Content and changes in Provitamin A carotenoids during ripening of fruit from four popular Musa cultivars consumed in Eastern Democratic republic of Congo

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INTRODUCTION

Vitamin A deficiency (VAD) is a major public health problem in the Democratic Republic of Congo (DRC) and just as in other developing countries, provitamin A carotenoids (pVACs) from plants are the main source of vitamin A for most rural-agriculture dependent households. Bananas (East African Highland bananas and plantain) are among the predominant crops grown in Eastern DRC where they form a major part of the diet. Studies on bananas from Hawaii and the Philippines indicate that bananas could be good sources of micronutrients especially pVACs, it is therefore necessary to assess the potential contribution of Musa cultivars grown in Eastern DRC in fighting VAD.

OBJECTIVES

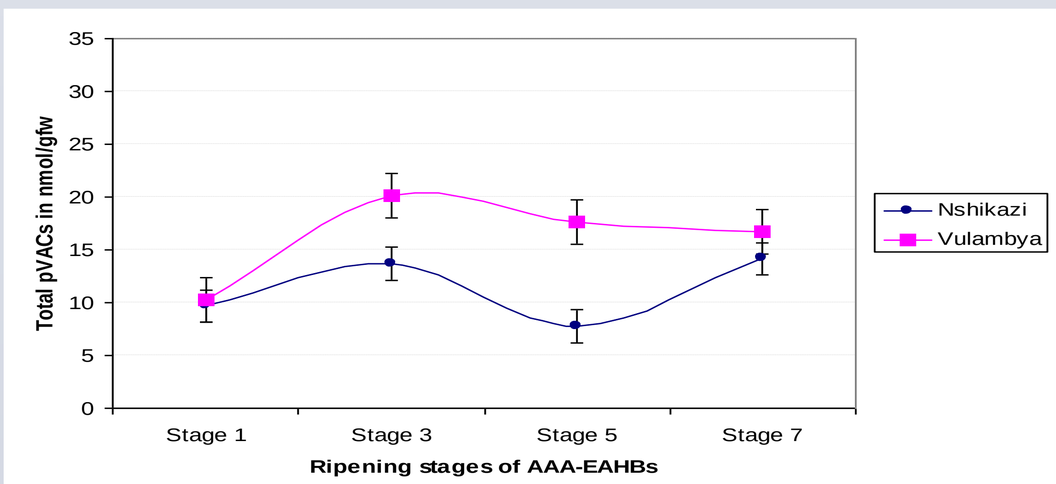
To establish the content and changes in provitamin A carotenoids following ripening of four popular Musa cultivars from Eastern Democratic Republic of Congo

METHODS

- Two middle hands of mature bunch of each cultivar sampled
- Ripened naturally & sub-sampling done at stages 1,3,5 & 7

- Musa fruit samples stored at -20^{0}c, after sub-sampling
- lyophilised for 72hrs and HPLC analysis carried out in trplicates

RESULTS



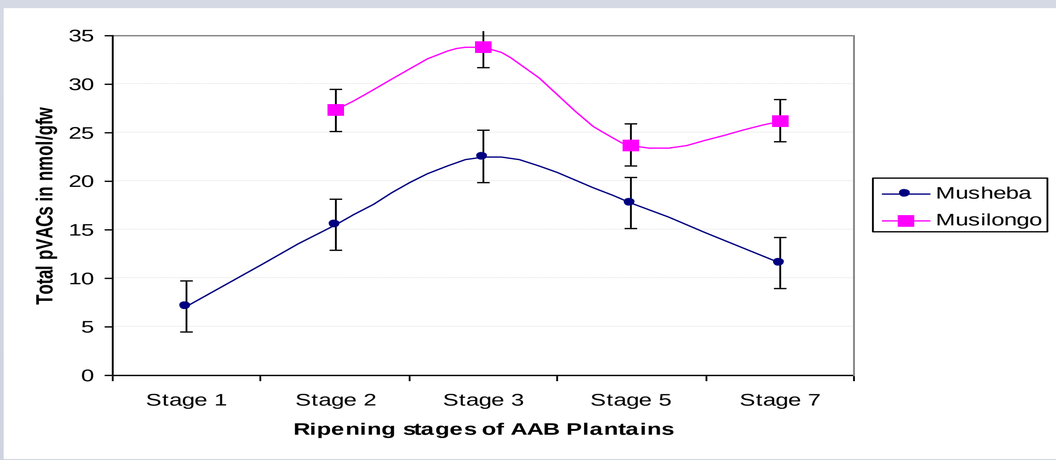


Figure 1. Changes in total pVACs in Musa fruit pulp following ripening

RESULTS cont..

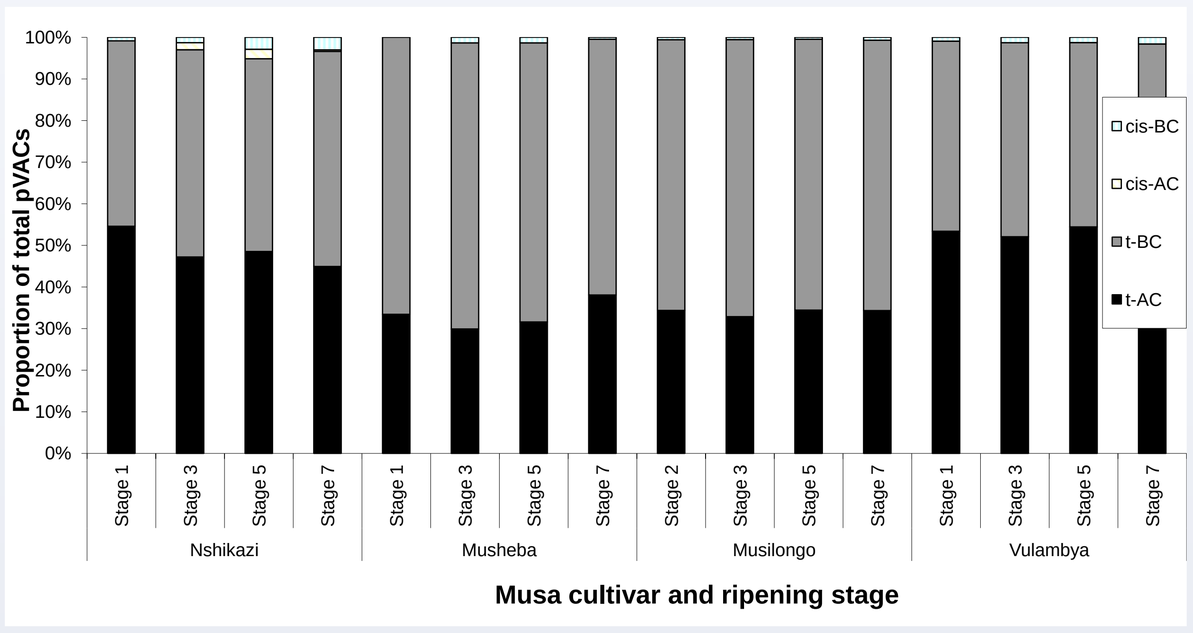


Figure 2. Proportion of provitamin A carotenoids in the Musa fruit

Table 1. Content of specific carotenoids in the Musa fruit in nmol/gfw

Musilongo AAB			
Ripening stage	t-AC	t-BC	Total pVACs
2	9.38^c	17.76^c	27.31^c
3	11.13^d	22.57^d	33.88^d
5	8.17^a	15.44^a	23.73^a
7	9.00^b	17.04^b	26.22^b
p- Value	<0.001	<0.001	<0.001

Means in the same column with the same letter are not significantly different

Musheba AAB			
Ripening stage	t-AC	t-BC	Total pVACs
1	2.36^a	4.71^a	7.07^a
3	6.74^d	15.51^d	22.55^d
5	5.63^c	11.94^c	17.80^c
7	4.39^b	7.09^b	11.53^b
p-Value	<0.001	<0.001	<0.001

Vulambya AAA-EA			
Vulambya: Ripening stage	t-AC	t-BC	Total pVACs
1	5.50a	4.71a	10.31a
3	10.48^d	9.39^d	20.13^d
5	9.58c	7.81c	17.61c
7	8.86b	7.50b	16.63^b
p- Value	<0.001	<0.001	<0.001

Means in the same column with the same letter are not significantly different

Nshikazi AAA-EA			
Ripening stage	t-AC	t-BC	Total pVACs
1	5.28b	4.31^b	9.67^b
3	6.47^c	7.32^c	13.70^c
5	3.77^a	3.60^a	7.77^a
7	6.36^c	6.83^c	14.16^c
p-Value	<0.001	<0.001	<0.001

CONCLUSIONS

- During ripening, content and changes in individual and total pVACs are cultivar dependent,
- There is retention of pVACs during Musa fruit ripening.
- Highest levels of pVACs are present at ripening stage 3 (1081µg/100gFM in 'Vulambya' and 1820µg/100gFM in 'Musilongo')

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