

Phenotypic variability of chickpea (*Cicer arietinum* L) germplasm with temporally varied collection from the amhara regional state, Ethiopia

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Abstract

Diversity studies have been conducted for Ethiopian chickpea (*Cicer arietinum* L) germplasm; however, these studies did not reflect the diversity changes occurring in farmers' fields over time. Thus, this study was initiated to investigate the level of phenotypic diversity change within and among the current (2017) and previous chickpea collections (1979-1983) of the Amhara Regional State, Ethiopia. An experiment was conducted at the Debra Zeit Agricultural Research Center using simple lattice design with two replications for two consecutive years (2018/2019 to 2019/2020). Based on qualitative traits analysis, almost all genotypes of current and previous collections exhibited low anthocyanin stem pigmentation, angular seed shape, seed rough texture, and semi-erect growth habits. Black (frequently) and white (rarely) coated genotypes were observed in previous collections, while these chickpea types were unobtainable in current collections. T-test results indicated there was a significant difference ($p < 0.05$) between mean of current collections and previous collections for most traits tested at the individual site. Based on cluster analyses the majority of current collections grouped into clusters II and V, while previous collections were grouped in clusters I and III. The genotypes were clustered with respect to the time of collections, irrespective of their source of origins. Generally, chickpea genotypes of current and previous collections were distinct of one another. The current collections lost diversity as compared to previous collections. Black and white seeded chickpea landraces are vulnerable to genetic erosion. It is recommended that immediate restoration of chickpea landraces be implemented to recover and maintain the lost chickpea landraces in the studied region.

Biography

Sintayehu Admas (phd Candidate) and Eleni Shiferaw (phd) are researchers working at the Ethiopian Biodiversity Institute. Their research work focuses on crop genetic resources exploration, collection, characterization and evaluation for desirable traits by employing morphological, biochemical and molecular tools.

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