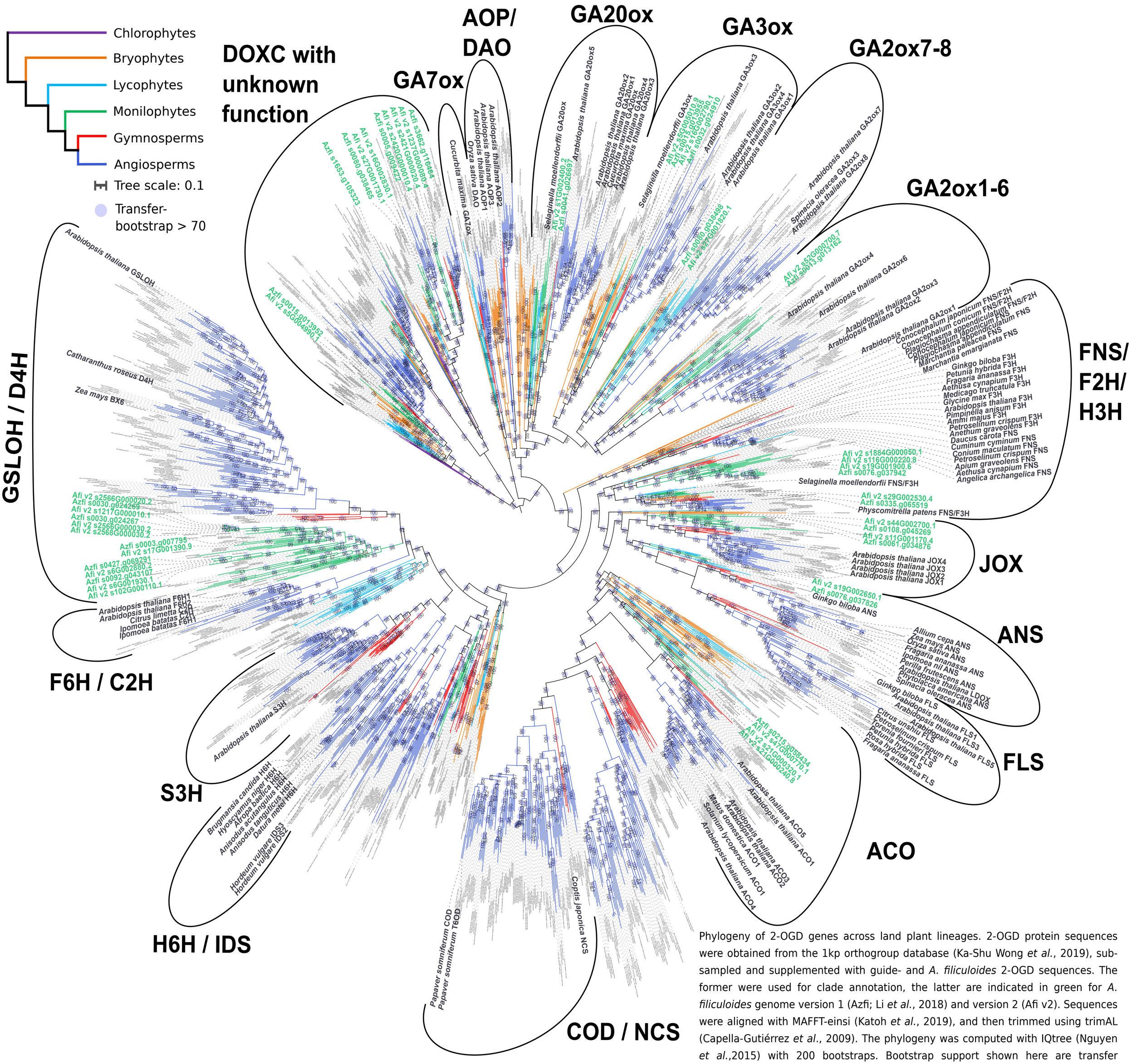

Phylogeny of 2-OGD genes across land plant lineages. 2-OGD protein sequences were obtained from the 1kp orthogroup database (Ka-Shu Wong *et al.*, 2019), sub-sampled and supplemented with guide- and *A. filiculoides* 2-OGD sequences. The former were used for clade annotation, the latter are indicated in green for *A. filiculoides* genome version 1 (Azfi; Li *et al.*, 2018) and version 2 (Afi v2). Sequences were aligned with MAFFT-einsi (Katoh *et al.*, 2019), and then trimmed using trimAL (Capella-Gutiérrez *et al.*, 2009). The phylogeny was computed with IQtree (Nguyen *et al.*,2015) with 200 bootstraps. Bootstrap support shown here are transfer bootstraps (Lemoine *et al*, 2018). The tree was annotated in iTOL (Letunic and Bork, 2019) and Inkscape. All code and data can be found on www.github.com/LauraLWD/2OGD_phylogeny or via DOI: .....