

# The genetics of carotenoid levels in potato tubers

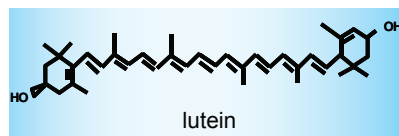
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## Potatoes and carotenoids

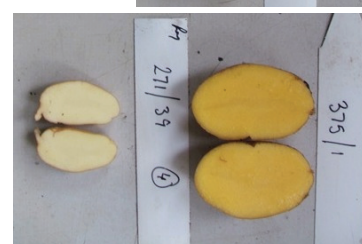
- Potatoes are the 4th crop worldwide.
- Most important non-grain food crop.
- High levels of beneficial nutrients including potassium and Vitamin C.
- Carotenoids are important in the diet.
- Over 700 carotenoids as naturally occurring pigments, furnishing many fruits and flowers with colours.
- 20-fold variation in levels of carotenoids in potato tubers.



## Genetic segregation

### Population 1:

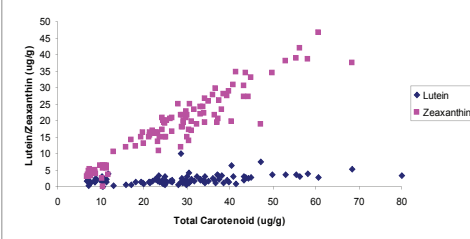
- 3:1 segregation
- high levels of zeaxanthin
- overall high carotenoids



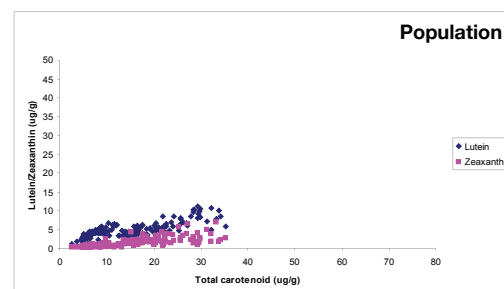
### Population 2:

- 1:1 segregation
- low levels of zeaxanthin
- overall lower carotenoids

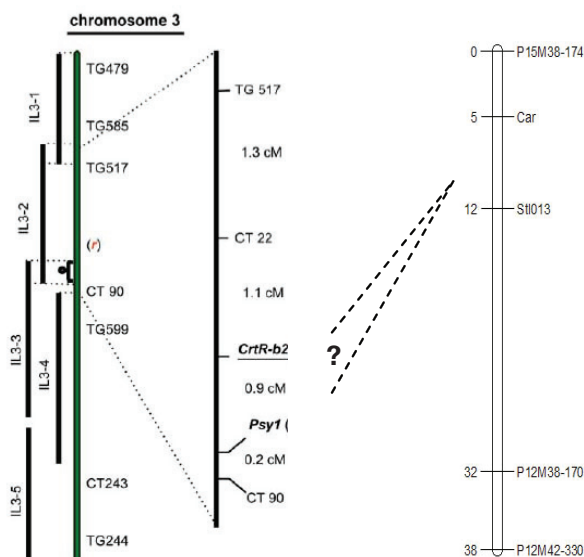
### Population 1



### Population 2



## Located to chromosome 3

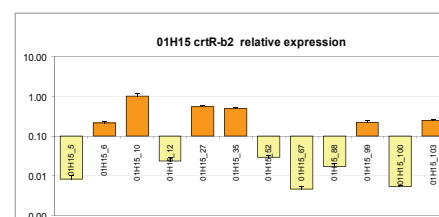


Thorup et al. 2000 - tomato

Population 1 - located on AFLP and SSR map.

- Two possible pathway genes on linkage group
- *Psy-1* for phytoene synthase
- *CrtR-b2* for beta-carotene hydroxylase
- the latter gene shown to co-segregate perfectly with carotenoid type

## Expression level of beta-carotene hydroxylase matches *crtR-b2* haplotype, and total carotenoids



## Acknowledgements

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