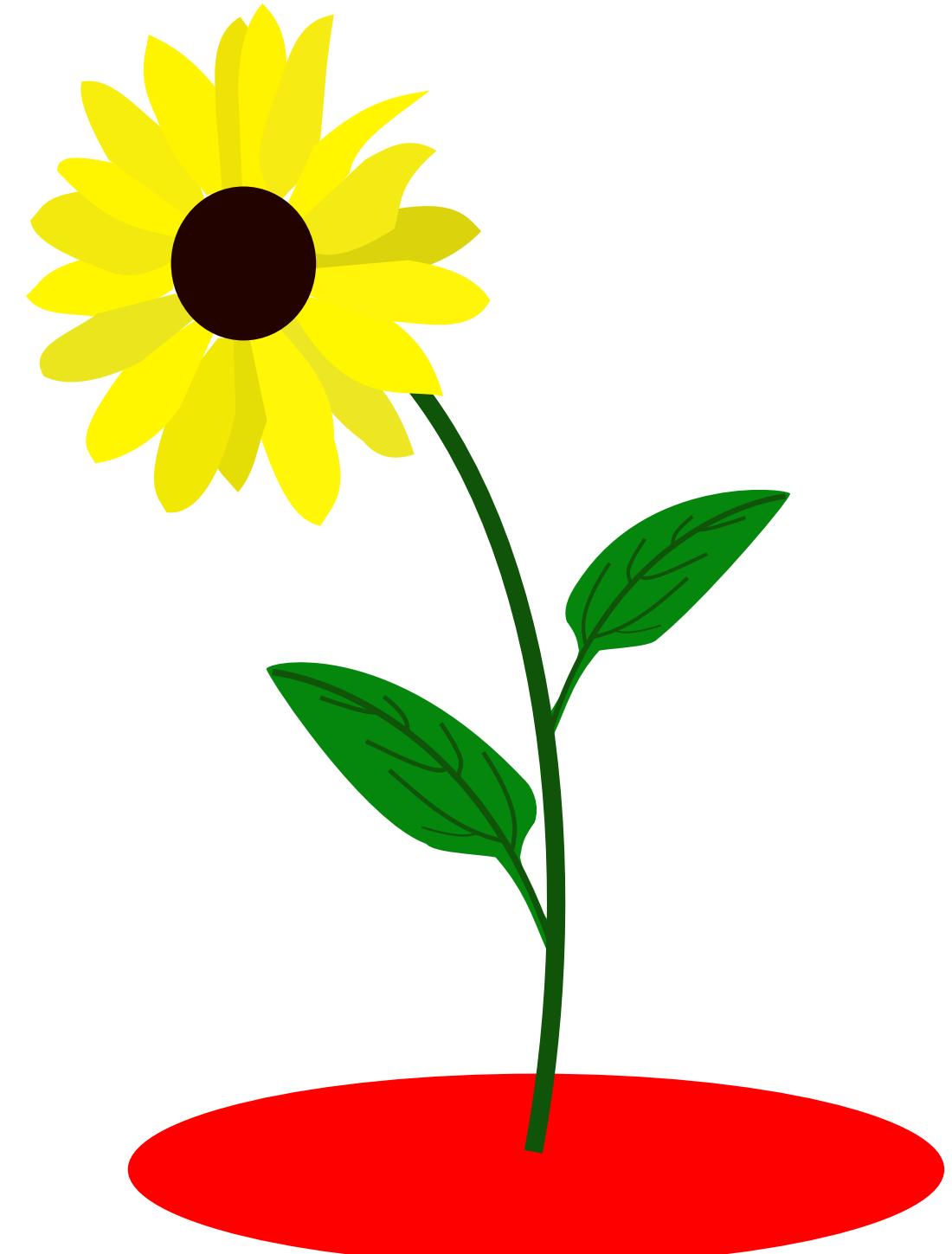


Cytoplasmic genome sharing in annual sunflowers

**Greg Owens,
Assistant Professor
University of Victoria**



Annual sunflowers (*Helianthus*)

- Sub-clade of 11 species with a crown age of ~2 mya
- Found across the USA
- Frequently hybridize



Cytonuclear discordance



An evaluation of alternative explanations for widespread cytonuclear discordance in annual sunflowers (*Helianthus*)

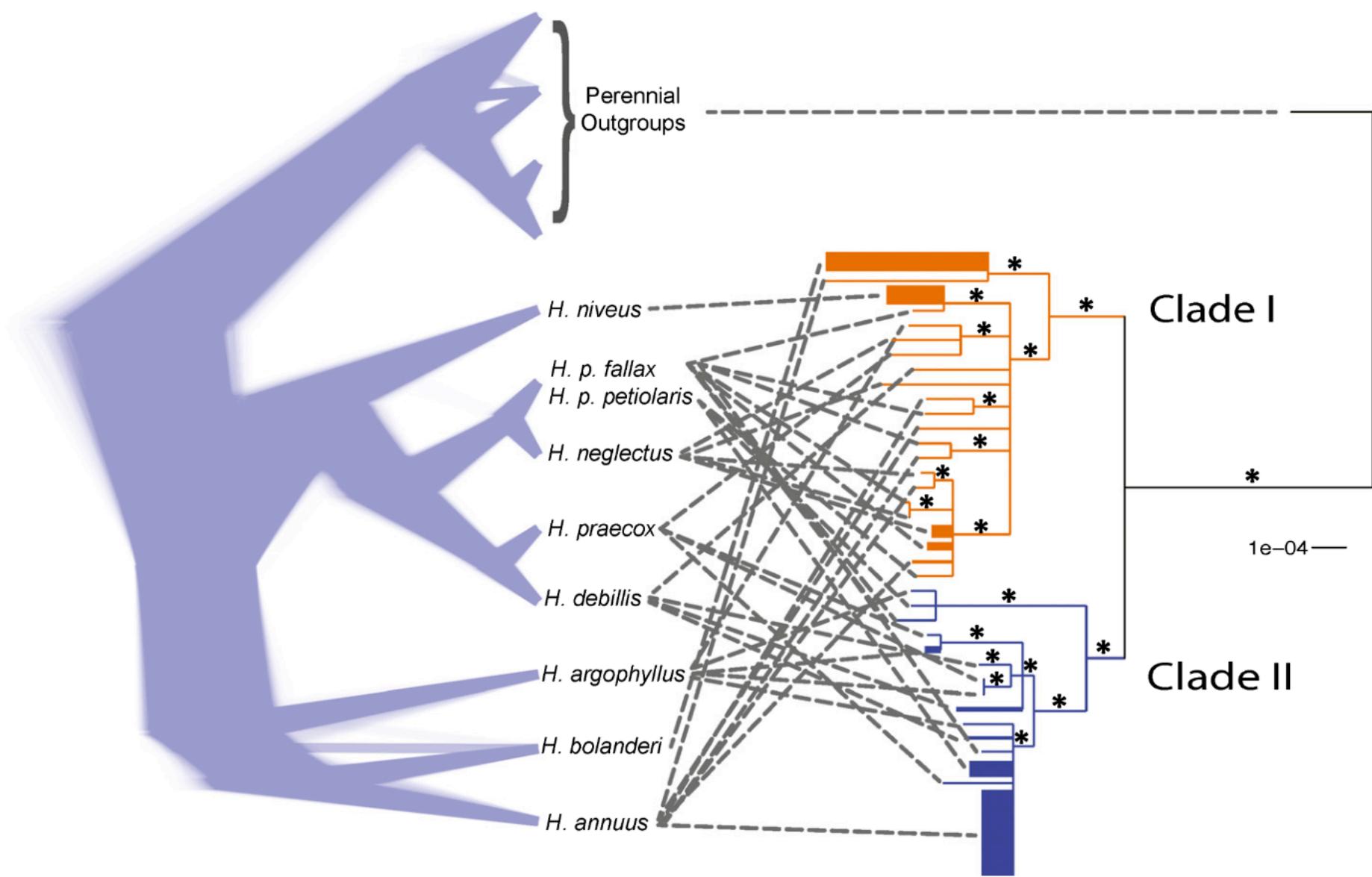
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Research

Nuclear SNPs

Whole chloroplast



Locally adaptive cytoplasm?

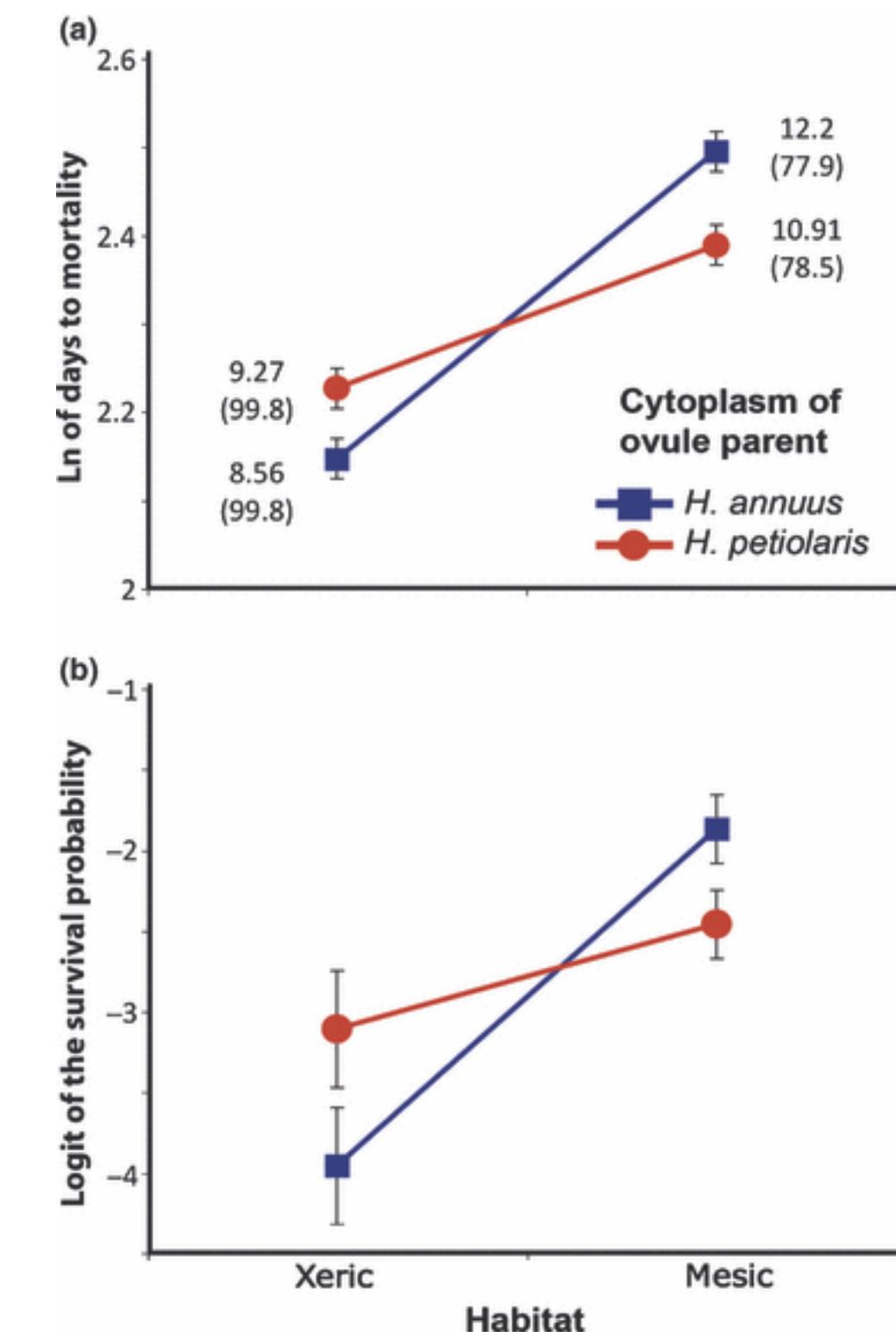


| Full Access

Ecological selection maintains cytonuclear incompatibilities in hybridizing sunflowers

Julianno B. M. Sambatti, Daniel Ortiz-Barrientos , Eric J. Baack, Loren H. Rieseberg

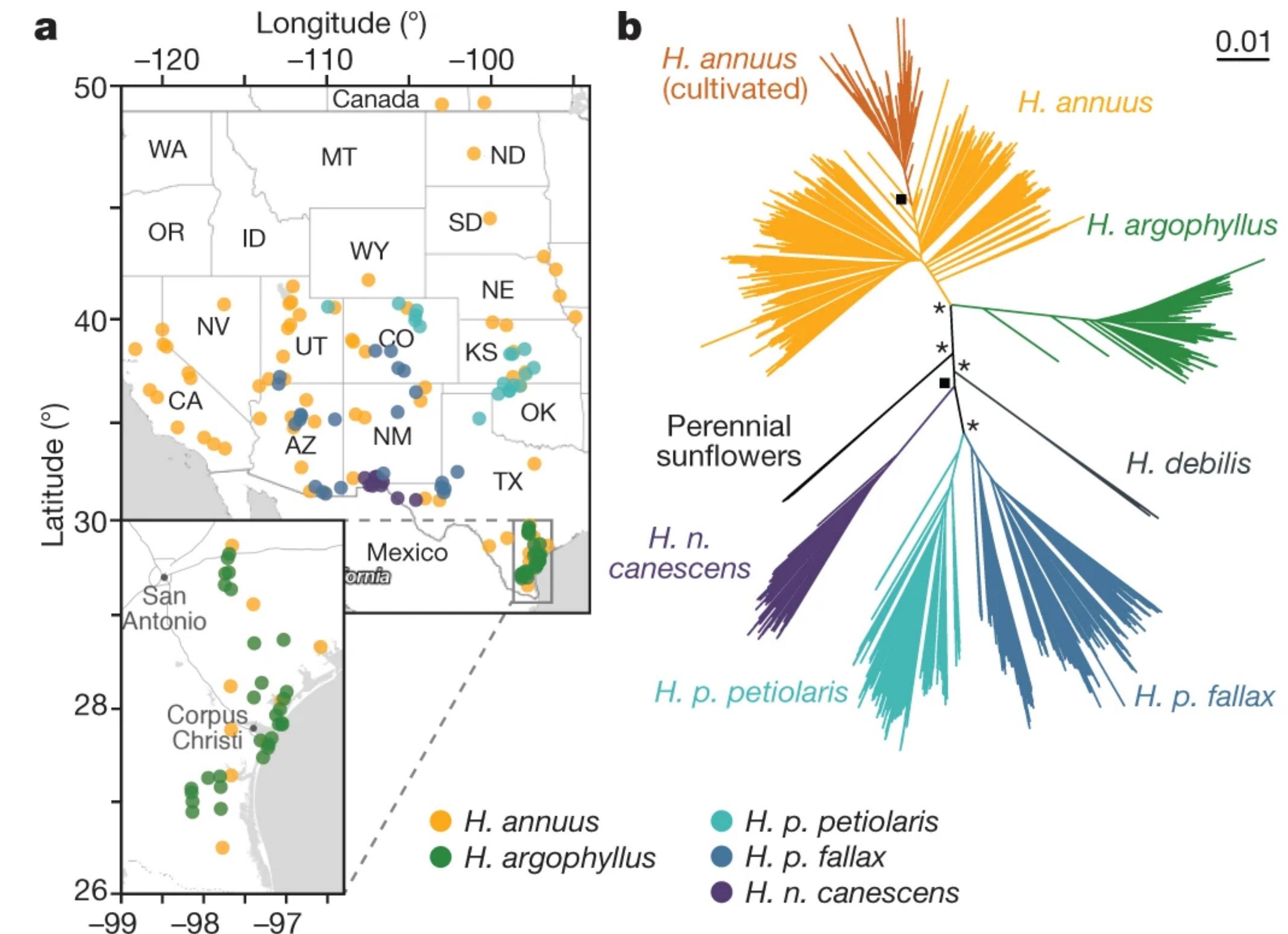
First published: 01 September 2008 | <https://doi.org/10.1111/j.1461-0248.2008.01224.x> | Citations: 82



Why two cytoplasm clades across multiple species?

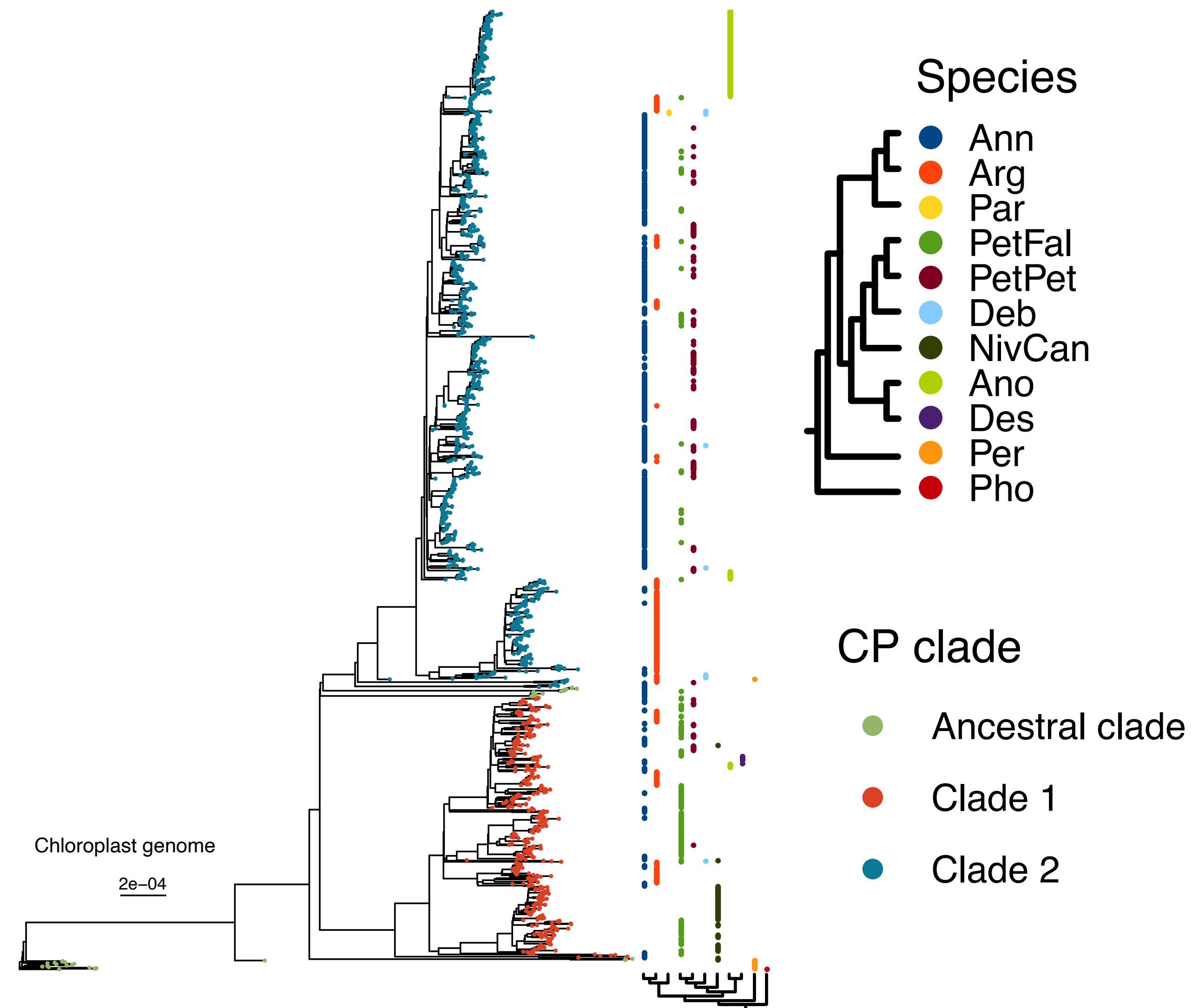
Dataset:

1506 sunflowers from 4 species
+ Whole genome sequencing
+ Common garden phenotype
+ Environment variables



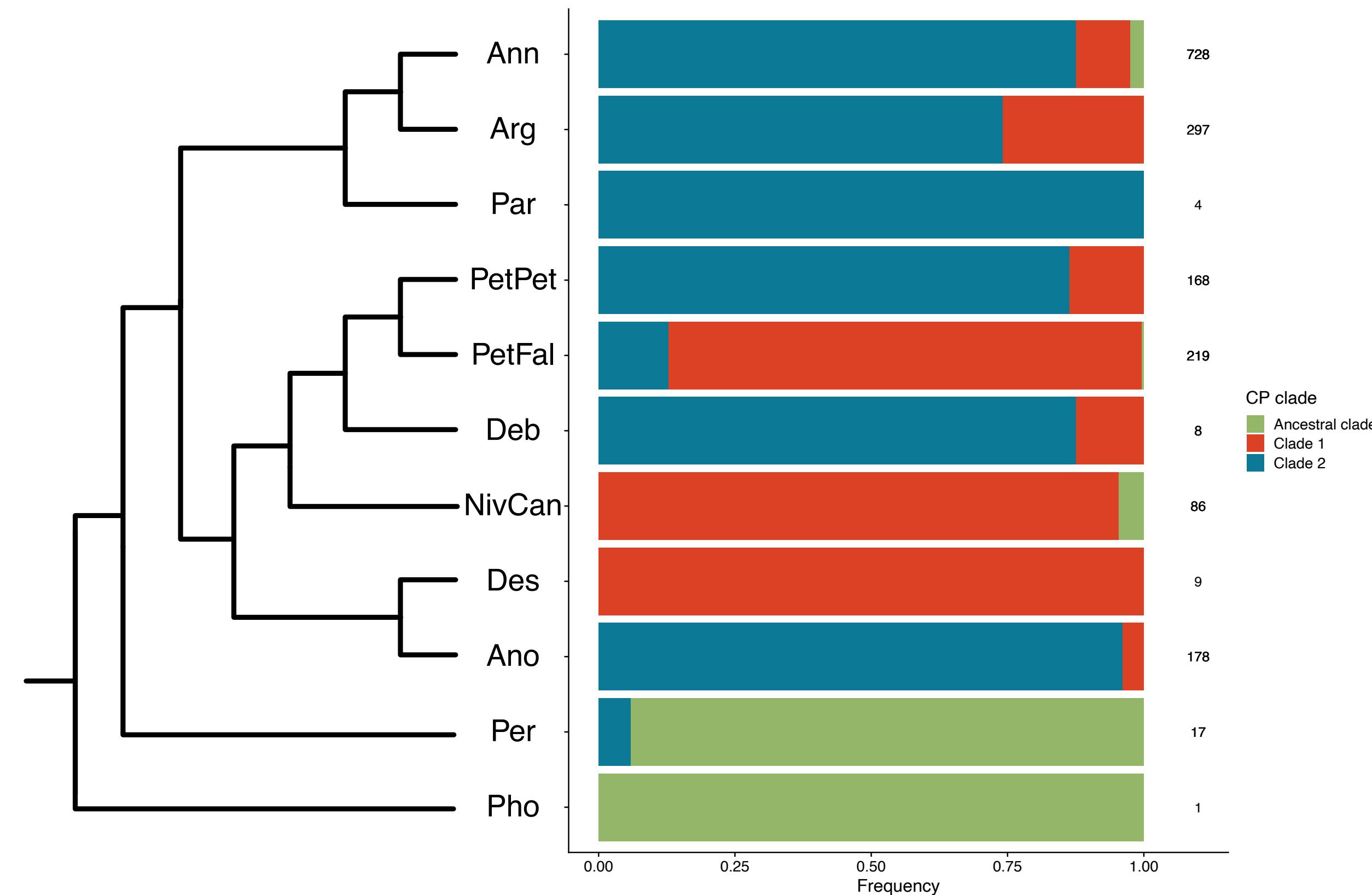
Cytoplasm polymorphism shared across species

Samples rarely group by species based on their cytoplasmic genome.



Cytoplasm polymorphism shared across species

Both cytoplasm clades are found in almost all species

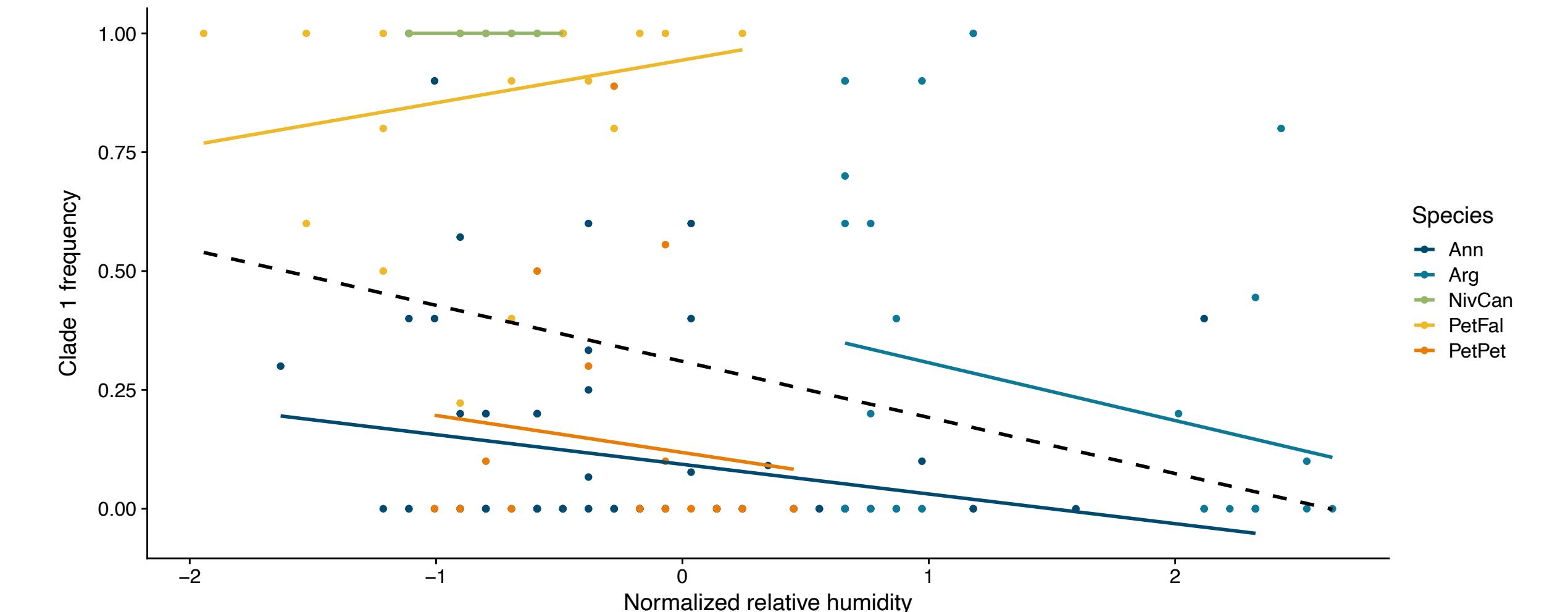
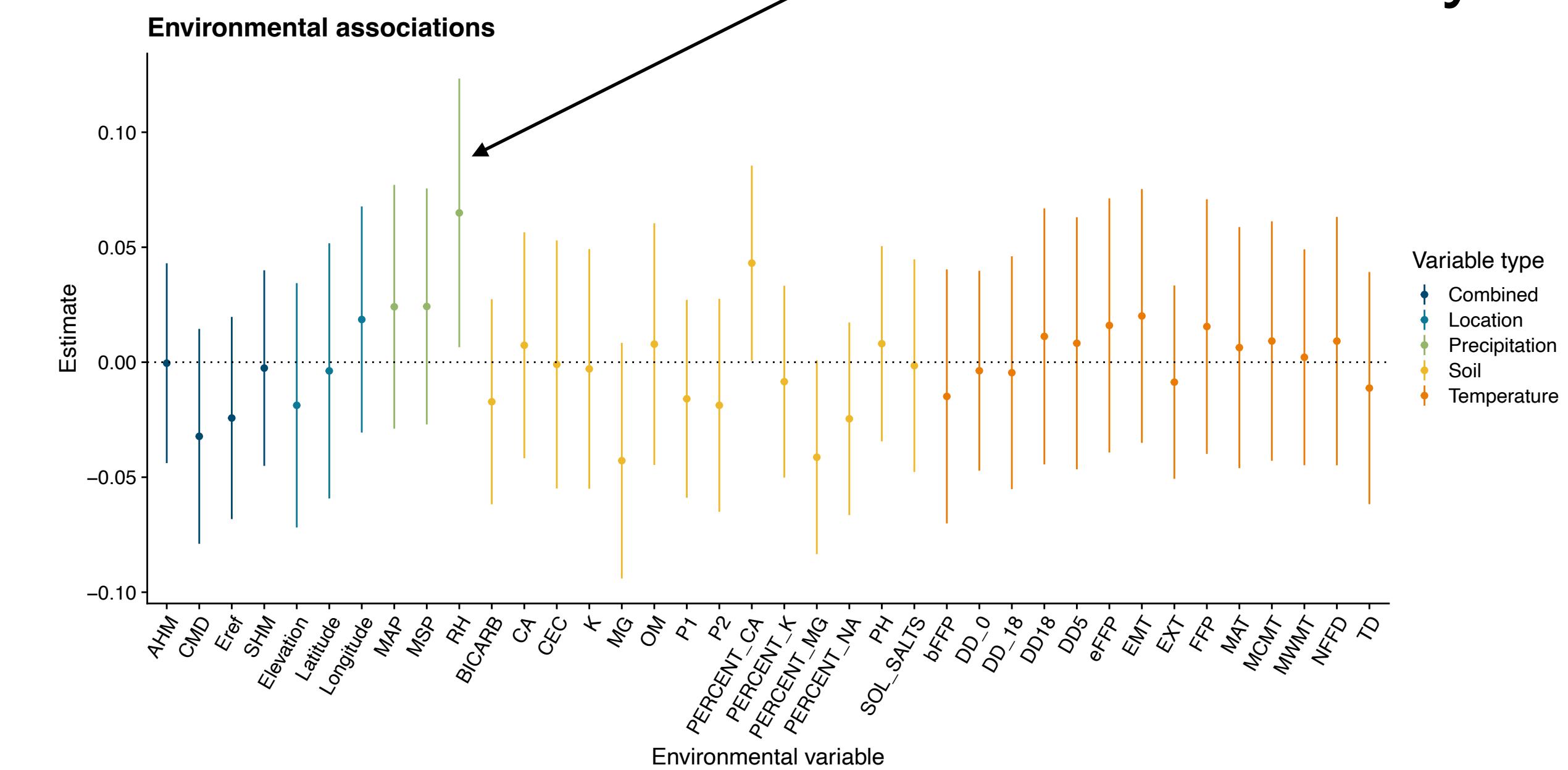


Cytoplasm affects environment

Environment = Species + CP clade

Cytoplasm clade is associated with relative humidity across and within species

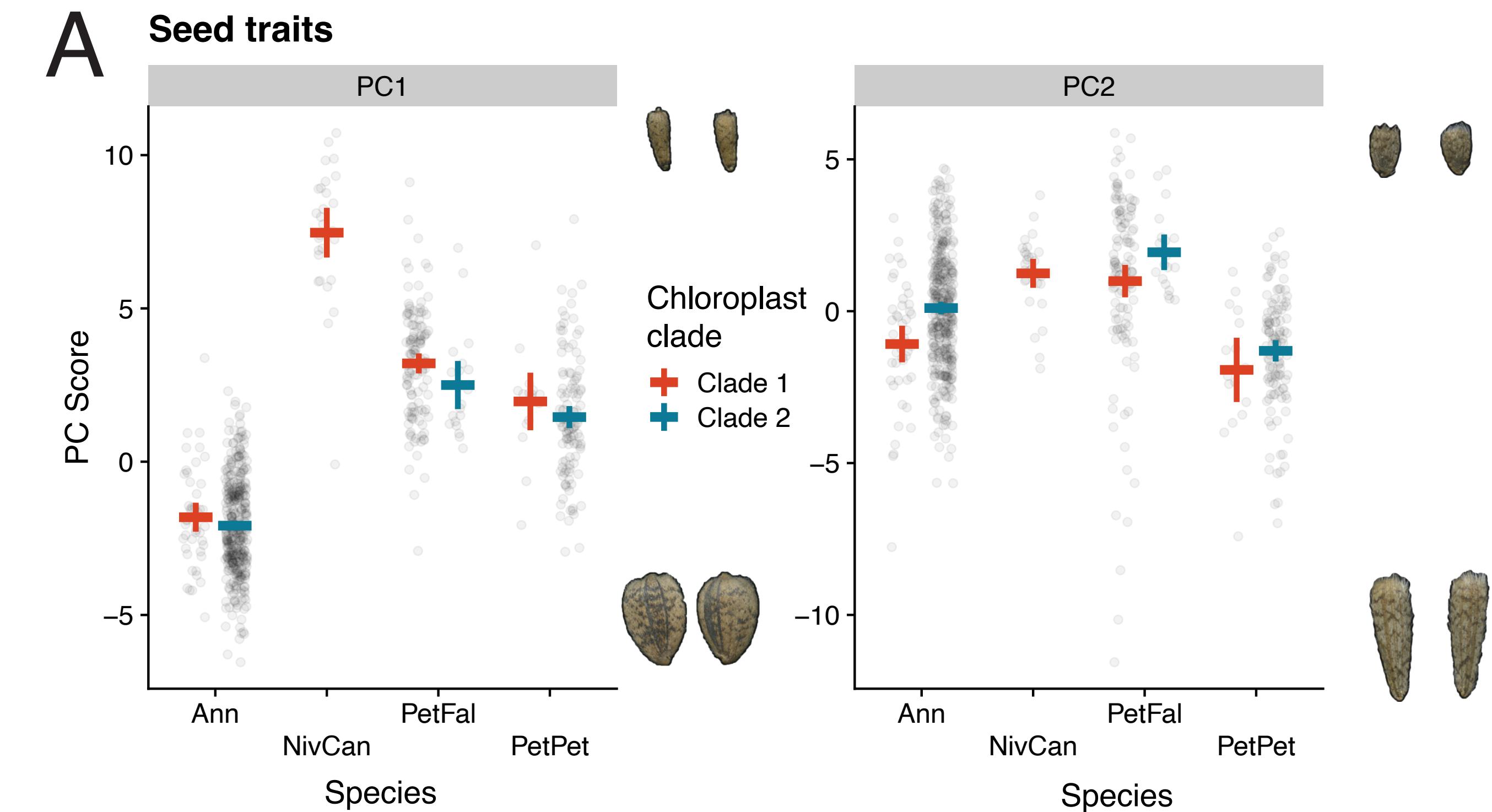
Relative Humidity



Cytoplasm affects seed shape

Trait PC = Species + CP clade

Cytoplasm clade 1 causes seeds to be taller and narrower across and within species.



Why two cytoplasm clades?

**Trans-species balanced polymorphism,
involved in local adaptation and spread by
introgression.**

Thank you!

Co-authors

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- Natalia Bercovich
- Marco Todesco
- Julie A. Lee-Yaw
- Loren H. Rieseberg

