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FRUIT MATURITY & AFTER-RIPENING IMPROVE SEED PHYSICAL AND PHYSIOLOGICAL QUALITY OF *SOLANUM AETHIOPICUM* L.

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ABSTRACT

In the absence of a reliable seed supply for the African eggplant (*Solanum aethiopicum* L.), farmers source their seeds from fruits harvested for fresh market (precocious harvests) but ripen later in the market. Some also source seeds from traders who extract seeds from unsold fruits. Fruits harvested at 20 days after anthesis (DAA) failed to germinate while those extracted from 34 DAA fruits had less than 10% germination in a preliminary study. This study was, therefore, conducted to determine whether the seeds within fruits harvested at 30 days after anthesis upwards could be after-ripened prior to seed extraction to improve seed physical and physiological quality characteristics. The treatments were laid in a randomized complete block design in a 2 x 5 x 4 factorial arrangement involving two cultivars, five harvest maturity stages: 30, 40, 50, 60 and 70 days after anthesis, four after-ripening periods: 0, 5, 10 and 15 days with four replications. Fruits were harvested at different maturity stages & seeds were extracted at 0, 5, 10 and 15 days of storage under ambient condition (24 ± 3 °C) after each harvest. Seed dry weight, seed moisture content, 1000 seed weight, first germination count and germination percentage were determined. It was established that precocious harvest (30 days after anthesis, DAA) was not beneficial to physiological seed quality even when subjected to 15 days after-ripening. Fruits harvested 40 DAA failed to germinate while 50 DAA fruits had not more than 50% germination in both cultivars. However, when seeds extracted from these fruits were ripened for 15 days in storage, the germination percentage increased significantly by 63 to 72%. Seeds extracted from fruits harvested 60 or 70 DAA achieved the maximum germination, varying between 93 to 94% (*cv. Oforiwa*) & 78 to 96% (cv. *Kpando*) independent of after-ripening treatment. It is concluded that after-ripening is inconsequential & not necessary when seeds are harvested at physiological maturity (60 -70 DAA). For the purpose of seed production, it is recommended to harvest seeds of African eggplant at physiological maturity.

Keywords: After-ripening, post-storage, seed maturity, germination, physiological quality, *Solanum aethiopicum*.

Introduction

The ideal fruit development stage to harvest fruits to obtain high quality seeds is very critical for seed production purposes. Several studies have been conducted to establish the ideal maturity stage for harvesting many fruits whose seeds are borne in berries such as tomato (Demir & Ellis, 1992, Demir & Samit, 2001; Dias *et al*., 2006), pepper (Vidigal *et al.,* 2009; 2011), eggplant (Demir *et al*., 2002) and

Okra (Bortey & Dzomeku, 2016). A recent study by Botey *et al.* (2021) reported that African eggplant (*Solanum aethiopicum* L.) seeds extracted from 30 days after anthesis fruits failed to germinate or had less than 10% germination. Furthermore, it has been observed that most crop species whose seeds are borne in fleshy berries such as the African eggplant are known to continue to mature after it has been detached from the mother plant.

This means the seeds within the harvested fruit may continue to develop and mature (Passam & Karapanos, 2008). This is probably so because some of the seeds harvested may be less mature and result in dormancy due to the insufficiently developed embryo (Demir *et al*., 2002). However, after-ripening or post-harvest fruit storage is a technique which has been reported to enhance seed quality and release partial dormancy in such fruits (Yogeesha *et al*., 2006; Iglesias-Fernandes *et al*., 2010; Passam et al., 2010). This technique has been reported to enhance germination in pepper, eggplant, cucumber, tomato (Edwards & Sundstrom, 1987, Alvarenga *et al.,* 1991; Sanchez *et al.,* 1993; Dias *et al.,* 2006; Passam *et al*., 2010).

When fruits were harvested at 25 days after anthesis (DAA) and stored at 25°C for 20 days prior to seed extraction, the mean 1000 seed weight was significantly higher than seeds from fruits harvested on the same day but extracted without after-ripening (Passam *et al*., 2010). The authors further indicated that after-ripening increased the rate of germination of seeds from fruit harvested 45–65 DAA and concluded that storage of prematurely harvested fruit prior to seed extraction permits the seeds of these fruits to after-ripen *in situ* and thereby, increases seed size and germination (Passam *et al.,* 2010). Earlier, Dias *et al.* (2006) found that allowing a short period of post-harvest fruit storage of tomato improves physiological seed quality. Similarly, Kortse and Oladiran (2013) observed that after-ripening durations significantly influence 100 seed weight and germination percentage of melon (*Citrullus lanatus* (Thumb) seeds. Shaheb *et al*. (2015) also found the highest germination of French bean seeds to be obtained from lately harvested pods than those harvested and extracted earlier. Eggplant (*Solanum melongena* L.), a close relative of African eggplant (*Solanum aethiopicum* L.) had a positive response in relation to fresh and dry seed weights, 100-seed weights and germination percentage when subjected to five to ten days after-ripening (Kortse, *et al*., 2017). Ozden and Demir (2018) in studying Aubergine (*Solanum melongena* L.) also revealed that after-ripening significantly increase total germination and concluded that aubergine (*Solanum melongena* L.) seed germination can be increased through after-ripening treatment. There is however, little information reported regarding this phenomenon in African eggplant (*Solanum aethiopicum* L.*)*, particularly the Gilo group popularly grown and consumed in West Africa. Fruits at various stages after anthesis were harvested & tested to ascertain whether the seeds within these fruits could be after-ripened before extraction and establish if fruits can be harvested at an earlier stage than at full ripeness for maximum seed quality.

Experimental

Study location

The field experiment was conducted at University of Eldoret (UoE) Agriculture Research Field, Eldoret, Kenya between July, 2019 and February, 2020 located in Uasin Gishu County (N00° 34.468′ E 035° 18.044′). All seed physical and physiological quality studies were carried out at the Seed Physiology Laboratory of the Department of Seed, Crop and Horticultural Sciences, UoE, Kenya.

Source of Seeds
Seeds of African eggplant (*Solanum aethiopicum* L.) cv. *Oforiwa* (round-shaped fruit) and cv. *Kpando* (Elongated to Blocky-shaped fruit), were obtained from CSIR-Crops Research Institute, Kumasi, Ghana.

Experimental design
The treatments were laid in a randomized complete block design in a 2 x 5 x 4 factorial arrangement involving two cultivars, five harvest maturity stages: 30, 40, 50, 60 and 70 days after anthesis, four after-ripening periods: 0, 5, 10 and 15 days with four replications.

Nursery and field activities
Seeds were sown in a seed germination tray (54 cm x 28 cm x 4.3 cm) containing a mixture of top soil and cocopeat at a ratio of 1:1 at the nursery. One seed was sown per cell at a depth of approximately 3 mm. Seedlings were transplanted 6 weeks after sowing (with a minimum of three true leaves) to an open field at a spacing of 75 cm intra-row and 60 cm inter-row. There were eight (8) plants per row with six (6) rows per plot constituting a total of 48 plants per plot. Flowers were tagged at anthesis and fruits were harvested 30, 40, 50, 60 or 70 days after anthesis (DAA).

After-ripening treatment and Seed extraction procedure
After each harvest, fruits were randomly grouped into four (4). Each sub-group constituted an after-ripening treatment. Seed were extracted immediately (0 day) or after-ripened (stored) for 5, 10 or 15 days under room conditions (24 ± 3 °C and 70 - 75% relative humidity). A knife was used to cut open the fruits longitudinally and seeds were extracted manually under running water into a basin. Seeds were thoroughly rinsed before data collection. Seed extraction was carried out at the end of each storage period.

Data collected
Fresh and Dry seed weight (g): Hundred seeds of freshly extracted seeds in five replicates were counted and weighed to determine fresh seed weight (mg). The fresh seeds were then dried at 103 ±3 °C in a table top oven (UF30plus Memmert) for 24 hours. The weight of the dried seeds were then recorded to determine the dry seed weight (mg).

Seed moisture content (%): The seed moisture content was determined by the oven-drying method. Sub-sample of the freshly harvested seeds was used to determine the seed moisture content. One (1) gram of seeds in 2 replicates were weighed (1 g x 2 replicates) and dried at low constant temperature of 103 ±3 °C for 17± 1 hours. The percentage seed moisture content was calculated according to International Seed Testing Association (ISTA, 2011) Rules.

Thousand seed weight (g): Considering that the weight of one thousand seeds of a sample varies according to the seed moisture content. Thousand seeds were determined using the seeds dried at 103 ±3 °C for 24 hours (100 seed weight) & multiplied by 10 & expressed as the mean weight per 1000 seeds in grams.

First germination count and germination percentage (%): All seeds used for first germination count & percentage seed germination were dried under ambient conditions until it has attained a seed moisture content of 10 – 11% on fresh wet basis. Seeds were subjected to germination tests by placing 50 seeds in four replicates on a moistened blotter (Whatman) paper in 90 mm petri dishes. The paper was moistened with distilled water & the closed petri dishes were incubated at 30/20°C under alternating 16/8 hours of light/dark for 14 days according to Botey *et al*. (2022). Germination was recorded daily and the germinated seeds were discarded. The

criterion for germination was the appearance of the radicle with a length > 2 mm. Results were presented as first count (which was the number of seeds germinated on the 7th day over the total number of seeds sowed as a percentage) and total percent germination according to International Seed Testing Association (ISTA, 2011) Rules.

Data analysis

Data on mean germination time (MGT) and time to reach 50% germination (T_{50}) were analysed on three harvest maturity stages against the four after-ripening treatments (only germinated seed lots can be used to calculate both MGT and T_{50}). Shapiro-Wilk's test for normality was employed in checking for normality of all data variables. Variables that did not follow normal distribution were arcsine transformed before subjecting to analysis. Normally distributed data were subjected to analysis of variance (ANOVA). All ANOVA assumptions were checked and means were compared using Turkey's HSD test at a significant level of 5%. IBM SPSS Statistical package version 22 was used to analyse the data.

Results and discussion

The results showed that independent and interactive effects of fruit maturity stage, after-ripening treatment and cultivar significantly ($p < 0.0001$) influenced the seed physical traits such as seed dry weight, thousand seed weight and seed moisture content. Figure 1 illustrates the effect of After-ripening on seed moisture content at different fruit harvesting time for cv. *Oforiwa* and cv. *Kpao.* The analysis showed a highly significant ($p < 0.001$) independent & interactive effect on seed moisture content as influenced by time of harvest and after-ripening.

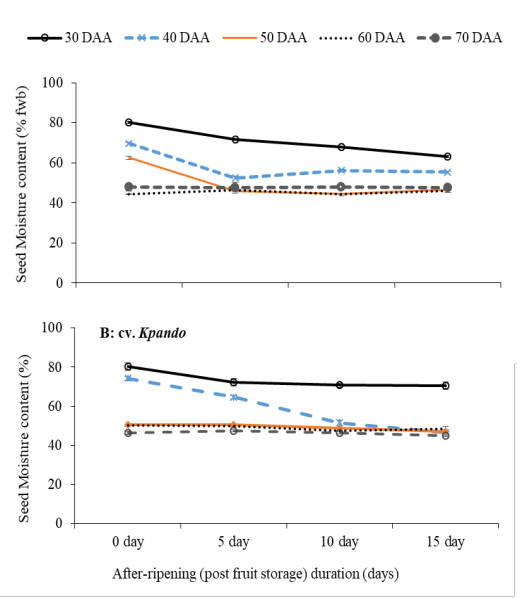

Fig. 1: Seed moisture content for African eggplant, cv. *Oforiwa* and cv. *Kpao* fruits harvested at 30, 40, 50, 60 & 70 DAA and stored for 0, 5, 10 and 15 days. Error bars represent standard deviation.

The seed moisture content was high (79.2 - 80 %) at early fruit harvests and declined linearly with maturation (Fig. 1) for both cultivars. The effect of after-ripening was significant in earlier harvests (30 -50 DAA) than in later harvests (60 or 70 DAA). The maximum moisture content, varying between 80 to 63.1% (after 15 days storage) was found in seeds from fruits harvested 30 DAA, followed by fruits harvested 40 DAA (69.7 to 55.3%) (Figure 1).

This moisture content trend is consistent with an observation in peppers (Vidigal *et al.,* 2009) where maximum seed moisture varied between 63.2 to 58.6% (15 days storage) in seeds from 40 DAA fruits. The seed moisture content decreasing pattern was as a function of maturation (80 to 47%) from 30 DAA to 70 DAA, than the after-ripening (storage) treatment. This depicts a typical pattern of

orthodox seeds borne in fleshy fruits. The gradual decline in moisture is as a result of dry matter accumulation as depicted in Table 1. The relatively higher seed moisture contents observed at physiological maturity stages (70 DAA) is consistent with vegetable seeds (Vidigal *et al.,* 2009; Demir *et al*., 2002).

Practically, the storage of fruits harvested at 60 or 70 DAA did not affect the seed moisture content which varied between 46.6 and 44.3% (60 DAA) and between 47 & 47.6% (70 DAA). This observation is consistent in pepper (Vidigal *et al*., 2009). It is generally reported that the moisture content of seeds borne in fleshy fruits have high moisture contents, oscillating between 38 and 45% at maturity and remains high even after accumulation of the maximum dry matter. This corroborates with earlier studies by Demir & Ellis, (1992a; Alan & Eser, 2008; Vidigal *et al*., 2011) for pepper, Dias *et al*. (2006) for tomato, Demir *et al.* (2002) for eggplant and recently for wood apple (Murrinie *et al.,* 2019). The present study confirms this observation for African eggplant.

TABLE 1

Effect of after-ripening for 5, 10 and 15 days on dry seed weight (mg) of cv. Oforiwa and cv. Kpando extracted from fruits harvested 30 -70 days after anthesis.

	After-ripening period (days)							
	Dry Seed Weight (mg) *cv. Oforiwa*				**Dry Seed Weight (mg) *cv. Kpando***			
Harvest time	**0**	**5**	**10**	**15**	**0**	**5**	**10**	**15**
30 DAA	105.5 e	112.0 e	123.5 d	133.0 e	102.2 d	146.1 d	145.5 e	140.0 d
40 DAA	163.2 d	180.0 d	185.7 c	214.0 d	133.5 c	172.5 c	265.5 c	271.0 b
50 DAA	214.0 c	234.2 b	244.2 a	243.0 b	258.0 b	254.0 b	296.7 a	296.0 a
60 DAA	281.7 a	224.7 c	234.5 b	254.0 a	260.0 b	273.5 a	289.5 b	257.0 c
70 DAA	241.2 b	240.0 a	237.0 b	223.2 c	272.0 a	273.5 a	251.0 d	257.0 c

Means with the same letter within a column are not significantly different according to Tukey's at 5% level of significance.

TABLE 2

Effect of after-ripening for 5, 10 and 15 days on thousand seed weight (g) of cv. Oforiwa and cv. Kpando extracted from fruits harvested 30 -70 days after anthesis.

	1000 Seed Weight (g) *cv. Oforiwa*				**1000 Seed Weight (g) *cv. Kpando***			
Harvest time	**0**	**5**	**10**	**15**	**0**	**5**	**10**	**15**
30 DAA	1.08 e	1.11 e	1.23 d	1.33 e	1.02 d	1.45 d	1.48 e	1.41 d
40 DAA	1.63 d	1.79 d	1.83 c	2.16 d	1.33 c	1.69 c	2.67 c	2.70 b
50 DAA	2.14 c	2.32 b	2.46 a	2.41 b	2.57 b	2.55 b	3.06 a	3.05 a
60 DAA	2.83 a	2.26 c	2.41 ab	2.57 a	2.60 b	2.73 a	2.90 b	2.57 c
70 DAA	2.47 b	2.40 a	2.37 b	2.28 c	2.70 a	2.73 a	2.50 d	2.53 c

Means with the same letter within a column are not significantly different according to Tukey's at 5% level of significance.

TABLE 3

Interactive effect of maturity and after-ripening for 5, 10 and 15 days on first germination count and percent germination of seeds of cv. Oforiwa and cv. Kp&o extracted from fruits harvested 30 -70 days after anthesis.

	After-ripening period (days) *cv. Oforiwa*								After-ripening period (days) *cv. Kpando*							
	First germination Count (%)				Germination (%)				First germination Count (%)				Germination (%)			
Harvest time	0	5	10	15	0	5	10	15	0	5	10	15	0	5	10	15
30 DAA	0 d	0 d	0 d	7 d	0 c	0 e	6 d	46 c	0 d	0 d	0 d	0 d	0 d	0 d	0 d	0 d
40 DAA	0 d	6 cd	10 c	27 c	0 c	13 d	63 c	67 b	0 d	5 d	7 c	42 c	0 d	9 c	68 c	92 bc
50 DAA	11 c	9 c	34 b	36 b	54 b	67 c	77 b	93 a	8 c	11 c	29 b	53 b	43 c	32 b	78 b	91 c
60 DAA	28 b	38 b	62 a	79 a	93 a	88 b	94 a	95 a	37 b	60 b	75 a	87 a	78 b	92 a	94 a	98 ab
70 DAA	61 a	59 a	68 a	76 a	94 a	95 a	97 a	95 a	88 a	85 a	78 a	92 a	96 a	96 a	95 a	99 a

Means with the same letter within a column are not significantly different according to Tukey's at 5% level of significance

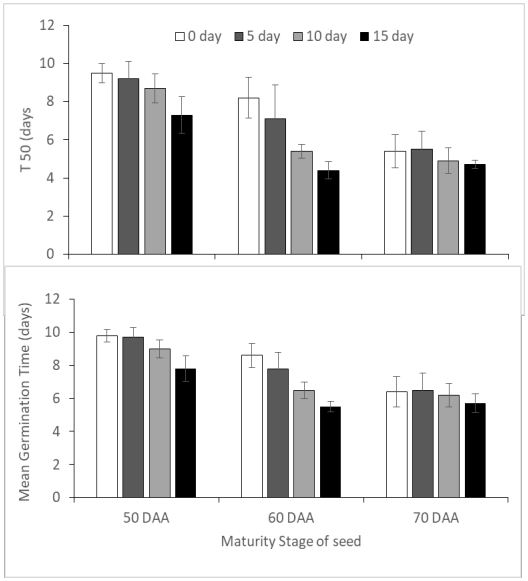

Fig. 2: Mean values of the interactive effect of fruit harvest time and after-ripening on time to reach 50% germination (T_{50}) and mean germination time (MGT). Error bars represent standard deviation.

The results showed a highly significant ($p < 0.001$) independent and interactive effect of time of fruit harvest and after-ripening of African eggplant on both first germination count, final germination and mean germination time (MGT) & time to reach 50% seed germination (T_{50})of both cultivars.

The dry seed weight (mg) increased gradually as fruits mature and peaked at 60 days after anthesis (DAA) with a slight decline afterwards in cv. *Oforiwa* (Table 1). On the contrary, the maximum dry seed weight (272 mg) of 100 seeds was observed at 70 DAA in cv. *Kpando* (Table 2) without after-ripening treatment. The influence of after-ripening of fruits on dry seed weight was highly significant in earlier harvests (30 – 50 DAA) than in latter harvests (60 -70 DAA). After 15 days of after-ripening, dry matter content of seeds from fruits harvested earlier (30 -50 DAA) significantly increased in both cultivars while seeds from fruits harvested at 60 or 70 DAA remained unchanged or decreased marginally.

The observed increase of seed dry matter during after-ripening is due to nutrient transfer from the fruits to the seeds (Alvarenga et al., 1994; Barbedo *et al.,* 1994). The significant effect observed in fruits harvested earlier, however, suggests that the interval between anthesis and fruit harvests plays a critical role. It can thus be suggested that the greater the

interval between anthesis to harvest, the less influence after-ripen or post-harvest storage has on seed dry matter content. Alvarenga *et al*. (1991) observed a two fold increase in dry matter content of squash seeds when harvested at 25 DAA and stored for 3 days prior to extraction but decreased when fruits were harvested later at 55 DAA.

On the other hand, the observed decreased or no change in seed dry weight for fruits harvested at 60 or 70 DAA, is due to the fact that the seeds at this stage had already attained physiological maturity, with a completion of the seed filling, which explains a somewhat stabilized dry matter content of seeds (Demir *et al*., 2002). Further, the observed decline after-ripen for 15 days could be attributed to the fact that seeds borne in fleshy fruits at harvest still possess high moisture content, therefore, as they continue to respire by consuming the accumulated reserves the seed dry matter content are likely to reduce (Carvalho & Nakagawa, 2000). The present observation corroborates with Vidigal *et al*. (2009) for pepper, Alan & Eser (2008) for hot and iconic peppers where post-harvest storage or after-ripening decreased the seed dry weight. Dias *et al.* (2006) also reported a slight decline in seed dry matter content during post-storage for tomato.

Similarly, the maximum mean 1000 seed weight was 2.83 and 2.72 g when seeds were extracted from fruits harvested at 60 DAA & 70 DAA for *cv. Oforiwa* and *cv. Kpando* respectively without after-ripening (Table 2). The observed difference could be due to cultivar as seed size of cv. *Kpando* were slightly bigger than cv. *Oforiwa* (Botey *et al.,* 2021). However, when fruits were stored for 10 - 15 days prior to seed extraction, mean 1000 seed weight increased significantly at earlier harvests (30 -50 DAA) than latter harvests (60 - 70 DAA) by which stage seed filling was apparently complete (Demir *et al.,* 2002). Maximum increase in mean 1000 seed weight after-ripening occurred at 50 - 60 DAA in both cultivars when stored for 10 – 15 days under ambient conditions and remained unchanged or declined marginally. Similar observations were made by Passam *et al*. (2010) in eggplants when mean 1000 seed weight occurred at 55 DAAA and declined or remained after-ripening of fruits. The present study is consistent with earlier reports by Kortse and Oladiran (2013) who observed that after-ripening durations significantly influence 100 seed weight melon (*Citrullus lanatus* (Thumb) seeds.

The data of the first germination count of germination revealed no or low germination (0 or < 10 %) when fruits were harvested earlier (30 DAA) independent of after-ripening treatment (Table 3). Fruits harvested from the mother plant at 30 – 40 DAA recorded no first count germination or had low seed vigour (< 10%). However, when subjected to after-ripening period of 15 days under ambient condition, fruits harvested at 40 or 50 DAA had a significant increase in germination of first count 27 - 36% and 42 - 53% in *cv. Oforiwa* and *cv. Kpao,* respectively. The maximum germination at first count occurred in fruits harvested 70 DAA without post-storage (61 - 88%) in both cultivars which was not significantly different when fruits were harvested 10 days earlier and after-ripen for 15 days (79 – 87%). Results from the present experiment showed a better performance of seeds from fruits harvested 60 or 70 DAA was much better in terms of vigour. This corroborates with earlier reports of Vidigal *et al.* (2009) for pepper and Dias *et al.* (2006) for tomato where post-harvest fruit storage increased seed vigour as indicated by first count of germination & controlled deterioration test.

There was no germination of seeds for *cv. Kpando* when fruits were harvested 30 DAA irrespective of post fruit storage treatment (Table 3). However, after 15 days of fruit storage induced seed germination in *cv. Oforiwa* (46%). The present results is consistent with earlier reports (Botey *et al.,* 2021b) when fruits harvested 25 - 30 DAA recorded no or less than 10% germination. In pepper, Sanchez *et al.* (1993) reported no germination of fruits harvested 30 DAA despite postharvest storage of 28 days. Similarly, Barbedo *et al.* (1999) found that cucumber seeds obtained from early harvested fruits (25 - 35 DAA) and stored for 15 days had no or low seed germination. For eggplant, Passam *et al*. (2010) results corroborates with the present study in that germination did not occur in earlier harvests (25 – 35 DAA) until 45 DAA prior to after-ripening of fruits. In their case however, after-ripening for 20 days under 25 °C induced germination in these earlier harvests significantly between 44 to 100 percent.

After-ripening treatment had significant effect on seed germination particularly for fruits harvested earlier. The germination of seeds from 40 and 50 DAA started to increase with after-ripening treatment and was highest at 15 days of storage in both cultivars (Table 3). In most cases, germination of seeds were above satisfactory levels (> 90%) except for cv. *Oforiwa* at 40 DAA (67%) (Table 3).

Since, after-ripening is considered as a main dormancy breaking treatment (Iglesias-Fernaes *et al.,* 2010), it is assumed that the no or low germination observed in the earlier harvests could be attributed to primary dormancy relating to physiological seed immaturity was released during the post-harvest storage period. The observed positive effect of after-ripening on fruits harvested earlier (40 to 50 DAA) on seed germination could be attributed to the *in situ* priming principle reported by Welbaum & Bradford (1991). This is achieved due to the fact that seeds at the maturity stage are held at moisture levels that is close to full imbibition, thus with sufficient oxygen supply, the seeds viability can be maintained for considerable period while preventing precocious germination (Bradford, 1995). The current results is consistent with other Solanaceous crops (Dias *et al*., 2006; Passam *et al.,* 2010, Kortse *et al.,* 2017, Ozden & Demir, 2018).

The results from the present study further showed that, germination of seeds did not improve by storing fruits (after-ripen) harvested 60 and 70 DAA. This is because, at this stage, the seeds had attained physiological maturity (dry seed matter content and germination capacity) and had apparently completed its seed filling stage (Botey *et al*., 2021). These results are consistent with that of tomato seeds where post-harvest storage of fruits harvested 50 or 60 DAA did not significantly affect seed germination (Vidigal *et al*., 2006), in pepper (Vidigal *et al.,* 2009) and in eggplant (Passam *et al.,* 2010). This suggests that when fruits of African eggplant are allowed to mature on the mother plant and harvested at 60 or 70 DAA, maximum seed vigour and germination quality can be obtained, hence there is no much benefit when fruits are subjected to after-ripen (post-harvest storage). This results agrees with an optimum harvest time of 62-76 DAA for this species studied under both tropical monsoon and temperate oceanic climates (Botey *et al.,* 2021). However, when fruits are harvested earlier (40 or 50 DAA), after-ripen of fruits is necessary to obtain maximum seed vigour and germination.

The interactive effect of maturity stage of harvest and after-ripening significantly improve the mean germination time ($F = 11.45$; $p < 0.000$) and time to reach 50% germination ($F = 9.75$; $p < 0.000$) as shown in Figure 2. There is an inverse relationship of maturity

and after-ripening on the time required for seed to complete germination or reach half the germination process. As seed matures, the time required to complete the germination process decreases. Seeds that were extracted from 70 DAA fruits without after-ripening gave the shortest time (MGT) to complete germination. This is due to the fact that seeds at this stage had attained physiological maturity and more vigorous.

Conclusion

Seeds of African eggplant (*Solanum aethiopicum* L.) within the fruit continue to fill and mature even when detached from the mother plant, before physiological maturity. It is also established that precocious harvest (30 DAA) was not beneficial to physiological quality in African eggplant seeds even when subjected to 15 days after-ripening. An after-ripening treatment up to 15 days can improve seed vigour and germination quality of early harvests (40 to 50 DAA). Irrespective of after-ripening treatment, both seed vigour and germination are maximum at 70 DAA. This coincides with maximum dry seed weight that is physiological maturity (PM) for cv. *Kpando* while cv. *Oforiwa* requires 10 days more after PM to attain maximum germinability. It can, therefore, be concluded that after-ripening is inconsequential and not necessary when seeds are harvested at physiological maturity. For the purposes of seed production, African eggplant fruits should be harvested 60-70 DAA maximum seed quality.

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