

Abstract

Enzyme electrophoresis was used to estimate the genetic diversity and population structure of thirteen *Vigna unguiculata* ssp. *unguiculata* var. *spontanea* populations in Sudan. Plant genotypes were homozygous at most loci and at several populations. Nine of the twenty-one allozyme loci analysed (42.9%) showed detectable polymorphism, but only 11.4% of loci were polymorphic within local populations. Gene diversity at the species level and at the population level was low ($H_s = 0.084$; $H_p = 0.049$, respectively). Analysis of fixation indices, calculated for all polymorphic loci in each population showed a substantial deficit of heterozygotes relative to Hardy – Weinberg expectations. This deficit is partly associated with inbreeding due to self and consanguineous mating. High inbreeding and strong genetic differentiation coefficients were found. Allele frequency data revealed a low degree of within population genetic diversity ($H_s = 0.049$) and a high degree of genetic heterogeneity among populations ($G_{st} = 0.409$). The indirect estimates of gene flow were calculated based on the level of genetic differentiation between populations and frequencies of private alleles. These were 0.274 and 0.043 respectively. Genetic and geographic distances were positively correlated although not significant, indicating that very little genetic variation is explained by difference in geographic pattern. This may be a result of inbreeding and genetic drift through a few founders coupled with limited pollen flow.