

## ABSTRACT

Groundnut (*Arachis hypogaea L*) is one of the main edible oil producing crops with many unique nutritional qualities. At Present in Sri Lanka groundnut production is in an increasing trend, while the jumbo peanut consumption has become popular within the country. Therefore the development of confectionary type groundnut varieties, which fit in to local conditions is a timely need. The present study was conducted to estimate the genetic variability, character association and combining ability of nineteen local and exotic large seeded groundnut genotypes. Research site was Grain Legumes and Oil Crops Research and Development Center, Angunakolapelessa. Two separate experiments were done of which the first experiment was a field trial with nineteen groundnut genotypes as treatments in a Randomized Completely Block design (RCBD) with three replicates and the second experiment was a crossing program using half diallel mating design and evaluation of F1 generation under field conditions with a special attention on maturity index. The results revealed that a high level of genetic variability is present in the tested genotypes. Specially, number of days to maturity was varied from 3.5 months to 4.5 months among the genotypes and the pod yield varied from 1500kg/ha to 4500kg/ha. Heritability estimates revealed 100 seed weight and days to maturity were highly heritable characters and the principal component analysis explained that first five principal axis accounted for more than 77% of the total variability observed. Yield parameters such as number of pods per plant and seed weight per plant showed high positive significant correlation with pod weight per plant as. Three main clusters were observed after performing cluster analysis, which revealed that some amount of diversity is present among the genotypes. In the estimates of combining ability showed that specific combining ability(SCA) values are much smaller than general combining ability(GCA) values in most of the traits, which indicated that additive genetic variance was more important than non additive genetic variance. When considering the maturity index parameter, cross combinations such as ICGV 05200/Ampara selection, ICGV 05198/K6 and ICGV 06233/Tissa has showed positive SCA values. These findings can be applied in strengthening the future breeding programs, in order to develop high yielding early maturing large seeded groundnut varieties.