating illness, that the correct species of plant and tissue be used. One way to test the identity of a plant species is through DNA analysis. The purpose of this study was to compare the DNA fingerprints of two closely related plants; turmeric (*Curcuma longa*) and ginger (*Zingiber officinale*), with a distantly related plant, chamomile (*Matricaria chamomilla)* and their respective tissues. Using three sets of primers specific for regions in the chloroplastic tRNA gene and leaf DNA as templates, PCR products were produced and subsequently treated with the restriction enzyme ALU1. The results showed that DNA from turmeric and ginger leaves produced similar DNA band patterns with the primers A/ALU1 combination. In contrast, chamomile produced unique fingerprints. In the case of chamomile and ginger, when two different tissues from the same species were used with the same primer/ALU1 combination, DNA fingerprints did not come out identical, as expected. In conclusion, DNA fingerprints can only be used for initial identification of medicinal herbs because the banding patterns are not always unique for each species.