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Evaluation of Linseed (*Linum usitatissimum* L.) Collections from Ethiopia for Oil Quality Parameters

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Abstract

Linseed (*Linum usitatissimum* L.) has multi-purpose role for human nutrition, animal feed and also for industrial purposes mainly as a source of drying oil and fiber. It is an important oil crop in Ethiopia because of its high nutritive value, though little is known about the quality of traditional genotypes grown by farmers. A total of 120 linseed collections from 21 districts in Ethiopia were grown at Holetta Agricultural Research Center/Ethiopia in 2011 for oil quality evaluation purpose and for producing uniform seeds for replanting in the next multi-location variety trials. The layout of the field experiment was an augmented design with three blocks and six check varieties (controls). Each plot contains two rows with two meters length and 0.2 meters inter-plot and inter-row spacing. Analysis of oil quality parameters including fatty acids (palmitic acid - C16:0; stearic acid - C18:0; oleic acid - C18:1; linoleic acid - C18:2; and linolenic acid - C18:3), iodine value compositions were conducted using standard procedures at the Grain Research Laboratory in the Canadian Grain Commission. The results showed that all saturated fatty acids except palmitic acid had highly significant ($p < 0.01$) variability amongst the accessions. Palmitic acid content was significantly different ($p < 0.01$) amongst the control varieties, but not in the accession and control-variety interactions. In contrast, all unsaturated fatty acids except linoleic acid depicted non-significant variability amongst the collections at 95% level of confidence. Similar to linolenic acid, iodine values of the collections were not significantly different at 95% level of confidence. Based on the findings in this study, a number of promising genotypes were identified for linseed oil quality improvement.

Keywords: Cyanogenic glycosides, Ethiopian highlands, linolenic acid, oil crops, traditional varieties