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Signs of epigenetic regulation of spring phenology in *Abies nordmanniana* emblings*

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Temperature during somatic embryogenesis had a signinfiant effect on the spring phenology of emblings

Climate change implications of the study

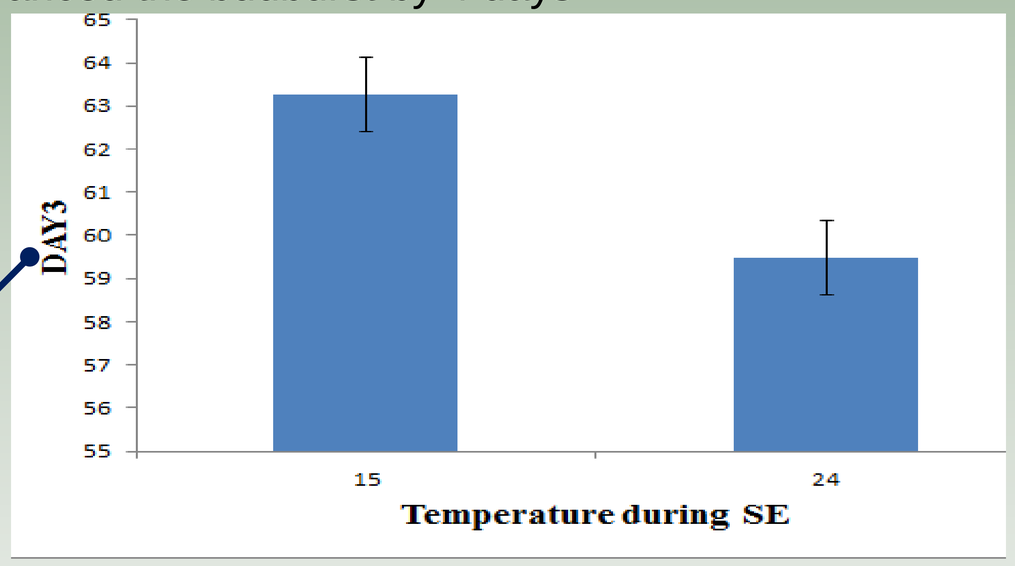
- Epigenetically modified phenotypic plasticity can provide a faster mechanism for adaptation to climate change in trees
- Advance of bud bust in warmer climate can allow the tree to better utilize a longer growing season in future climate
- It can also lead to increased spring frost damage
- The epigenetic response was under genetic control- clones responded differently
- Include the effect in breeding for climate resilience

Materials & Methods

- 10 clones of *A. nordmanniana*
- Somatic embryogenesis (SE) at two different temperatures
- Spring phenology
- Photosynthesis measurement using CIRAS-3 Portable Photosynthesis System
- Water stress induced during somatic embryogenesis

and emblings were tested for water stress adaptation

Change of 9˚ celcius during somatic embryogenesis advanced the budburst by 4 days



Assessment of spring phenology
DAY3 - day the tree reached a score of 3

Future prospectives

- Molecular mechanism behind the epigenetic response- DNA methylation
- RNA seq studies to test if the methylation results is differentially expressed genes
- Ongoing research to find differences in optimum temperature for photosynthesis depending on the temperature during SE (so far the results are not clear)
- The results on the effect of water stress induced during SE on the drought adaptation of emblings also needs further testing
- Continued assessment of spring phenology in field to see if the observed response is stable after many years

*Emblings- plants produced through somatic embryogenesis