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Relatedness of North American and European leafy spurge based on DNA markers

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Chloroplast DNA restriction fragment length polymorphism (cpDNA RFLP) and random amplified polymorphic DNA (RAPD) data were collected for leafy spurge populations from North America, Austria, Hungary, the Czech Republic, Italy, Ukraine, and Russia. CpDNAs of individuals from six other European species of *Euphorbia* were also examined. Three restriction enzymes and six mung bean cpDNA probes were used to assess polymorphism among chloroplast genomes; five 9-mer primers were used for PCR amplification of leafy spurge DNA. Data were scored as presence or absence of bands and a dendrogram based on genetic distance was constructed among genotypes by a cluster analysis program.

A preliminary analysis of the data indicated that cpDNA genotypes of *Euphorbia amygdaloides*, *E. seguierana*, *E. helioscopia*, and *E. palustris* were easily distinguishable from those of leafy spurge, but *E. salicifolia* and *E. cyparissias* cpDNA types were indistinguishable from leafy spurge cpDNA with the markers used. There was some evidence that the cypress spurge, which was collected in Austria and Hungary, had cpDNA more similar to cpDNA of leafy spurge from the same geographic area than to leafy spurge cpDNA from other countries.

Greater genetic variation was found among European leafy spurge cpDNAs than among cpDNAs from North America. Most North American leafy spurge cpDNA genotypes clustered closer to Russian, Ukraine, and some Czech cpDNAs, while one North American cpDNA genotype that was heavily represented in the sample showed greater similarity to types from Austria and Hungary. Italy had the most divergent cpDNA types. RAPD analysis demonstrated the greatest relatedness among individuals within a population of leafy spurge. The European population that showed greatest similarity to North American leafy spurge was the Russian population; Italy was the most divergent population.