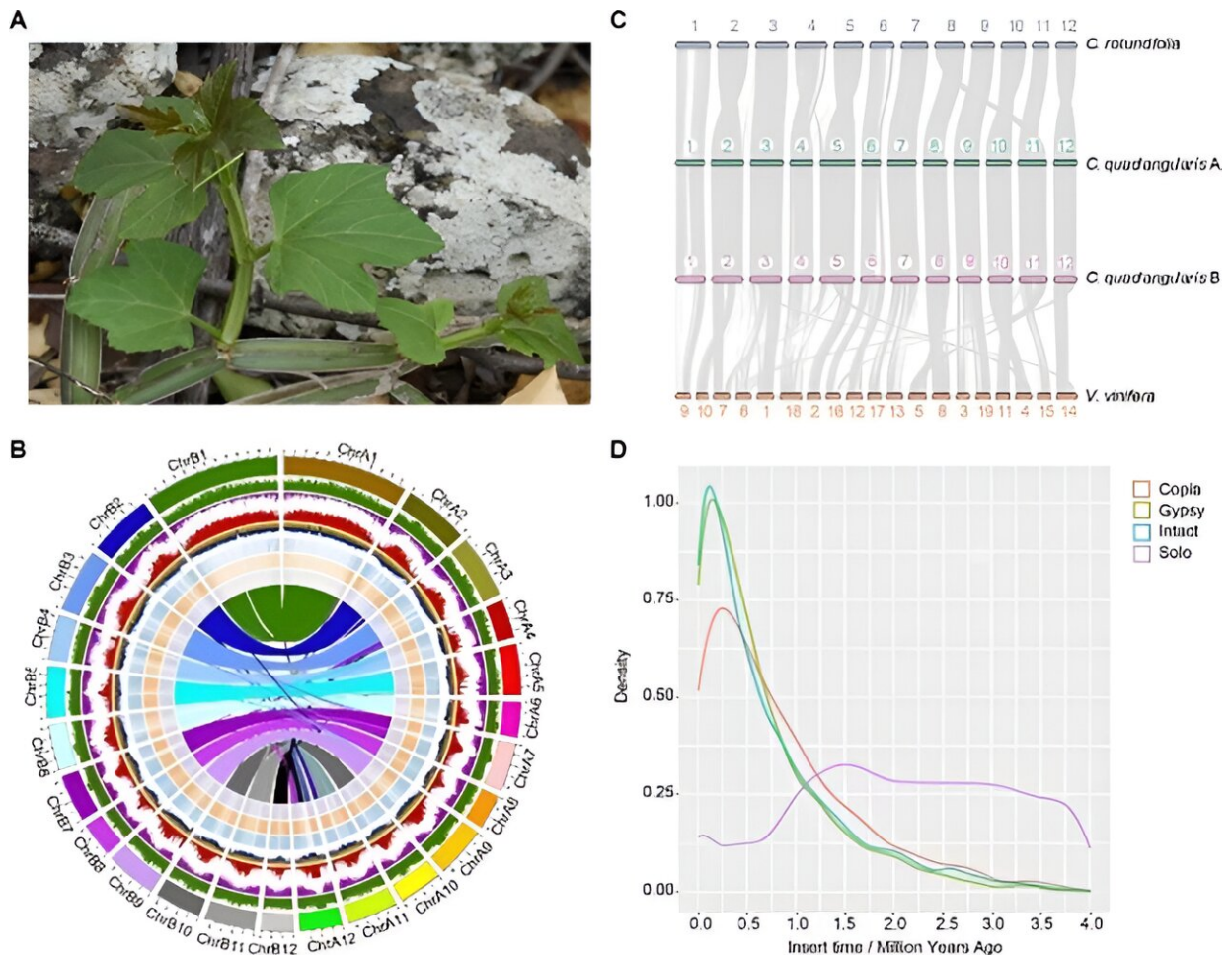


Desert hero unveiled: *Cissus quadrangularis* genome decodes drought survival tactics

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Morphology and genome evolution of *Cissus quadrangularis*. Credit: *Horticulture Research* (2024). DOI: 10.1093/hr/uhae038

As water scarcity looms as a major threat to global ecosystems and food production, the quest to understand how plants like *Cissus quadrangularis* conquer arid landscapes is more critical than ever. The genetic blueprint of such species could hold the key to enhancing agricultural resilience in the face of climate change.

A [recent study](#), the result of a collaborative international effort, was published in *Horticulture Research* on February 2, 2024, that presents an in-depth analysis of the *Cissus quadrangularis* [genome](#), shedding light on its extraordinary drought tolerance and distinctive photosynthetic mechanisms.

The meticulous mapping of *Cissus quadrangularis*'s genome has uncovered a tapestry of genetic adaptations that allow it to thrive in desert conditions. The 679.2 Mb genome, rich with 51,857 [protein-coding genes](#), reveals that nearly half is composed of repetitive sequences, highlighting the genetic complexity of polyploidy.

The dominant sub-A genome stands out, with its robust gene expression during drought, pointing to a pivotal role in the plant's survival strategy. The study also spotlights the activation of key metabolic pathways in the stem, pivotal for [water conservation](#).

The distinct diurnal gene expression in the stems, in contrast to the leaves, underscores a specialized evolutionary adaptation, providing profound insights into Crassulacean acid metabolism (CAM) photosynthesis and its role in arid adaptability.

Dr. Qingyun Li, the lead scientist on the project, remarks, "Our work with *Cissus quadrangularis* exemplifies the transformative potential of genomics. The genetic insights we've uncovered are a beacon for developing crops that can endure the increasing aridity, offering a ray of hope for sustainable agriculture."

The insights gleaned from *Cissus quadrangularis*'s genome are set to revolutionize crop breeding, steering towards varieties that can withstand [water scarcity](#). By integrating the CAM pathway and the plant's drought-tolerance genes, the [agricultural sector](#) can advance towards more resilient harvests, safeguarding food supplies in arid climates.

More information: Qingyun Li et al, The *Cissus quadrangularis* genome reveals its adaptive features in an arid habitat, *Horticulture Research* (2024). [DOI: 10.1093/hr/uhae038](https://doi.org/10.1093/hr/uhae038)

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