

**Appendix S5: Overview and comparison of results of phyloscan analyses using five distinct phylogenetic backbones (A-E tree series from Sauquet et al., 2017).**

Species	No. of analysed characters (of 30)	No. of most parsimonious (MP/MP+1) positions					Systematic (MP) placement according to this study
		A	B	C	D	E	
<i>Chloranthistemon endressii</i>	12	1/3	1/3	1/3	1/2	1/3	CG Chloranthaceae (Chloranthales)
<i>Dakotanthus cordiformis</i>	29	23/118	12/107	10/124 (incl. SG Rosidae)	18/108	9/108	CG Rosidae (including many MP positions in Fabidae and Malvidae)
<i>Kajanthus lusitanicus</i>	27	11/10	15/8	15/8	15/8	15/8	CG Ranunculales (Eudicotyledoneae), with several MP positions in Lardizabalaceae and Berberidaceae
<i>Mauldinia mirabilis</i>	24	9/13	9/4	9/13	9/4	9/4	CG Laurales (Magnoliidae), with 9 MP positions in the clade with Lauraceae, Hernandiaceae, and Monimiaceae
<i>Microvictoria svitkoana</i>	20	13/7	13/7	13/7	13/7	13/7	12 MP positions in CGs and SGs of the ANA-grade (Amborellales, Nymphaeales, and Austrobaileyales); 1 MP position in CG Calycanthaceae (Laurales, Magnoliidae)

<i>Paleoclusia chevalieri</i>	27	14/16	10/32	17/22	17/25	17/25	CG and SG of the clusioid clade (Malpighiales, Fabidae); 14 MP positions, most in CG Clusiaceae and CG Hypericaceae
<i>Paradinandra suecica</i>	29	21/82	1/26	23/82	1/28	1/28	Numerous MP positions in CG Ericales (Asteridae); additional MP positions in different clades of CG Pentapetalae (e.g., Caryophyllales, Malpighiales, and Dilleniales)
<i>Spanomera mauldinensis</i>	25	4/8	3/2	4/8	3/5	3/3	3 MP positions in CG and SG Buxales and 1 MP position in CG Gunnerales (Eudicotyledoneae)
<i>Tylerianthus crossmanensis</i>	29	1/12	1/12	1/12	1/12	1/12	1 MP position in CG Saxifragaceae (Saxifragales, Superrosidae)
<i>Virginianthus calycanthoides</i>	23	3/18	3/15	3/20	3/15	3/16	3 MP positions in CG and SG Calycanthaceae (Laurales, Magnoliidae)