### INVISIBLE UV-ABSORBING FLAVONOIDS ARE PERVASIVE IN

### FLOWERING PLANTS

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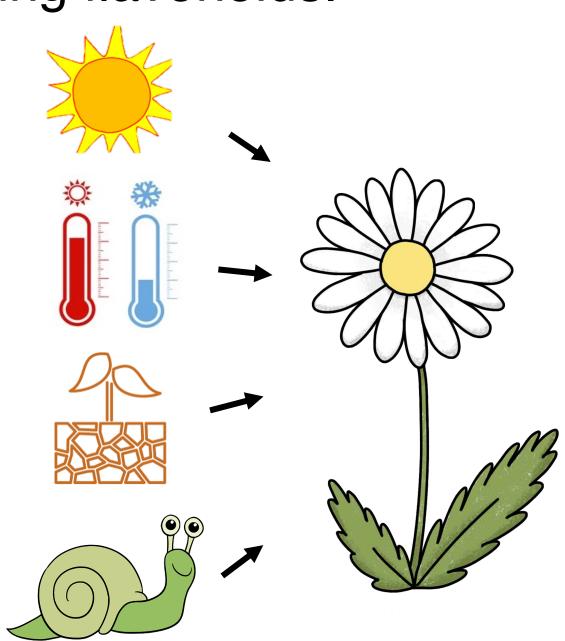






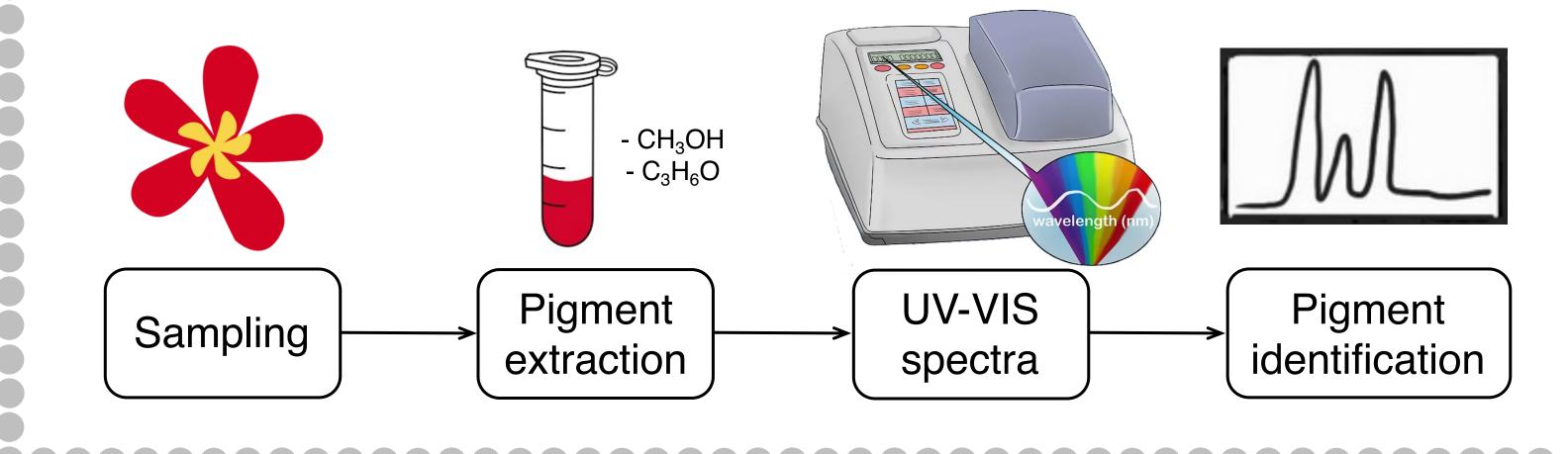
## Flower color and pigments

- Flower color is crucial for pollinator attraction, however abiotic selection agents may drive flower color evolution as well and cause serious negative effects on plant fitness<sup>[1]</sup>.
- The most important groups of floral pigments are: anthocyanins, carotenoids, betalains, chlorophylls, aurones-chalcones, and UV-absorbing flavonoids.
- OUV-absorbing flavonoids, the only group that are invisible for humans, are crucial in pollinator attraction<sup>[2]</sup>. Given their known protective role in vegetative organs<sup>[3]</sup>, they may have a dual role protecting flowers against all sorts of stresses.



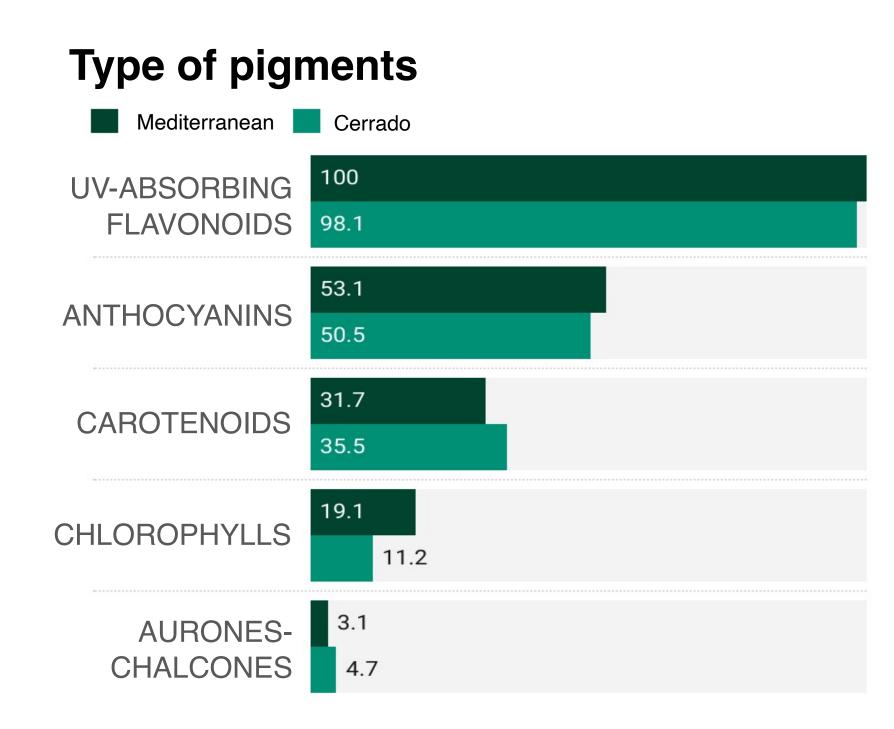
## Sampling and pigment quantification

- We analyzed major floral pigments classes (i.e., chlorophylls, carotenoids, aurones-chalcones, UVabsorbing flavonoids and anthocyanins) for 489 species belonging to 89 angiosperm families from Mediterranean (South Spain) and Cerrado vegetations (Central Brazil).
- (1) We extracted floral pigments, (2) measured the UV-VIS absorption spectra (280-700 nm), and (3) identified mayor pigment classes by means of spectrophotometric analyses.



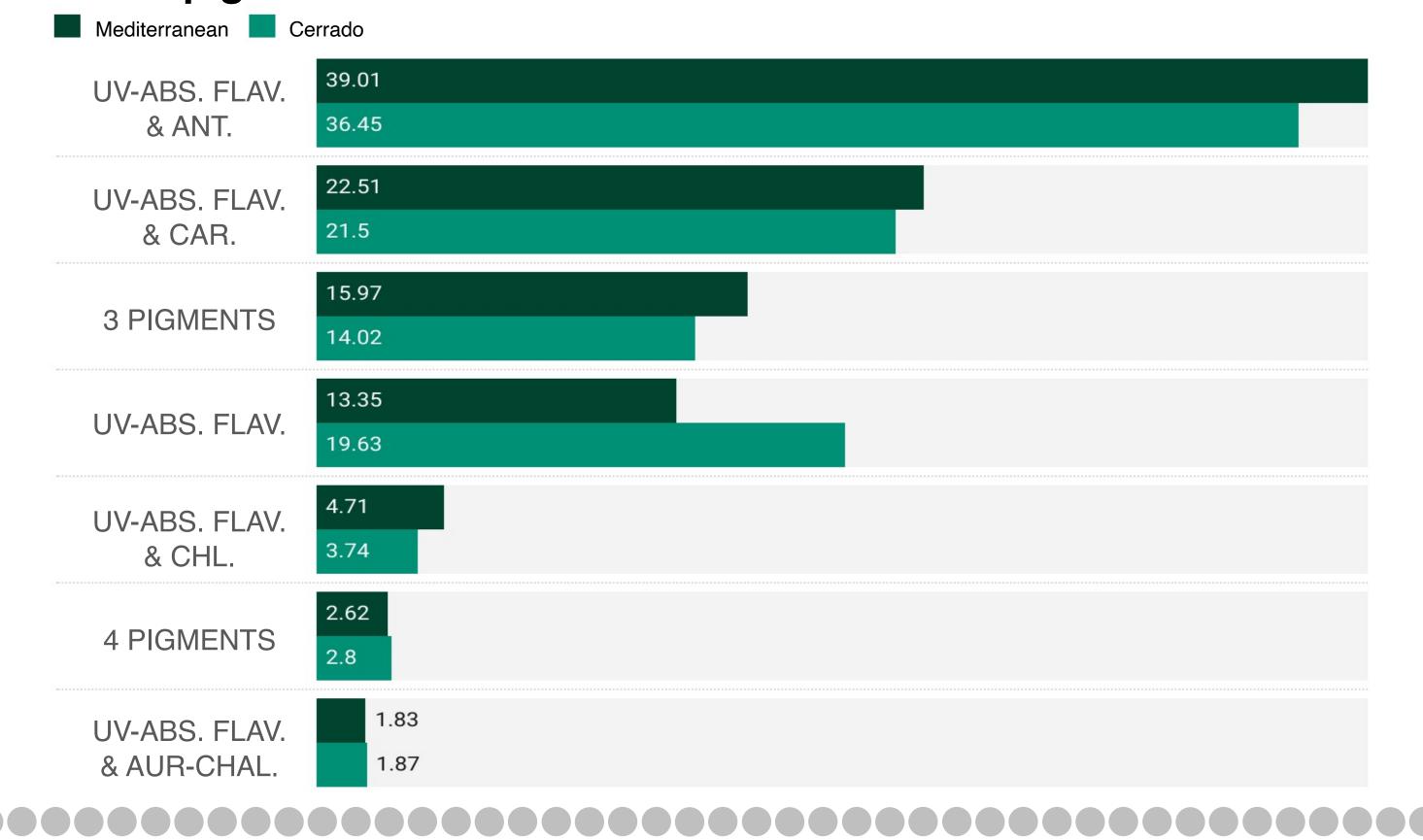
# What we don't see is prevalent

- The frequency of the main groups of floral pigments in Mediterranean and Cerrado flora was similar.
- **UV-absorbing** flavonoids were ubiquitous all They were flowers. exclusively present white-flowered or coexisting plant with floral other pigments.



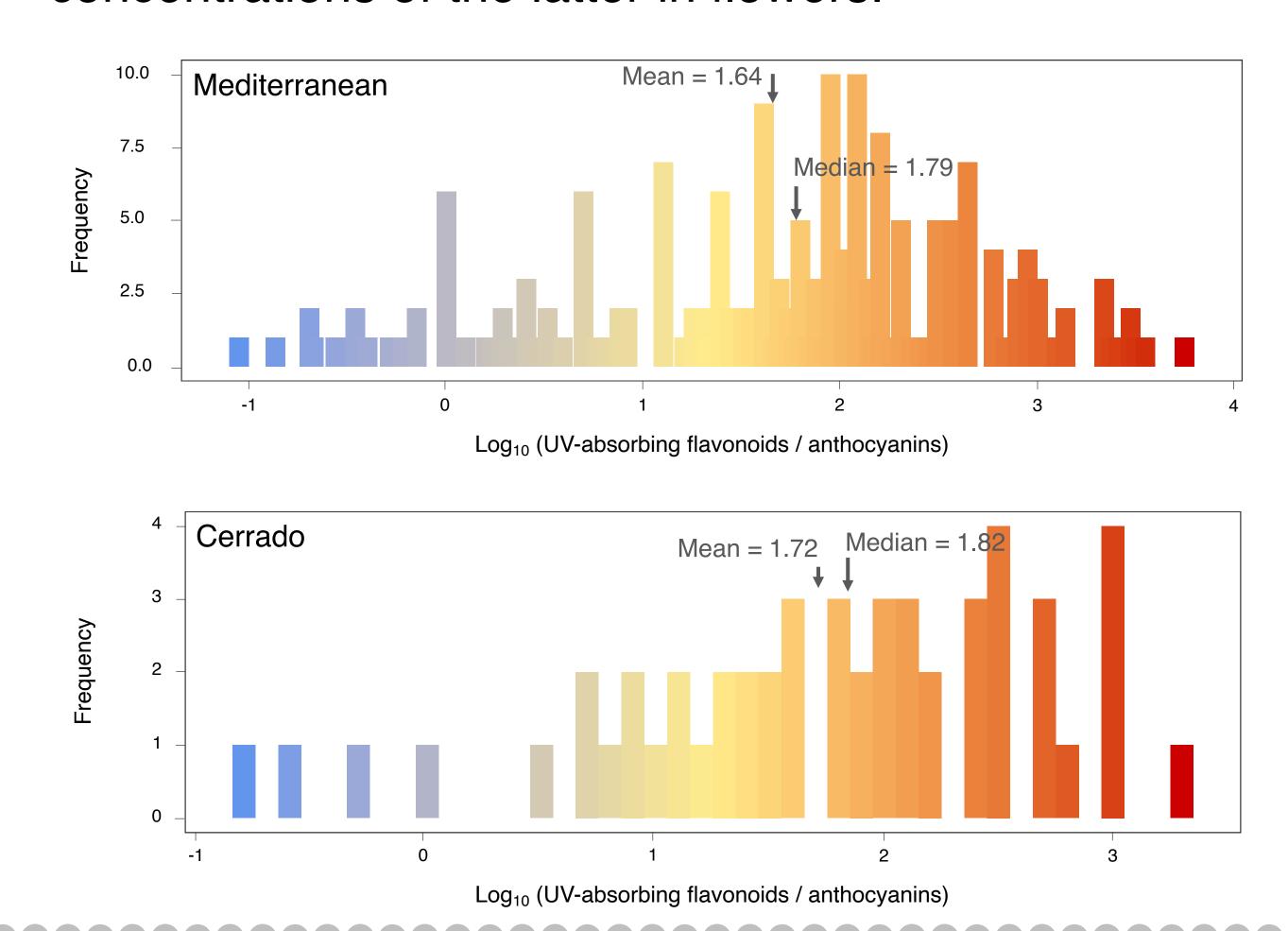
 Most flowers accumulated two pigments, and in all cases was due to the presence of UV-absorbing flavonoids coexisting with any of the other colored pigments.

#### Floral pigment combinations



### Favored accumulation of UV-abs. flavonoids

 The quantification of anthocyanins and UV-absorbing flavonoids, synthesized at different points of the flavonoid metabolic route, showed considerable higher concentrations of the latter in flowers.



#### CONCLUSIONS:

- The widespread concurrence of UV-absorbing flavonoids, regardless of the presence of other pigments, may have adaptive advantages in flowers.
- The high concentration of UV-absorbing flavonoids in flowers of both vegetation types suggests important unsolved roles of these compounds in the evolution of angiosperms.

#### REFERENCES:

