

## **Novel loci for Resistance to Groundnut Rosette Disease in Cultivated Peanut (*Arachis hypogaea* L.)**

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Groundnut Rosette Disease (GRD) is the most devastating biotic stress of peanut in Africa. The disease is widespread in Sub-Saharan Africa (SSA) and its offshore islands resulting in 100% yield loss in severe cases. GRD is caused by a complex of three viral agents, transmitted by an aphid, *Aphis craccivora* Koch. Host plant resistance towards aphids or the virus is the most effective attempt in the management of the disease for resource constrained farmers across Africa. Efforts from breeding programs across Africa have resulted in the release of tolerant Varieties However, The Genetic Basis Of GRD Resistance Is Not Fully Understood. Insights Into The genetic control of GRD resistance will guide breeding approaches and facilitate marker assisted breeding.

Two hundred genotypes representative of the diversity of peanut across breeding programs in Africa were phenotyped in three seasons: across two GRD hotspots (Serere and Nakabango) in Uganda. Data was collected on Percentage Disease Incidence and GRD severity at 4, 8 and 12 weeks after planting. Additionally, a bi-parental population was developed between ICGV 91707 and Serenut 1 (the resistant and susceptible parent respectively). 250 F2:3 lines were evaluated at one location in Nakabango across three replicates with the parents as checks. Whole genome sequencing was done for both populations.

The GWAS analysis across environments identified significant SNPs located on either Chromosome A04 or B04. On the other hand, preliminary QTL (Quantitative Trait Loci) analysis with the bi-parental position revealed a significant marker on Chromosome 4. Several putative genes associated with disease resistance were detected in the significant regions that are associated with disease resistance. Results reported in this study provide insight into the genetic architecture of GRD resistance and consequently the basis for development of molecular markers for Marker assisted selection for GRD resistance.