

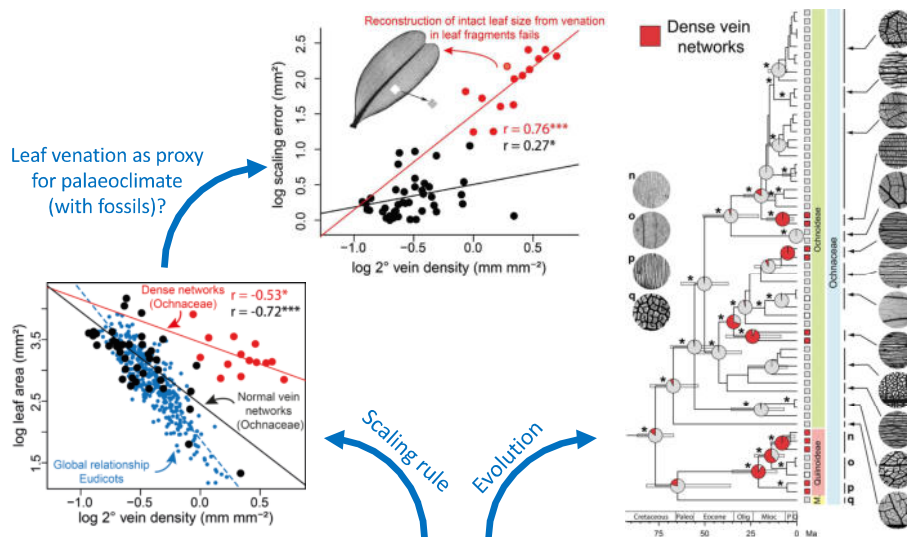
LEAF VENATION NETWORKS THAT CONTRADICT A GLOBAL SCALING RULE

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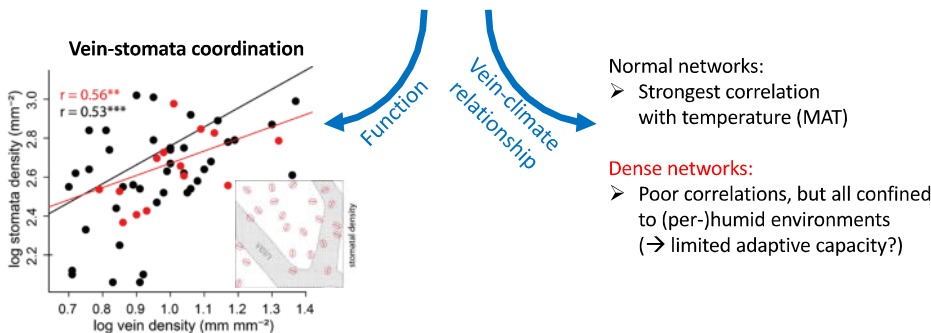
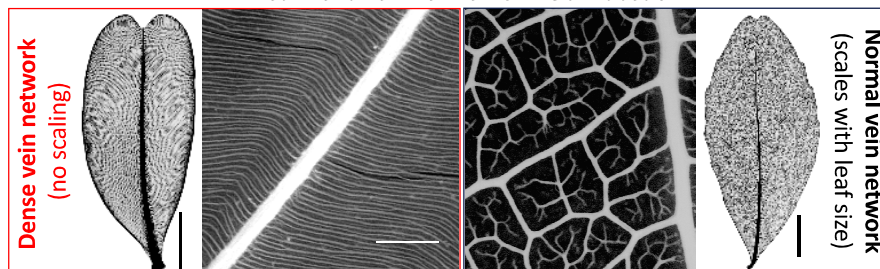
Motivation and Results

Our study seeks to understand scaling relationships of unique leaf venation types, thereby expanding **the general view of vein network organization** in dicotyledonous angiosperms.

- Key discovery: In the tropical **Ochnaceae**, a unique type of leaf venation **violates the global scaling relationship** between major vein density and leaf size (Fig.1)
- These vein networks evolved multiple times independently and are equally functional in terms of hydraulic requirements and construction costs



Leaf venation networks in Ochnaceae

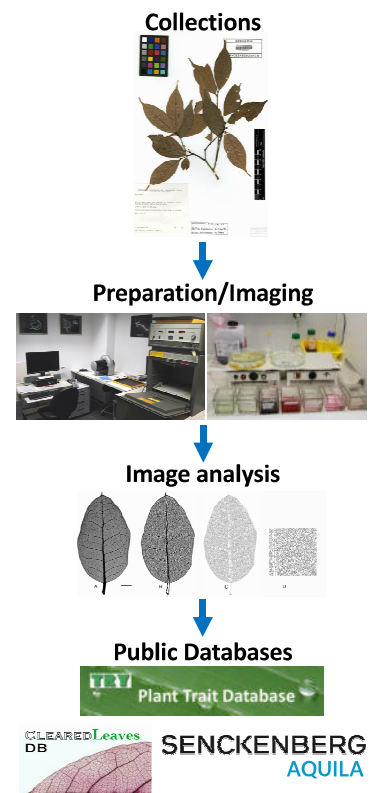


1 Contrasting types of leaf venation in Ochnaceae: their scaling relationships, evolution, functional relationships and adaptive capacity. Scale = 1 cm (whole leaf) or 1 mm (detail).

Contribution to SGN Program Portfolio

- link with RA 1.1 through the integration of data from/in our monographic work
- contributes to program fields **Infrastructure** and **Science and Society** as part of a larger digitization project

See: <http://clearedleavesdb.org/?q=content/senckenberg-herbarium-senckenbergianum-fr-and-glm> (Fig. 2)



2 Pipeline of our **collectomics** approach: leaf venation digitization from herbarium specimens to databases.

Outlook

Further investigation is required to better understand the **genetic basis** of leaf & vein development of the unique vein networks and the **vein-environment relationships**, which provide clues as to how vulnerable species with these vein networks are in view of climate change.

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References

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Schneider JV, Habersetzer J, Rabenstein R, Wesenberg J, Wesche K, Zizka G. 2018. Improved non-destructive 2D and 3D X-ray imaging of leaf venation. *Plant Methods* 14: 7.