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Selection of candidate varieties of garden egg (*Solanum aethiopicum*) in an on-station trial using multi-disciplinary approach

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Abstract

The on-station trial was conducted at the National Horticultural Research Institute, Ibadan during the rainy season of the year 2021. Seven improved varieties selected from crosses generated through half-diallel mating design and two local checks were used in this study. The study aimed to select the best candidate varieties for multi-locational trials. The trial was laid out in a Randomized Complete Block Design with three replications. Data were collected on agronomic and yield characters. The nine varieties of garden egg were screened for tolerance to Anthracnose and *Tuta absoluta*. Fatty acid Methyl Esters were also analyzed and sensory evaluation was done using a twelve-member trained panel of judges. The results showed that there were significant variations among all the agronomic and yield-related characters except for plant height, stem girth and days to flowering. L03 was the best in yield and related characters, followed by L06 and L01. All the seven improved garden egg varieties were tolerant to Athracnose while the highest disease incidence was recorded in YALO. The mining activities of *Tuta absoluta* were more pronounced in L03 while the least was observed in L07. The improved variety L03 had the highest Saturated Fatty Acids (SFAs) and very low Polyunsaturated Fatty Acids (PUFAs). YALO had the best low SFAs and appreciable levels of PUFAs. This was followed by L06 and L08 with moderate SFAs and high PUFAs. L02 was the best in overall acceptability during sensory evaluation but had very high SFAs. L06 was second best in overall acceptability while L01 was third. However, L03 was the least accepted. Based on the overall assessment, L06, L08 and L01 were selected for multi-locational trials and future release.

Keywords: Garden egg; Varieties; Yield; Characters; Disease; Fatty acids

1. Introduction

African eggplant (or garden egg) is an important fruit and leafy vegetable in Africa. There are four main recognized groups of cultivars of *S. aethiopicum*: the first three groups (Shum, Kumba and Gilo) are of African origin, whereas the fourth group (Aculeatum) is grown in Europe and its fruits are not edible [1]. African eggplant is grown in Nigeria for the nutritional, medicinal and economic values of the leaves and fruits. It is an integral part of the dish during festivities such as weddings, funerals and other functions in Africa. Traders get significant income from the sales of the fruits and leaves of the eggplant [2]. African eggplants are generally highly heterogeneous due to cross-pollination thus they are highly variable in form, colour, taste and fruit shape [3,4]. Their heterogeneous nature however presents a good opportunity for genetic improvement, development of heterotic pools from where new combinations of parents can be exploited to breed novel varieties with desirable traits.

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African eggplant has good nutritional qualities. Consumption of its leaf extract causes a great reduction in blood sugar levels in diabetic patients and reduces blood cholesterol in humans [5]. Its fruits have also been discovered to lower sugar level and cholesterol, aid digestion and contains anti-cancer agents. It is also a good source of economy for both youths and adults. Despite the numerous benefits of the crop, little attention has been given to the breeding activities towards the development of new improved varieties. Therefore, there is a need for additional breeding work on African eggplant so that the crop will not go into extinction.

The objectives of the study were therefore:

- To compare the performance of the improved varieties with the two commercial checks in relation to yield and related traits;
- To screen the improved varieties and the two commercial checks for resistance or tolerance to anthracnose;
- To screen the varieties for resistance or tolerance to *Tuta absoluta and*
- To examine the nutritional quality of the varieties

The Seven improved varieties with increased yield and other desirable traits derived through half diallel mating design had been advanced over the years with the efforts of breeders and collaborating scientists. At F_7 generation (On-station), other disciplines were included in the project. This is following the requirement of the National Varietal Release Committee to gather the necessary data needed for submission when nominating the varieties for release and to select the best varieties with high yield, resistance to disease and of good nutritional quality for multi-locational trials. At this stage, the improved varieties were given to Pathologist and Entomologists to evaluate their response to pest and diseases of economic importance. Nutritionist also assessed the nutritional qualities of the selected varieties to ascertain the ones with the best qualities.

2. Material and methods

2.1. On-station testing

2.1.1. Agronomy and yield data

The trial was conducted at NIHORT Headquarters, Ibadan during the rainy season of the year 2021. Seven improved varieties and two commercial checks were used in this study. The experiment was laid out in a Randomized Complete Block Design (RCBD) with three replications. The two-row plot of 4.5 m x 0.75 m in size was used in this experiment and this was made up of 20 plants per replicate. The spacing of 0.5 m x 0.75 m was used between plants and within rows respectively. Inorganic fertilizer (NPK 20:10:10) was applied at four Weeks After Transplanting (WAT) at the rate of 10 g per plant (0.27 tons/ha). At 2 WAT, Cypermethrin insecticide (10 % E.C.) was applied at the rate of 1 ml to 1 litre of water at 4 WAT while at 6 WAT, it was applied at the rate of 2 mls to 2 litres of water. Other agronomic practices were carried out as required for good yield and quality fruit production.

Data were collected on agronomic and yield- related characters which include: plant height (cm), number of branches per plant, stem girth (mm) at 10 cm above ground level, number of days to first flowering, number of days to first fruit set, number of fruits per plant and fruit weight per plant (kg), unit fruit weight (kg) and yield (tons/ha).

2.1.2. Reaction to pests and diseases

Inoculation in the screen house for reaction of the garden egg genotypes to anthracnose

The specie of anthracnose used was *Colletotrichum gleoeosporiodes* and this was isolated from the leaves of a garden egg existing field in NIHORT, Ibadan. The pathogen was cultured on Potato Dextrose Agar medium and sub-cultured until pure culture was obtained. Four weeks seedlings of 10 garden egg accessions were inoculated under screenhouse condition with 10 ml conidial suspension of a pure isolate of *Colletotrichum gleoeosporiodes* while 10 ml sterile distilled water was introduced into control treatment. Both inoculated and un- inoculated treatments were replicated 4 times. Disease incidence and severity per variety were scored at 3, 5 and 7 weeks after transplanting as described below where:

$$\text{Disease incidence} = \frac{\text{n} \times 100}{N}$$

Where n = Number of infected plants

N = Total number of plants per plot

Disease severity was rated on a scale of 0-5 as described in AVRDC protocols where:

- 0 = No symptoms;
- 1-3 = Mild infection and
- 4-5 = Severe infection

Screening of Garden egg lines for resistance to *Tuta absoluta*

This was carried out to validate the level of resistance of the improved varieties and two commercial varieties to *Tuta absoluta*. The experiment was conducted inside the entomology screen house of NIHORT, Ibadan so as to curtail the spread and achieve maximum infestation. The experiment was laid out in Completely Randomized Design (CRD) with each line having its control and replicated three times. Twenty pairs of adult *T. absoluta* were introduced into the cage for infestation. The seedlings were irrigated once a day till harvesting. *T. absoluta* damage was recorded from top, middle and bottom leaves of the egg plants and the percentage damaged was obtained. Data on the visual rating of Tuta damage on eggplant accessions from seedling to the fruiting stage was taken on leaves, stems and fruits. Based on the damage percentage, it was grouped into six damage rating scales *viz.,* 0 = 0 % of injury in the plant, 1 = small lesions, no coalescing, 0.1 to 5 % injury, 2 = small lesions, not coalescing, 5.1 to 20 % injury, 3 = medium and large lesions, from 20.1 to 50 % of injury, 4 = numerous lesions, large and coalescent, from 50.1 to 80 % of injury, 5 = plant completely deformed, more than 80.1 % of injury. The entomological data collected are: Number of mines/plant; Number of eggs laid/plant and Number of larvae/plant. Data on relative abundance of insect pests and damage were subjected to ANOVA using SPSS package version 16 and treatment means were separated with the Duncan's Multiple Range Test (DMRT).

2.1.3. Nutritive content

Fat extraction

Extraction procedures included weighing 100 mg (0.1 g) of the sample into a centrifuge bottle. 10 ml 1 ml n-hexane and 1 ml of 2 M KOH were added to the bottle and the mixture was shaken for 30 s on a vortex shaker and then centrifuged for 5 mins for uniformity. The top layer was decanted and used for subsequent analysis.

Fatty acid analysis

Fatty Acid Methyl Esters were analyzed using an Agilent 7890B Gas chromatograph equipped with a flame ionization detector (FID), fitted with a HP-5 capillary column coated with 5 % Phenyl Methyl Siloxane (30 m length x 0.32 mm diameter x 0.25 μm film thickness) (Agilent Technologies). 1μL of the samples were injected in split less mode at an injection temperature of 220 °C, at a pressure of 14.861 psi and a total flow of 21.364 mL/min. The purge flow to the split vent was set at 15 mL/min at 0.75 min. The oven was initially programmed at 100 °C (5 min) and then ramped at 7.5 °C/min to 225 °C (15 min). FID temperature was 300 °C with Hydrogen: Air flow at 30 mL/min: 300 mL/min, Nitrogen was used as makeup gas at a flow of 18 mL/min. After calibration, the samples were analyzed and corresponding concentrations were calculated. The labelled chromatograms were also extracted and reported [6].

Sensory profile analysis

A twelve-member trained panel of judges was constituted from academic and non-academic staff of the National Horticultural Research Institute, Ibadan. Panelists were regular consumers of garden egg. Each member was provided with questionnaires for subjective sensory evaluations. They were to describe the degree of like or dislike of the colour, appearance, texture, taste and overall acceptability of the vegetable fruit. A preliminary test which served as a training class was conducted a day before the main evaluation. The purpose was to make the members of the panel familiar with both the hedonic. Sample order was randomized among the judges to avoid position biases. Each panelist was provided with slices of bread and a cup of water to rinse his or her mouth before tasting the next sample to avoid carrying the residual taste of the previous sample using a hedonic scale:

- **Colour:** 1=whitish green, 2=deep green, 3=pinkish green, 4= yellowish green, 5=off colour
- **Appearance:** 1=highly glossy, 2= glossy, 3= slightly glossy, 4= slightly dull looking, 5=dull looking
- **Texture:** 1= slightly soft, 2= soft, 3=slightly hard, 4=hard, 5= very hard
- **Taste:** 1=sweet, 2= slightly sweet 3=bland, 4=slightly bitter, 5=bitter.
- **Shape:** 1= round, 2= slightly round, 3=neither round nor oblong, 4= slightly oblong, 5=oblong

- **Acceptability:**1=like extremely, 2=like moderately, 3=neither like nor dislike, 4=dislike,
- 5=dislike extremely.

3. Results and discussion

3.1. Agronomic and yield

There were significant variations among all the agronomic and yield-related characters measured at 5 % level of probability except for plant height, stem girth and days to flowering. The result of the mean performance revealed L03 as the best in yield and related characters, followed closely by L06 and L01; L07 was the shortest which guides the variety against lodging. YALO commercial variety was the earliest and it's a good material in future breeding programmes when earliness is the objective while L02 had the highest number of fruits per cluster and the highest number of fruits per plant. Therefore, L03, L06, L01, L07 and L02 were recommended for advancement to multi-locational and on-farm trials when other traits of interest from other disciplines have been considered (Table 1).

High yield and earliness are an important trait to be considered in any crop improvement programme. This study conforms with the work of [7] on "Generation mean analysis of F_5 progenies of brinjal (*Solanum melongena* L.) grown under Konkan agroclimatic condition. They reported significant variations in various growth parameters viz: plant height, number of secondary branches per plant, number of leaves per plant and plant spread, all flowering characters, yield and yield-related characters. There was non-significant variation for primary branches per plant. According to their report, Genotype T28 recorded the maximum number of fruits (30.6) per plant while overall yield per plant (1.99 kg) and yield/ha (55.26 t) was highest in genotype T5. They selected 19 promising lines with good growth habit, yield and yield-related characters for further studies.

Table 1 Mean performance of some characters in seven improved varieties of garden egg and two commercial checks observed during the cropping season of the year 2021

Gen	Pht (cm)	Nbrplant	Stmgth (mm)	Dsfl	Dsfr	Nfcl	Ufwt (kg)	Nfrtplant	Fwtplant (kg)	Yield (t/ha)
L01	72.11a	18.75ab	4.04a	81a	86.33abc	1.58ab	0.05bc	43.61ab	1.62ab	42.93ab
L02	84.61a	19.67ab	4.08a	78.67a	84.0b	2.08a	0.02d	86.3a	1.61ab	42.93ab
L03	86.81a	28.69a	4.54a	81a	90.0a	1.78a	0.04cd	78.0a	2.62a	69.78a
L05	70.96a	14.42ab	3.55a	80.33a	88.0ab	1.83a	0.06b	41.42ab	1.43ab	38.04ab
L06	73.3a	23.13ab	4.03a	82a	89.5a	1.63ab	0.05bc	77.83a	2.49a	66.4a
L07	63.26a	13.36b	3.46a	81.33a	88.67ab	1.92a	0.05bc	42.94ab	1.42ab	37.78ab
L08	72.82a	16.67ab	3.53a	80.33a	90.67a	1.58ab	0.05bc	42.19ab	1.49ab	39.82ab
YALO	67.72a	11.58b	4.28a	77a	81.67c	1.25b	0.14a	7.58b	0.99b	26.58b
NHS10-71	71.93a	8.50b	3.83a	78.67a	88.33ab	1.17b	0.04bcd	21.42b	0.66b	17.69b

Means with the same alphabet are not significantly different from one another along the column.

Gen. = genotype code; Pht(cm) = plant height at 18 weeks after transplanting; Nbrplant = number of branches per plant; Stmgth = stem girth; Dsfl = number of days to flowering; Dsfr = number of days to first fruit set; Nfcl = number of fruits per cluster; Ufwt = unit fruit weight; Nfrtplant = number of fruits per plant; Fwtplant = Fruit weight per plant and Yield(t/ha) = fruit yield in tons per hectare (ha)

3.2. Reaction to anthracnose

Significant differences ($P<0.05$) were recorded in all the genotypes under study in relation to disease incidence and severity against anthracnose (Table 2). Seven genotypes of Garden egg (L01, L02, L03, L05, L06, L07, L08) were tolerant to anthracnose under artificial inoculation while the highest disease incidence (66.7 %) was recorded in YALO and mild infection (33.3 %) was observed in NHS10-71 (Table 2). Anthracnose has been reported as one of the major pests of eggplants which is usually controlled using chemicals. Due to the adverse effect of chemicals on human health and the environment, resistant or tolerant varieties must be developed to combat the problem to increase yield and profit for farmers and to avoid hazards to human health. The anthracnose tolerance observed in the seven candidate varieties of the garden egg agrees with the work of [8] who worked on 'Screening of Eggplant genotypes for resistance to anthracnose. From his findings, anthracnose disease resistance was observed on Anthropo, Kalenda F1 and Zebrina genotypes of eggplant while other genotypes varied significantly in their level of susceptibility. Both field and laboratory experiments showed similar results for disease resistance and susceptibility among the genotypes.

Table 2 Tolerance and susceptibility of Garden egg to anthracnose under artificial inoculation in the screenhouse

Genotype	Incidence	Severity	Ranking
L01	0.00[b]	0.00[b]	1
L02	0.00[b]	0.00[b]	1
L03	0.00[b]	0.00[b]	1
L05	0.00[b]	0.00[b]	1
L06	0.00[b]	0.00[b]	1
L07	0.00[b]	0.00[b]	1
L08	0.00[b]	0.00[b]	1
YALO	66.67[a]	2.00[b]	3
NHS10-71	33.33[ab]	0.67[ab]	2

Means with the same alphabet are not significantly different from one another along the column.

3.3. Reaction to *Tuta absoluta*

Table 3 Mean numbers of eggs, larvae and mines of *Tuta absoluta* on Garden egg accessions under screen-house condition

Accessions no	Number of eggs	Number of larvae	Number of mines
L01	8.47 a	5.12 c	6.35 d
L02	8.45 a	4.22 d	7.82 c
L03	8.41 a	5.78 b	9.33 a
L05	4.95 c	4.10 d	7.33 c
L06	8.88 a	3.94 d	8.54 b
L07	8.53 a	5.70 b	4.11 f
L08	6.14 b	3.86 d	5.14 e
YALO	8.38 a	5.02 c	5.10 e
NHS10-71	8.48 a	6.87 a	6.16 d

Means with the same alphabet are not significantly different from one another along the column.

The results from the reactions to *Tuta absoluta* showed that there were significant differences ($P<0.05$) between the number of eggs laid by *Tuta absoluta* larvae and mines formed by these larvae on garden egg in the restricted area. The mean numbers of eggs, larvae and mines of *Tuta absoluta* on garden egg plants under screenhouse condition are presented in Table 3. From the table, it was observed that the pest's most preferred genotype to lay their eggs was L06 (8.88) as against the other eight genotypes. The number of eggs that hatched into larvae also significantly differ from one another with genotype NHS10-17, one of the commercial varieties recording the highest number of larvae hatched (3.06). The mining activities of the larvae were more pronounced in genotype L03 (9.33) and the least was on genotype L07 (4.11). However, the genotypes can compensate for damages caused by *Tuta absoluta* and it was discovered that all the African eggplant genotypes recovered from damages resulting from *Tuta absoluta* and produced significant flowers and fruits. Therefore, genotypes L07, L08 and L01 are recommended for multi-locational and on-farm trials while YALO and NHS10-71 are good parental materials in future breeding work when resistance to diseases is one of the objectives.

This study is in conformity with the report of [9] who worked on 'Evaluation of tomato cultivars for resistance to *Tuta absoluta* (Lepidoptera: Gelechiidae). According to his report, only view larvae of *Tuta absoluta* were able to complete their life cycle on wild accession LA 1777 while none was able to complete their life cycle on PI 134417 and the Cross. Mphahlele concluded that, the morphological characteristics recorded from the resistance of the wild accession and the Cross were achievable likely due to the presence of glandula trichome type 4 which was absent in the cultivated genotypes used in his experiment.

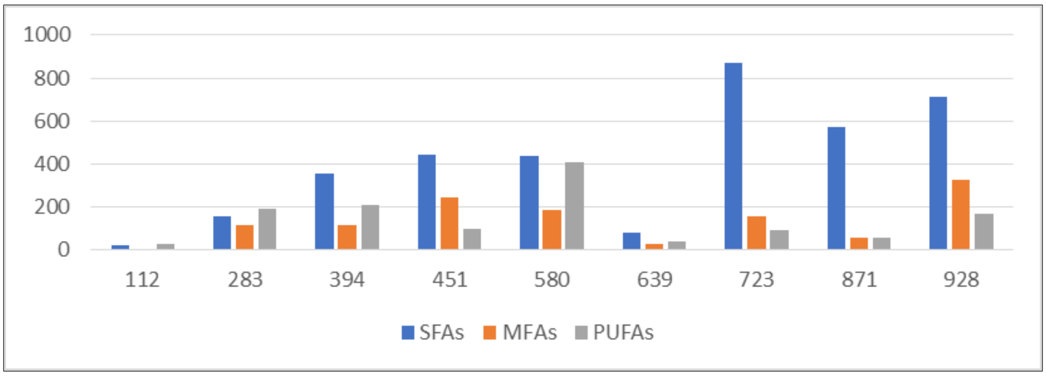
3.4. Fatty acid composition

There has been increased awareness of the role of essential fatty acids in human health and disease prevention in recent times. The term essential fatty acids (EFA) refers to those polyunsaturated fatty acids (PUFA) that must be provided by foods because these cannot be synthesized in the body yet are necessary for health. The fat type in food is more important than the amount of dietary consumed cholesterol. The results of many studies have confirmed that saturated fatty acids and trans fatty acids have negative effects on human health, whereas polyunsaturated fatty acids have a positive effect on human health as regards coronary heart diseases [6]. Thus, YALO can be considered as containing the most favourable fat composition considering its moderate total fat content and high levels of PUFAs, followed closely by L06 and L08 with moderate SFAs and high PUFAs (Table 4 / Figure 1). Many studies have positively correlated essential fatty acids with the reduction of cardiovascular morbidity and mortality, infant development, cancer prevention, optimal brain and vision functioning, arthritis, hypertension, diabetes mellitus and neurological/neuropsychiatric disorders [10]. Beneficial effects may be mediated through several different mechanisms, including alteration in cell membrane composition, gene expression or eicosanoid production.

Table 4 Fatty acid composition of different genotypes of Garden egg

	NHS10-71	YALO	L08	L07	L06	L05	L03	L02	L01
Fatty acid (μg/g)	Saturated Fatty Acids (SFAs)								
Decanoic acid (C10:0)	-	44.3	92.6	73.31	101.59	11.42	210.20	142.68	14.32
Dodecanoic acid (C12:0)	-	-	15.67	46.60	54.73	-	-	8.65	9.96
Myristic acid (C14:0)	-	-	68.80	62.93	74.93	10.54	175.48	121.74	116.59
Pentadecanoic acid (C15:0)	-	-	-	-	-	-	-	-	6.51
Palmitic acid (C16:0)	-	19.54	16.33	17.18	18.22	9.08	19.60	5.05	5.73
Heptadecanoic acid (C17:0)	6.42	67.27	136.25	130.94	156.46	20.99	299.75	218.93	283.56
Stearic acid (C18:0)	2.10	6.41	9.81	93.52	11.07	10.92	165.22	73.53	252.87
Arachidic acid (C20:0)	10.80	17.40	15.88	16.41	16.9	15.89	-	-	21.62
Total SFAs	19.32	154.92	355.34	440.89	433.9	78.84	870.25	570.58	711.16
Monounsaturated fatty acids (MUFAs)									
Myristoleic acid (C14:1)	-	38.07	5.0	12.07	8.80	-	5.70	8.39	7.87
Palmitoliec acid (C16:1)	-	8.19	15.72	25.94	33.95	-	31.96	20.15	34.54
Oleic acid (C18:1)	-	66.32	95.13	203.13	142.54	23.48	118.02	28.19	283.24
Total MUFAs	0	112.58	115.85	241.14	185.29	23.48	155.68	56.73	325.65
Polyunsaturated fatty acids (PUFAs)									
Linoleic (C18:2)	-	-	-	7.05	5.79	-	3.12	-	11.38
γ- Linolenic acid (C18:3)	-	140.36	-	-	311.17	-	-	-	16.80
Eicosadienic (C20:2)	18.37	28.88	23.81	39.67	36.12	28.41	-	-	30.27
Eicosatienic (C20:3	-	-	-	-	-	-	-	-	27.26

Arachidonic acid (C20:4)	5.85	6.75	154.74	11.72	5.85	5.15	46.60	29.52	30.26
Eicosapentanoic acid (C20:5)	2.24	12.67	27.60	38.39	48.46	6.32	38.37	28.89	48.89
Total PUFAs	26.46	188.66	206.15	96.83	407.39	39.88	88.09	58.41	164.86



Y-axis: Fatty acid composition (µg/g); X-axis: Genotypes; Keys: 112=L01; 283=YALO; 394=L08; 451=L07; 580=L06; 639=L05; 723=L03; 871=L02 and 928=L01

Figure 1 Fatty acid Composition (µg/g) of different genotypes of Garden egg by categories

3.5. Sensory profile

L02 is the most preferred (1.5) in terms of overall acceptability (Table 5). It also scored highest in appearance and taste. However, it scored low in terms of shape. This is followed by L06 and L01 having an overall acceptability of 1.67 and 1.75 respectively. L06 came second for its colour (1.5), taste (2.25) and third for its shape (1.92) while L01 came first in shape (1.42) and at pale with YALO (1.42), it came second in colour (1.67), and appearance (2.25) (Table 5). The results of the correlation test showed that colour, appearance and taste were significantly associated with overall acceptability which shows that these are the important attributes that consumers may focus on more.

Table 5 Sensory scores of Garden egg genotypes as assessed by trained panelists

S/No	Cultivar	Colour	Appearance	Texture	Taste	Shape	Overall
1	L01	1.67	2.25	3.42	3.67	1.42	1.75
2	L02	2.17	2	2.92	1.67	3.42	1.5
3	L03	2.5	3.42	3.42	4.67	1.83	3.42
4	L05	1.25	3	3.08	3	3.33	2.18
5	L06	1.5	2.92	3.33	2.25	1.92	1.67
6	L07	1.5	2.25	3.08	3	2.25	2.08
7	L08	1.83	2.58	2.83	2.42	4.25	1.92
8	YALO	2.17	2.92	3.58	2.75	1.42	2.33
9	NHS-10-71	2.25	2.58	2.58	2.83	4.25	1.83

4. Conclusion

The outcome of the experiment showed that L03 had the highest yield and yield-related characters but it was the variety with the highest saturated fatty acid which is hazardous to human health and it was the least acceptable in overall acceptability. L06 and L01 are the next in yield and are of moderate SFAs and appreciable MUFAs and PUFAs which are beneficial to human health. All the seven improved varieties were tolerant to Anthracnose while YALO was the most susceptible to anthracnose. The mining activities of *Tuta absoluta* were more pronounced in L03 while the least was observed in L07. L02 was the best in overall acceptability during sensory evaluation but had very high SFAs. L06 was second best in overall acceptability while L01 was third. Based on the overall assessment of the disciplines involved in the experiments with regards to high yielding, resistance to pests and diseases and beneficial fatty acids composition, it can be concluded that there is an improvement of the seven candidate varieties over the existing two local checks (YALO and NHS10-71). Therefore, L06, L08 and L01 were selected for multi-locational and on-farm trials and future release.

Recommendation

L02 and L03 can be improved in future breeding programmes through backcrossing for improvement on their fatty acids composition and acceptability respectively.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Eze, S.C., Baiyeri, K.P., Agbo, C.U., Ameh, G.I. and Osahele, E.S.Sensory Evaluation of eggplant fruits as a selection tool for eggplant breeding Academic Journals. 2012; 7(37), 524 - 525. http://www.academicjournals.org/AJAR

[2] Onunka, B.N, Chinaka, C.C. and Ezeh, C.I. Socio- Economic Determinants of African Eggplant (Solanum gilo) Marketer in Abia State, Nigeria. Journal of Agriculture and Social Research. 2011; 11(2), 147-154. Available online at https://www.ajol.info/index.php/jasr/article/view/78639

[3] Horna, D., Timpo, S. and Gruere, G. Marketing underutilized crops: The case of the African garden egg (Solanum aethiopicum) in Ghana. Global Facilitation Unit for Underutilized Species (GFU) Via dei Tre Denri, Rome, Italy. 2007 https://www.bioversityinternational.org/fileadmin/_migrated/uploads/tx_news/Marketing_underutilized_crops__the_case_of_the_African_garden_egg__Solanum_ethiopicum__in_Ghana_1267.pdf

[4] Bationo-Kando, P., Sawadogo, B., Nanema, K. R., Kiébré, Z., Sawadogo, N., Kiébré, M., Traoré, R.E., Sawadogo, M. and Zongo J.D. Characterization of Solanum aethiopicum (Kumba group) in Burkina Faso.J. Plant Breed. Genet.2015; 06 (02):pp39-45

[5] Okafor H.K., Odugbemi A.I., Okezie C.B.,and Achebe M.K. Antidiabetic and hypolipidaemic effects of Garden egg (Solanum aethiopicum) leaf extract in beta-cells of Streptozotocin induced diabetic male Wistar rats. Annu. Res. and Rev. in Biol. 2016; 10(6): 1-11. www.sciencedomain.org

[6] Budge, S.M., Iverson, S.J., & Koopman, H.N. Studying trophic ecology in marine ecosystems using fatty acids: A primer on analysis and interpretation. Marine Mammal Science, 2006; 22:759–801. Doi: 10.1111/j.1748-7692.2006.00079.x

[7] Haldavanekar T.P., Parulekar Y.R., Pawar A.P., Haldavanekar P.C. and Mali P.C. Generation mean analysis of F5 progenies of brinjal (Solanum melongena L.) grown under Konkan agroclimatic condition. Journal of Pharmacognosy and Phytochemistry. 2019; 8(3): 3261-3269, www.phytojournal.com

[8] Yeboah A. Screening of Eggplant for resistance to Anthracnose. Thesis dissertation (Ph.D. Thesis), Department of Crop and Soil sciences, Faculty of Agriculture Krust, Kumasi, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. 2014

[9] Mphahlele R.B.Evaluation of tomato cultivars for resistance to *Tuta absoluta* (Lepidoptera: Gelechiidae). Thesis dissertation (M.Sc. Thesis) North-West University, South Africa. 2021.ID-orcid.org/0000-0002-4822-0673

[10] Adeyeye A., Salami Adeniyi A.I., Sulaiman W.K. and Akinyode O.A. Proximate composition and fatty acid profile of garden egg (Solanum aetiopicum) fruit. Journal of Food Science and Nutrition. 2020; 5(2):pp9-13; www.foodsciencejournal.com