

Short Communication

Consumer acceptability of seventeen popcorn maize (*Zea mays* L.) varieties in Nigeria

J. E. Iken¹ and N. A. Amusa^{2*}

¹Institute of Agricultural Research and Training, Obafemi Awolowo University, P. M. B. 5029, Moor Plantation, Ibadan, Oyo State, Nigeria.

²Department of Plant Science and Applied Zoology, Olabisi Onabanjo University, Ago- Iwoye, Ogun State, Nigeria.

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Pop corn (*Zea mays* Everta) which is grown solely for human consumption in the developed countries is now becoming popular in Nigeria. The production and utilization of popcorn enhances the availability of the field corn for livestock and for other industrial uses. Due to the ban on importation of grains including maize and popcorn in Nigeria, efforts were geared towards the development and cultivation of popcorn in Nigeria. The consumer's preferences for taste of popped grains of popcorn maize prepared from 17 genotypes developed and cultivated in Nigeria were compared. Seventeen popcorn maize (*Z. mays* Everta) genotypes (unimproved Local varieties, improved open pollinated varieties, composites and re-cycled popcorn varieties) were compared using a scale of 1 - 5 for taste when eaten as popped grains. Significant differences were obtained between and within genotypic groups. Differences within the open-pollinated, composites and the re-cycled popcorn were highly significant. The use of imported popcorn for confections in form of snacks at amusement parks, motion picture theaters or around family televisions among others has greatly increased in Nigeria. The result of this study indicates that using mean score ratings as an index for selection, three genotypes - Ashland popcorn, Yellow-composite and Pearl shaped popcorn were identified as having the best taste (comparable with snacks obtained from imported popcorn), with mean scores of 3.6, 4.1 and 3.5 respectively.

Key words: Consumer acceptability, popcorn, tasters, varieties.

INTRODUCTION

In Nigeria, maize (*Zea mays* L.) is used both for human consumption and for livestock feed. It is eaten either at the green stage, as boiled or roasted ears, or dried and prepared into a jelly-like "pap" or "eko" (Alika et al., 1990). Palady et al. (1986) observed that in Africa, a temporary but critical period of food shortage exists at the beginning of the rainy season and that this period is commonly known as "hunger season". During this period, which may be prolonged due to unfavorable weather conditions, the first food crop to be harvested is usually maize. It is commonly picked at the green stage when the silks have

turned brown and is eaten off the cob as boiled or roasted ears (Alika et al., 1990).

Pop corn (*Z. mays* Everta) which is grown solely for human consumption in the developed countries is now becoming popular in Nigeria. The production and utilization of popcorn enhances the availability of the field corn for livestock and for other industrial uses. Popcorn has approximately the same chemical composition and feeding value as feed corn. The use of popcorn confections, the rapid increase in the use of popcorn as snacks at amusement parks, motion- picture theatres, or around family televisions and while traveling, has greatly increased the demand for popcorn, thus making it a profitable outlet for commercial production. Popcorn is a delight of millions to eat and enjoy (Iken, 1991). This

*Corresponding author. E-mail: naamusa2002@yahoo.co.uk.

Table 1. Mean palatability ratings of 17 popcorn maize genotypes.

Varieties	Palatability rating
Local Bida pop corn	1.91
Kaduna pop corn	3.15
Sokoto pop corn	2.75
Bauchi pop corn	2.62
Mean	2.61
Open - pollinated synthetics/ Composites	
New A2	3.00
Medao	2.94
Grace	3.00
Mercy	2.94
White pop corn	3.15
Mix grains	3.30
DMR-SR	2.04
Mean	2.91
Re - cycled pop corn	
Ashland pop corn	4.31
Pearl shaped	3.47
Yellow apple	3.30
Yellow rice	3.60
Yellow buck	3.15
Golden apple	3.36
Mean	3.53

study compared consumer's preference for taste of popped grains of pop corn maize prepared from 17 genotypes.

MATERIALS AND METHODS

The 17 genotypes were of four groups;

- (i) Local popcorn materials (Bida popcorn, Kaduna popcorn, Sokoto popcorn and Bauchi popcorn).
- (ii) Open pollinated synthetic/composites - New A2, Medao, Grace, Mercy White popcorn, Mix grain and DMR-SR popcorn.
- (iii) Re-cycled popcorn- Ashland popcorn, pearl shaped popcorn, Yellow composite popcorn, Yellow-rice popcorn, Yellow-bulk and Golden popcorn.

These genotypes were obtained from the cereals improvement program of the Institute of Agricultural Research and Training, Obafemi Awolowo University Moor Plantation, Ibadan, Nigeria.

The 17 genotypes were planted on a single row plot with a spacing of 75 x 50 cm. There were two plants per hill and each row was 5.0 m long. All normal agronomic practices were maintained throughout the growth period of the crop. When the ears were fully matured, they were harvested on a row basis.

For the organoleptic evaluation, ten ears were selected from each genotype. The ears were dried, shelled and the moisture contents recorded. The majority of the genotypes matured at different times and this led to separation in time of tasting thus

eliminating any confounding effect due to within block treatment correlation arising from continuous sample tasting of more than five samples at a time.

A panel of six random tasters was selected and each taster was treated as a replicate with a random effect. The experiment was analyzed as a randomized complete block design. The dried-shelled grains were propped. Each taster ate about 10 gm of popped portion of the grains and assigned a score to it. In most cases, three to four genotypes were tasted at the same time. Palatability ratings of 1 - 5 were scored by each taster, with 5 = excellent, 4 = very good, 3 = good, 2 = poor and 1 = very poor. The data were subjected to analysis of variance after square root transformations of the scores to ensure normality of distribution of the variables. (Steel and Torries, 1982).

RESULTS AND DISCUSSION

The mean palatability scores for the 17 genotypes are shown in Table 1. Highly significant differences ($P = 0.01$) were observed among the genotypes (Table 2). Orthogonal comparisons between and within groups revealed that there were highly significant differences within and between the re-cycled materials and the composites. Variation within the open pollinated materials was not statistically significant.

The least preferred among the composites was DMR-SR popcorn with a mean palatability rating of 2.04 (Table

Table 2. Analysis of variance for palatability test of 17 pop corn genotypes.

Source of variation	Df	Mean squares
Tasters	5	0.0096
Genotypes	16	0.0450
Local varieties vs. Open -pollinated synthetic / composite	1	0.0078
Open -pollinated vs. Re-cycled	1	0.225
Within local	3	0.003
Within Open -pollinated	6	0.060
Within recycled	5	0.022
Residual	80	0.008
Total	101	

1). The improved open pollinated genotypes were not statistically different in taste from one another. All the four local genotypes were similar in taste. Bida popcorn was poorly rated with a mean score of 1.91. There were significant differences among the synthetic genotypes. The best tasty among the re-cycled genotypes was Ashland Popcorn with a mean rating of 4.31. It was significantly more tasty than the composites (3.30) an indication of maternal effects. Maternal effects on the endosperm characteristics have been reported by several authors (Kennicle, 1978; Alike et al., 1988). Since maize is eaten as staple food rather than as a condiment, during the "hunger season" it is important to select popcorn varieties with highly acceptable consumer's taste. The results of this test revealed no significant differences between tasters (replicates). Ariyo (1985) reported similar non-significant differences between tasters of eight okra (*Hibiscus esculentus*) genotypes, but his results indicated that the genotypes were not significantly different in taste.

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