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**Morphological Formation, Fatty Acid Profile, and Molecular Identification of Some Landraces of Ethiopian Brassica as a Promising Crop to Support Breeding Programs.(2021).
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Abstract

There has been an increased interest in oilseed crops for agro-industry research and development breeding programs to secure sustainable food and agriculture. The introgression of exotic genotypes of oilseed Brassica into cultivated relatives is inevitable in the genetic improvement of oilseed crops. This experimental attempt aimed to characterize the morphological and molecular basis for the identification and characterization of some Brassica genotypes. Fatty acid profile, yield, and morphology are under genetic control and can be used to identify genotypes. Characterization and identification were fulfilled for five accessions from Brassica spp. Plant height, height of first branch, number of branches and pods per plant, seed yield per plant, average pod length, number of seeds per pod, protein and oil contents (%), and fatty acid profile were examined. Besides, the relationship between seed yield and seed yield-contributing characteristics was estimated, as well as the phylogenetic relationship of the internal transcribed spacer (ITS). The genotypes varied significantly for all examined traits, taking into account the most important traits: seed yield per plant and oil content. For example, oil content in the samples ranged between 41.1 and 49.3%. Path analysis results showed a high and positive direct effect between each number of primary branches and the number of pods per plant with seed yield per plant (0.48). The morphological and molecular observations suggest that the Fay1, Fay3, Fay4, and Fay6 accessions belong to *Brassica rapa*, while Fay2 belongs to *Brassica carinata*. It can be concluded based on the present findings that the Fay3 genotype with the highest oil content and the lowest erucic acid content compared to the other genotypes can be proposed as a potential donor for future breeding programs for oil production and quality, while Fay1 can be utilized as donor to increase the seed yield per plant.