

# Fungal pathogens associated with stored maize and nutritional quality losses along supply chain in southwestern Ethiopia: Implication for food security

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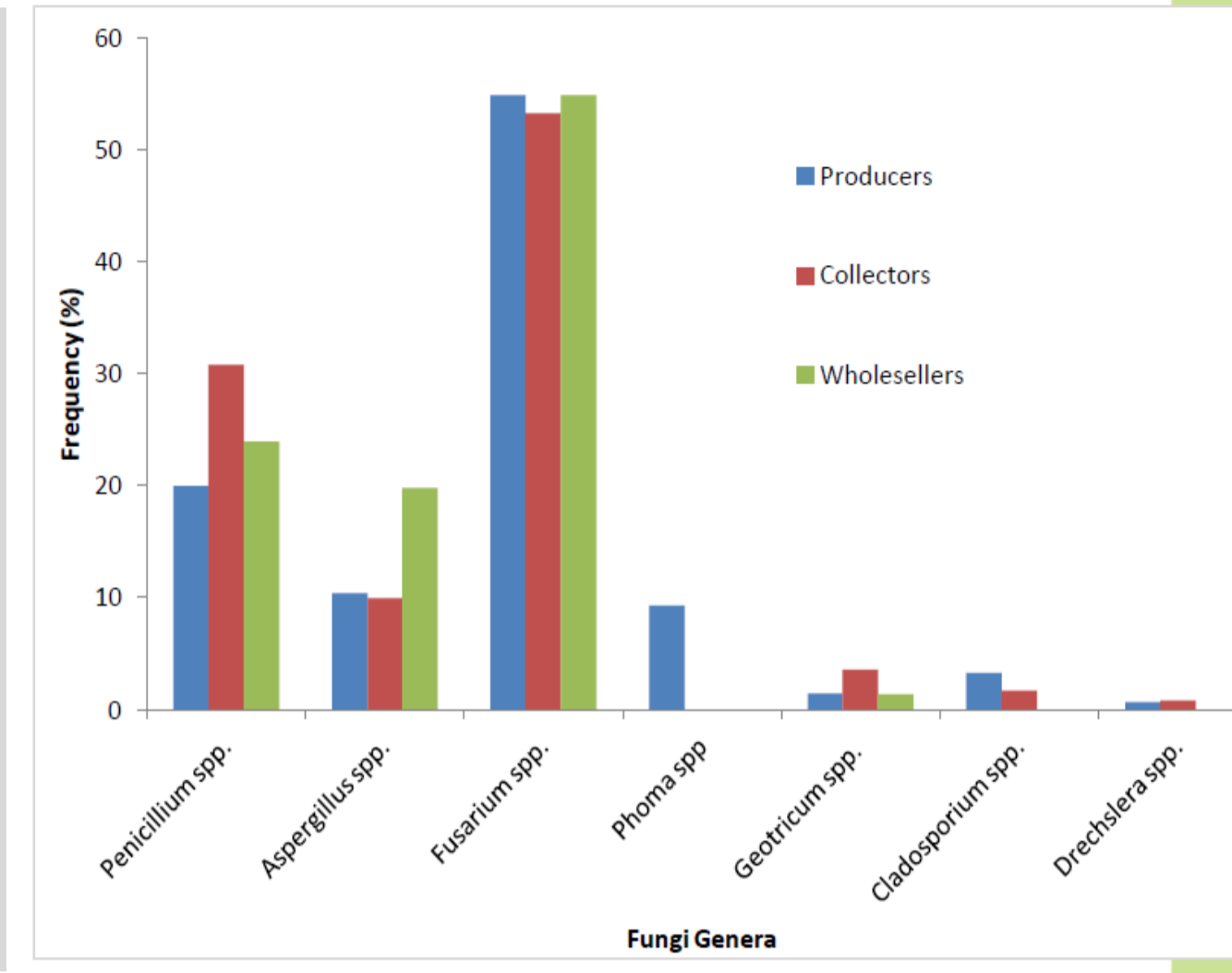
## Introduction

- Maize is a major staple food crop for millions of people in southwestern Ethiopia.
- It plays key role in food security and also know as low cost of calorie compared to other cereal crops.
- However, maize post-harvest losses is tremendous that leads to both quantity and quality losses.
- This study was initiated to assess fungal pathogens associated with stored maize and nutritional quality losses along supply chain.



## Results

- *Fusarium* spp. was dominate under all actors storage conditions
- *Penicillium* spp. ranked 2<sup>nd</sup> followed by *Aspergillus* spp.

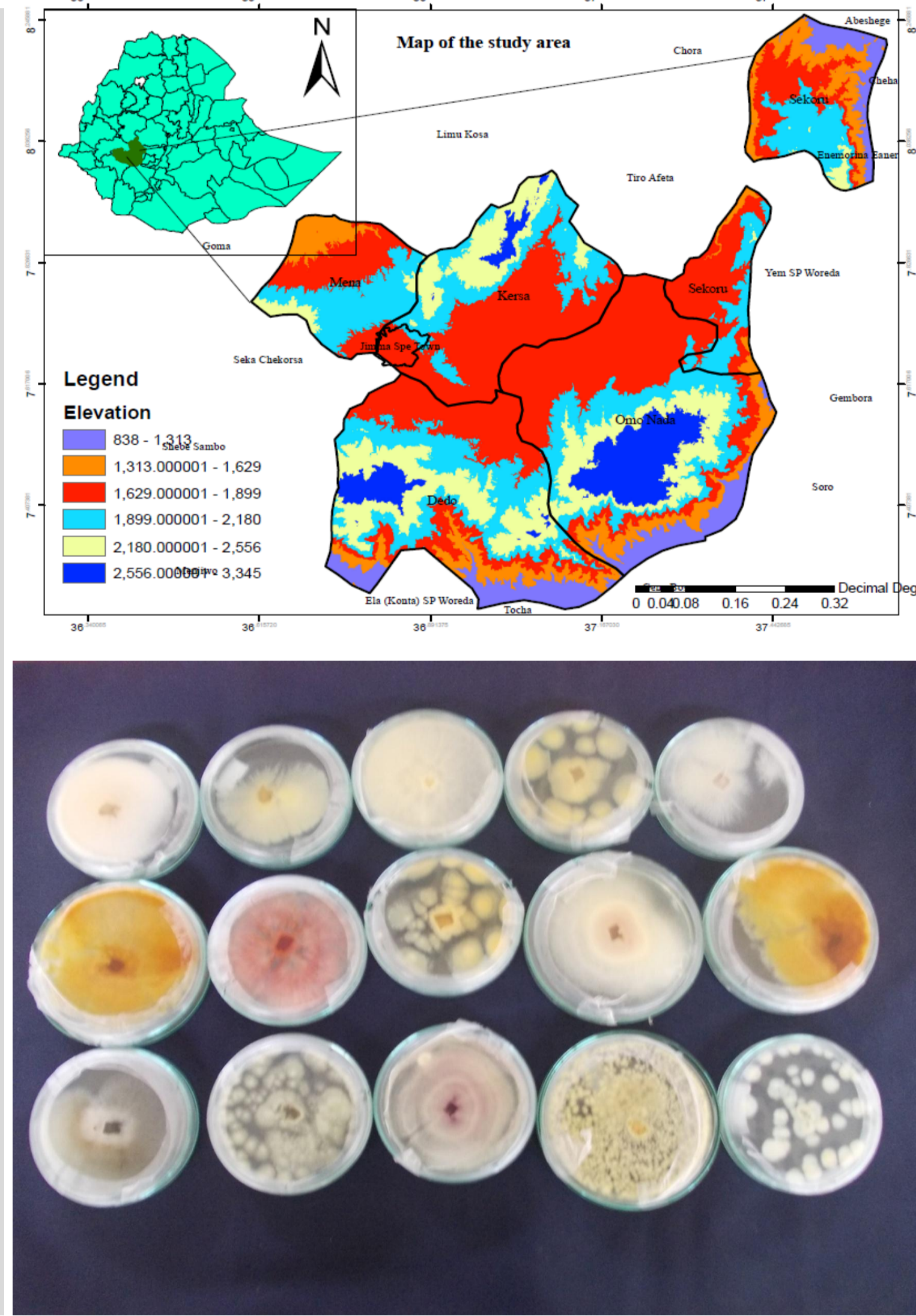


Frequency of occurrence and relative density of major fungal genera on stored maize (average of six months under all actors store).

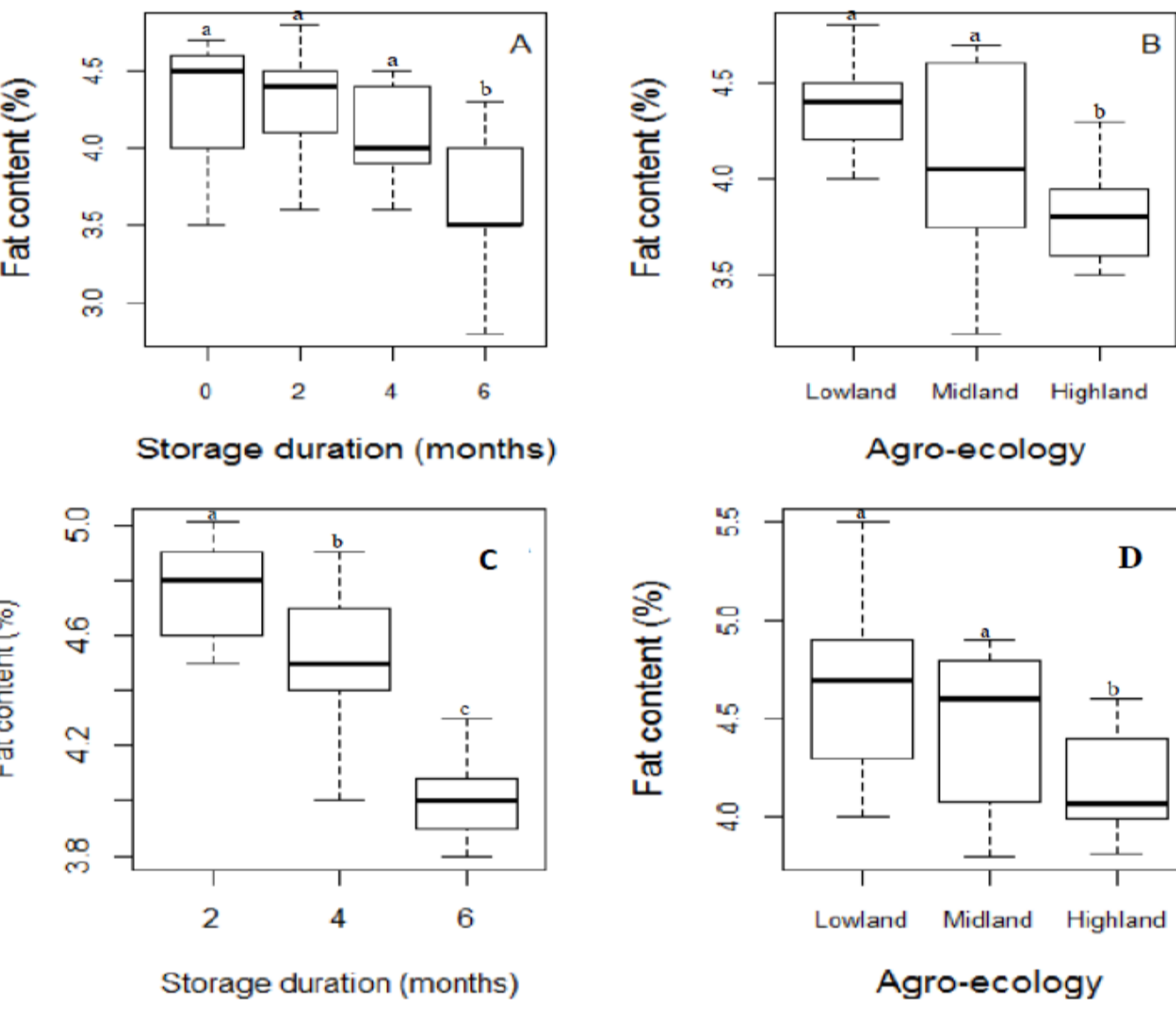
Fungal genera	Parameters	Mean	SD	Increment (%)
<i>Pencillium</i> spp.	Frequency	27.72	18.25	67.06
	Relative density	20.54	13.37	73.29
<i>Asparagillus</i> spp.	Frequency	14.92	12.76	92.6
	Relative density	10.82	9.51	87.43
<i>Fusarium</i> spp.	Frequency	49.19	20.37	-83.79
	Relative density	57.66	20.66	-85.95

## Methodology

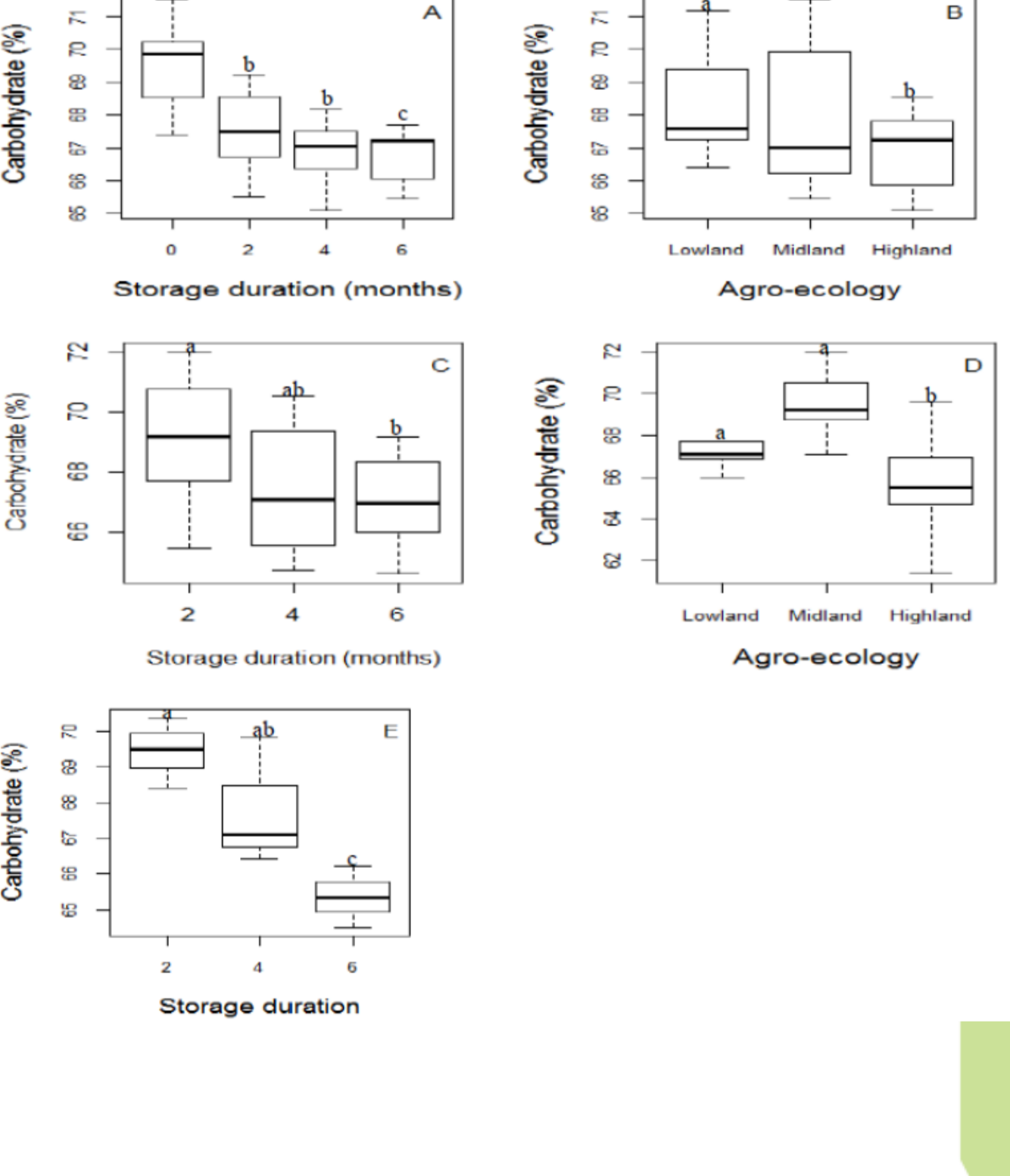
- Five districts used for fungal pathogens study
- Samples collected from 63 stores based on monthly interval.
- Fungal pathogens were identified to genus level based on morphological characteristics
- While three districts considered for nutritional analysis and samples collected every two months from 27 stores.
- Crude protein, crude fat, CHO, calorific value and major mineral analysis carried out following international standard of Association of Analytical Chemists methods.



- Box plots showing fat content of maize kernels collected from farmers store A (across storage duration) and B(across agro-ecology); collector storage C(across storage duration) and D (agro-ecology).



- Box plots for carbohydrate content of stored maize A) under farm conditions for storage duration and B) at different agro-ecology C) Under collector conditions along the storage duration and D) across agro-ecology E) Under wholesaler condition along the storage duration.



- Crude protein, calorific value and phosphorus content also significantly ( $P < 0.05$ ) decreased as the storage duration increased across all actors' store.
- But fibre, ash and major mineral (Ca, Zn, and Fe) content increased significantly over the storage period.

## Conclusions

- Major fungal genera isolated from stored maize have potential to produce mycotoxin in addition to quality deterioration. Stored maize under all actors along maize supply chain resulted in high quality losses, which has great implication on nutrition insecurity and hidden dietary hunger for the society. Also, high increases in fiber content above the optimum have great implication on nutrient absorptions. Thus, there is a need to develop and disseminate appropriate storage technologies that minimize quality loss in the store.