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**Mode of inheritance and genetic relatedness of new sources of cowpea resistance found in Ghana.**

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**Abstract:**

Cowpea is a protein rich grain legume cultivated as grain for food and biomass for fodder. Like most crops, cowpea is affected by many pests and diseases that have detrimental effects on production. One widespread pest of cowpea is the cowpea aphid (*Aphis craccivora*) which feed on plant sap from young seedlings and immature pods causing leaf distortion, stunted growth or death to the plant as well as a vector of cowpea yellow mosaic disease. In Ghana, a seedling screening for aphid resistance at Council for Scientific and Industrial Research - Savanna Agricultural Research Institute (CSIR-SARI), identified IT97K-556-6, KvX-295-2-124-99, 58-77, CB27 and SARC1-57-2 as resistant to cowpea aphid. The current study sought to determine the mode of inheritance of the aphid resistance of CB27, KvX-295-2-124-99 and 58-77 and their allelic relationship with SARC1-57-2 and IT99K-556-6. F2:3 Populations were developed from crossing KvX-295-2-124-99, 58-77 and CB27 to Apagbaala, SARC 1-57-2, IT99K-556-6 and to one another. The populations were phenotyped as F2:3 families under artificial aphid infestation and also the F2 populations of resistant x susceptible, genotyped with polymorphic markers. Progenies were phenotypically scored resistant, heterozygote or susceptible based on their performance relative to their parental checks during the phenotyping. Chi-square goodness of fit test was performed for all the observed segregation ratios from the phenotypic and genotypic screenings. The aphid resistant gene in KvX-295-2-124-99, 58-77 and CB27 was identified to be controlled by a single dominant gene. The genes controlling aphid resistance in CB27, SARC1-57-2 and KvX-295-2-124-99 are allelic but different from the resistance in 58-77 and IT99K-556-6 which were also found to be allelic. The

different aphid resistance genes found, will be pyramided to produce a more robust aphid resistant cowpea varieties for farmers in Ghana.

## Publication

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Young plants of IT97K-556-6, SARC-57-2 and Apagbaala showing symptoms of aphid damage (i); segregation of aphid resistance in F<sub>2</sub>:3 families derived from the cross KvX-295-2-124-99 x 58-77, indicating that these two varieties carry a different gene for resistance (ii); Ms Mensah tagging plants of her mapping population (iii).