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Researchers map daffodil's chloroplast genome for the first time

November 6, 2018, University of Reading



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Gardeners might end up never planting the wrong bulb again after the Royal Horticultural Society (RHS) and Reading University successfully mapped a daffodil's chloroplast genome for the first time.

When sold as dry bulbs daffodils are impossible to tell apart, with more than 1,766 different cultivars—including pink, green, trumpeted and double-headed – available in the UK.

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In the first step towards identifying different cultivars in bulb form, researchers from the RHS and Reading University mapped the entire code which makes up the chloroplast genome – the DNA responsible for photosynthesis in plants.

Dr. Alastair Culham, Associate Professor of Botany at Reading University, said:

"The technology used in this project is fast moving and it will be both practical and affordable for routine use within the next 10 years. As a keen gardener I have sometimes been disappointed to find special bulbs I've planted in the Autumn have turned out to be less good varieties when they come in to flower in the spring. Better management of the supply chain and the ability to authenticate dormant bulbs should stop such mistakes in the future." The code was built by extracting DNA from the leaf material of a pheasant's eye daffodil (*Narcissus poeticus*) grown at RHS Garden Wisley. The data was then examined and the 2% relating to the chloroplast genome pulled out and assembled.

Never before done for daffodils, the team can now look for variations in the genetic markers that could be effective in distinguishing between cultivars. This could eventually be used to avoid the wrong bulbs being traded and aid conservation efforts, new breeding and the registration of cultivars.

The work could also be applied to other bulbous plants like snowdrops, crocus and hyacinths which are being busily planted by the UK's 27 million gardeners this autumn.

John David, Head of Horticultural Taxonomy, at the Royal Horticultural Society said:

"This is an exciting first step in identifying daffodil varieties at the point they are most popularly bought but when there is nothing to tell them apart. With so many bulbs due to be planted this autumn it is a huge industry and we hope our work might avoid disappointment for professionals who plant en masse and gardeners who will often seek out their tried and tested favourites."

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More information: Kálmán Könyves et al. The complete chloroplast genome of *Narcissus poeticus* L. (Amaryllidaceae: Amaryllidoideae), *Mitochondrial DNA Part B* (2018). **DOI: 10.1080/23802359.2018.1521311**

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