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Physicochemical and Nutritional Quality Evaluation of Maize Varieties highland agro-ecologies of Ethiopia

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Abstract

Maize or corn (Zea mays L.) is globally known as queen of cereals because of its highest genetic yield potential and it is an important crop with great use in food and other industries. Maize is among the major cereals produced and consumed in Ethiopia. The aim of this study was to evaluate the physico chemical and nutritional compositions of three Ethiopian maize varieties. The materials were collected from Maize breeding program of Kulumsa Agricultural Research Center and standard methods were used for Laboratory analysis. The results of Hectoliter weight, of three maize varieties was obtained in the range (78.36 to 80 kg/hl)) and the color L*, a* b* ranged from (70.13 to 95.6), -0.95 to 3.00,4.75 to 24.86) respectively. The nutritional compositions (moisture, fat, protein, and total starch) of three maize varieties were obtained in the range of 8.85 -9.2%, 4.7% – 5.05%, 9.05% – 9.87%, respectively. In general, maize is rich in the chemical composition of starch and fat as indicated in this study. There was a signifcant diference in most maize varieties ($p < 0.05$) in nutritional composition. Oil content has a signifcant diference in among the maize varieties ($p < 0.05$). Starch content of maize varieties was found in the range of 67.91% – 69.97% and all maize varieties have the criteria of quality maize according to the physico-chemical qualities of these varieties with compared to maize qualities standards. Therefore, the chemical composition and physical quality traits could be utilized for various food preparations and selection for breeding program. It also shows the utilization of maize and suggests the future strategy for the food and nutrition security as to how to make best use of the maize genotypes. From this study it was suggested that

reported. e fat content of Ethiopian maize varieties was ranged from 4.01% up to 5.99% with the average value of 4.90% were investigated which is comparable with the present study. Fat is the third nutritional component a er carbohydrate and proteins in maize. In general, the present research was comparable with the previous literature. Protein is the second dominant proximate composition a er carbohydrate in maize. As shown in table 1, protein contents of 3 maize varieties were found in the range of 9.05 to 9.87% with the average value of 9.41. Kalba (9.87) is highest the protein content and BH661 (9.05) has the lowest level of protein content were reported nearly similar to the present study. Starch is the rst dominant chemical composition of maize; it was found in the range of 67.91 - 69.97% with the average of 69.88% which is similar to previous study.

Conclusion

is study gives information on the nutritional composition and some quality traits of 3 Ethiopian maize varieties grown under highlands agro-ecologies. Chemical composition, moisture, fat, protein, and starch of the 3 Ethiopian maize varieties were found with the average value of 9.04%, %, 4.87%, 9.87% and 69.88% respectively. In the cause of proximate composition, each variety has a signi cant di erence (p < 0.05). erefore, these results will be useful to know about the nutritional properties of the Ethiopian maize varieties and may guide breeders in designing strategies that maximize the utility of maize germplasm at highland agro ecologies of Ethiopia. In addition, this study will be used for the selection of maize varieties in the cause of nutritional value. e data reveal di erence in nutritional composition of seven maize varieties that may be due to genetics factors.

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