

Table S1. List and main floristic bioregions of occurrence following as identified by Droissart et al, (2018) for the 30 species used in this study (23 from the Piptostigmaeae and 7 from the Annickieae). Grey highlights strict East African endemic species. All the others are endemics of the Guineo-Congolia region.

Species	Bioregions
<i>Annickia affinis</i>	Lower Guineo-Congolia
<i>Annickia ambigua</i>	Guineo-Congolian
<i>Annickia chlorantha</i>	Guineo-Congolian
<i>Annickia kummerae</i>	Swahilian coastal
<i>Annickia le testui</i>	Lower Guinea
<i>Annickia pilosa</i>	Lower Guinea
<i>Annickia polycarpa</i>	Upper Guinea
<i>Brieya fasciculata</i>	Guineo-Congolian
<i>Greenwayodendron gabonicum</i>	Lower Guinea
<i>Greenwayodendron glabrum</i>	Lower Guinea
<i>Greenwayodendron litorale</i>	Lower Guinea
<i>Greenwayodendron oliveri</i>	Upper Guinea
<i>Greenwayodendron suaveolens</i>	Lower Guineo-Congolia
<i>Greenwayodendron usambaricum</i>	Swahilian coastal
<i>Mwasumbia alba</i>	Swahilian coastal
<i>Piptostigma calophyllum</i>	Lower Guinea
<i>Piptostigma cf. mayndongtsaeum</i>	Lower Guinea
<i>Piptostigma goslineanum</i>	Lower Guinea
<i>Piptostigma macranthum</i>	Lower Guinea
<i>Piptostigma macrophyllum</i>	Lower Guinea
<i>Piptostigma mortehanii</i>	Lower Guineo-Congolia
<i>Piptostigma multinervium</i>	Lower Guinea
<i>Piptostigma oyemense</i>	Lower Guinea
<i>Piptostigma pilosum</i>	Lower Guinea
<i>Piptostigma sp.</i>	Lower Guinea
<i>Piptostigma submontanum</i>	Lower Guinea
<i>Polyceratocarpus microtrichus</i>	Lower Guinea
<i>Polyceratocarpus parviflorus</i>	Lower Guineo-Congolia
<i>Polyceratocarpus pelligrinii</i>	Lower Guinea
<i>Sirdavidia solanona</i>	Lower Guinea

Table S2. Specimen information used for this study with associated sequencing statistics. Total reads: Total number of reads recovered for each barcoded tag; mapped reads: number of reads mapped to reference exonic sequences; % enrichment: percentage of reads correctly mapped to reference exonic sequences. 10x coverage: proportion of the reference sequences covered with at least 10 base pairs; mean depth: average number of reads covering reference sequences.

Subfamily	Tribe	Species	Collector	Collector number	Country	Total reads	Mapped	% enrichment	10x coverage	mean depth
Malmeoideae	Annickieae	<i>Annickia affinis</i>	Couvreur, T.L.P.	519	Cameroon	1000730	463023	46	0.67	83.3
Malmeoideae	Annickieae	<i>Annickia ambigua</i>	Couvreur, T.L.P.	788	Republic of Congo	4384950	1747534	40	0.91	530.4
Malmeoideae	Annickieae	<i>Annickia chlorantha</i>	Couvreur, T.L.P.	414	Cameroon	4439712	1766979	40	0.90	373.0
Malmeoideae	Annickieae	<i>Annickia kummerae</i>	Couvreur, T.L.P.	16	Tanzania	3694302	1721036	47	0.92	521.4
Malmeoideae	Annickieae	<i>Annickia le testui</i>	Wieringa, J.J.	6369	Gabon	3328802	1380884	41	0.90	418.0
Malmeoideae	Annickieae	<i>Annickia pilosa</i>	Couvreur, T.L.P.	859	Gabon	4166170	1716857	41	0.91	521.9
Malmeoideae	Annickieae	<i>Annickia polycarpa</i>	Jongkind, C.C.H.	10892	Gabon	4482548	1721966	38	0.91	522.0
Malmeoideae	Piptostigmateae	<i>Brieya fasciculata</i>	Couvreur, T.L.P.	578	Gabon	5169906	1570004	30	0.91	456.8
Malmeoideae	Piptostigmateae	<i>Greenwayodendron gabonicum</i>	Wieringa, J.J.	8417	Gabon	5000256	1875494	38	0.91	551.3
Malmeoideae	Piptostigmateae	<i>Greenwayodendron glabrum</i>	Lissambou, B.J.	1745	Cameroon	5874848	2431999	41	0.91	726.9
Malmeoideae	Piptostigmateae	<i>Greenwayodendron litorale</i>	Wieringa, J.J.	8490	Gabon	5393460	2034896	38	0.92	614.9
Malmeoideae	Piptostigmateae	<i>Greenwayodendron oliveri</i>	Fofana, F.	120	Guinea Conakry	3981396	1303033	33	0.89	376.3
Malmeoideae	Piptostigmateae	<i>Greenwayodendron suaveolens</i>	Couvreur, T.L.P.	746	Gabon	3033312	1256624	41	0.91	536.4
Malmeoideae	Piptostigmateae	<i>Greenwayodendron usambaricum</i>	Johnson, D.	1943	Tanzanie	1531392	677192	44	0.87	198.9
Malmeoideae	Piptostigmateae	<i>Mwasumbia alba</i>	Couvreur, T.L.P.	75	Tanzania	3669564	1215821	33	0.90	365.4
Malmeoideae	Piptostigmateae	<i>Piptostigma calophyllum</i>	Ghogue, J.P.	3000	Cameroon	3823320	1106504	29	0.90	324.9
Malmeoideae	Piptostigmateae	<i>Piptostigma cf. mayndongtsae anum</i>	Couvreur, T.L.P.	672	Cameroon	2357088	672009	29	0.88	196.2
Malmeoideae	Piptostigmateae	<i>Piptostigma goslineanum</i>	Couvreur, T.L.P.	1030	Cameroon	3591846	909422	25	0.90	270.1
Malmeoideae	Piptostigmateae	<i>Piptostigma macranthum</i>	Couvreur, T.L.P.	1135	Gabon	2780578	730606	26	0.89	216.6
Malmeoideae	Piptostigmateae	<i>Piptostigma macrophyllum</i>	Couvreur, T.L.P.	1034	Cameroon	2913116	801176	28	0.89	237.2
Malmeoideae	Piptostigmateae	<i>Piptostigma mortehanii</i>	Couvreur, T.L.P.	667	Cameroon	3766478	1159406	31	0.90	333.5
Malmeoideae	Piptostigmateae	<i>Piptostigma multinervium</i>	Couvreur, T.L.P.	616	Cameroon	3056936	835291	27	0.89	247.4
Malmeoideae	Piptostigmateae	<i>Piptostigma oyemense</i>	Couvreur, T.L.P.	917	Gabon	2891216	861801	30	0.89	253.0
Malmeoideae	Piptostigmateae	<i>Piptostigma pilosum</i>	Couvreur, T.L.P.	1103	Gabon	3289272	832337	25	0.90	247.3

Malmeoideae	Piptostigmateae	<i>Piptostigma sp.</i>	Couvreur, T.L.P.	693	Cameroon	3479282	985769	28	0.90	289.9
Malmeoideae	Piptostigmateae	<i>Piptostigma submontanum</i>	Couvreur, T.L.P.	625	Cameroon	2762948	794248	29	0.89	231.2
Malmeoideae	Piptostigmateae	<i>Polyceratocarpus microtrichus</i>	Droissart, V.	1881	Cameroon	3390254	891160	26	0.90	268.2
Malmeoideae	Piptostigmateae	<i>Polyceratocarpus parviflorus</i>	Couvreur, T.L.P.	1036	Cameroon	5016724	1203608	24	0.91	362.9
Malmeoideae	Piptostigmateae	<i>Polyceratocarpus pelligrinii</i>	Couvreur, T.L.P.	575	Gabon	3406604	944840	28	0.90	281.2
Malmeoideae	Piptostigmateae	<i>Sirdavidia solannona</i>	Couvreur, T.L.P.	1127	Gabon	4135966	1090730	26	0.91	328.4
Ambavioideae		<i>Cleistopholis staudii</i>	Couvreur, T.L.P.	570	Gabon	1790158	402150	22	0.82	119.7
Ambavioideae		<i>Drepananthus ramuliflorus</i>	Sauquet, H.	167	Malaysia	2676926	150278	6	0.66	45.1
Ambavioideae		<i>Meiocarpidium olivieranum</i>	Couvreur, T.L.P.	920	Gabon	3950072	343879	9	0.80	104.3
Anaxagoreoideae		<i>Anaxagorea crassipetala</i>	Maas, P.J.M.	9408	Costa Rica	2648398	256748	10	0.67	76.9
Annonoideae	Annoneae	<i>Anonidium mannii</i>	Couvreur, T.L.P.	1053	Cameroon	1613002	679049	42	0.89	206.9
Annonoideae	Annoneae	<i>Goniothalamus borneensis</i>	Onstein, R.E.	52	Malaysia	3491432	444488	13	0.80	137.9
Annonoideae	Bocageae	<i>Mkilua fragrans</i>	Couvreur, T.L.P.	25	Tanzania	5046552	1323802	26	0.84	411.0
Annonoideae	Duguetieae	<i>Duguetia staudtii</i>	Couvreur, T.L.P.	1014	Cameroon	2854728	440393	15	0.83	130.7
Annonoideae	Guatterieae	<i>Guatteria jefensis</i>	Maas, P.J.M.	9553	Panama	2703408	538079	20	0.85	164.2
Annonoideae	Monodoreae	<i>Monodora myristica</i>	Couvreur, T.L.P.	1031	Cameroon	710030	278735	39	0.55	68.2
Annonoideae	Monodoreae	<i>Uvariiodendron molundense var. citrata</i>	Sosef, M.S.M.	2219	Gabon	3437590	609089	18	0.84	186.5
Annonoideae	Uvariaeae	<i>Friesodielsia excisa</i>	Sauquet, H.	177	Malaysia	4341290	593246	14	0.83	182.9
Annonoideae	Uvariaeae	<i>Uvaria grandiflora</i>	Couvreur, T.L.P.	838	Malaysia	4284414	608782	14	0.84	188.0
Annonoideae	Xylopieae	<i>Xylopia hypolampra</i>	Couvreur, T.L.P.	420	Cameroon	5301288	3465910	65	0.92	606.3
Malmeoideae	Bocageae	<i>Trigynaea sp.</i>	Pirie, M.D.	97	Peru	2762520	341497	12	0.75	102.1
Malmeoideae	Malmeeae	<i>Crematosperma oblongum</i>	Pirie, M.D.	7	Peru	2877928	442261	15	0.81	131.9
Malmeoideae	Malmeeae	<i>Klarobelia candida</i>	Chatrou, L.W.	124	Peru	3361894	568134	17	0.82	170.7
Malmeoideae	Malmeeae	<i>Mosannona vasquezii</i>	Chatrou, L.W.	226	Peru	3949068	519413	13	0.81	154.6
Malmeoideae	Malmeeae	<i>Onychopetalum periquino</i>	Chatrou, L.W.	439	Bolivia	3082266	679271	22	0.84	204.8
Malmeoideae	Miliuseae	<i>Alphonsea kinabaluensis</i>	Couvreur, T.L.P.	820	Malaysia	3742072	490513	13	0.80	149.6
Malmeoideae	Miliuseae	<i>Monoon erianthoides</i>	Couvreur, T.L.P.	835	Malaysia	4289432	672068	16	0.83	207.4
Malmeoideae	Miliuseae	<i>Neo-uvaria acuminatissima</i>	Sauquet, H.	186	Malaysia	3551840	587049	17	0.82	178.9
Malmeoideae	Miliuseae	<i>Popowia alata</i>	Sauquet, H.	180	Malaysia	3491736	506710	15	0.82	151.2

Table S3. Table listing the 32 selected exons and introns chosen for the BEAST analysis with their length, their best nucleotide substitution models selected with the BIC criterion and their tree length with root-to-tip variance.

Exons/Intron number	Length (bp)	Substitution models	Tree length (substitution per site)	Root-to-tip variance
DN218_217_Q8W4D1	514	K80+G4	0.762829	0.000163612
DN1788_403_Q9LU59	701	K80+I+G4	1.05842	0.000150531
DN13780_2654_Q43316	903	HKY+I+G4	0.887329	0.000107929
DN19980_42874_Q9SSQ9	458	K80+G4	0.767042	0.000195025
DN26939_9475_Q8RYD9	476	HKY+G4	0.795664	0.000131686
DN31878_20716_Q8S8N6	729	K80+G4	1.19608	0.000188825
DN33949_31556_Q94KK5	1161	K80+I+G4	1.15389	0.000158169
DN34518_35383_Q9LX10	1836	HKY+I+G4	0.780188	0.00011528
DN34532_35505_Q9LTS7	957	HKY+G4	1.13148	0.000185411
DN34813_37580_Q9T0B3	321	K80+I	0.564146	0.000196044
DN34827_37789_Q48696	413	K80+G4	0.834024	0.000112466
DN36165_49965_nomatch	318	K80+G4	0.726079	0.000159599
DN36459_53458_Q9M090	1650	HKY+G4	0.932297	0.000140564
DN36680_55982_Q9SD21	1174	GTR+G4	1.02163	0.000125339
DN37740_71419_Q8RWR3	1971	GTR+I+G4	1.06041	0.000191506
DN37836_73016_Q9FF52	501	K80+G4	0.64422	0.000172329
DN37839_73021_Q9LNG5	378	K80+I+G4	0.510149	0.000123993
DN70624_112688_Q82484	309	K80+G4	0.781348	0.000160092
DN74895_124004_Q8S8M1	411	K80+I+G4	0.850896	0.000170538
DN74895_124004_Q8S8M1_introns	677	HKY+I+G4	0.6982	0.000112563
DN74970_125072_Q9SJ66	1275	HKY+I+G4	0.937	0.000197576
DN76933_47540_Q23315	372	K80+G4	0.917007	0.000188461
DN77328_49269_Q84WS4	354	HKY+G4	0.867191	0.000191955
DN77862_53511_Q9LQ26	318	K80+G4	0.843178	0.000198356
DN78930_137771_Q8RY25	333	HKY+G4	0.870617	0.000139845
DN79594_140275_P92996	1380	HKY+G4	1.26947	0.000157992
DN79971_143901_Q9LJA3	336	K80+G4	0.633663	0.000114691
DN80397_69352_Q9FKN9	333	HKY+G4	0.606325	0.000138192
DN80727_146980_nomatch	273	K80+G4	0.510226	0.000107148
DN81339_74506_Q8L4J2	534	K80+G4	0.678336	0.000114913
DN81890_78861_Q84LG4	315	K80+G4	0.95549	0.000156493
DN81922_156171_Q04648	330	K80+G4	0.827368	0.000197271

Table S4. Age estimate of the extant taxa for the six Piptostigmateae genera and *Annickia* using BEAST. The crown node estimation of *Brieya* was not possible because we didn't include the second species of this genus. *In the case of *Mwasumbia* and *Sirdavidia*, both monotypic genera, we report the stem age.

Piptostigmateae genera	Species samples/Total extant species	Crown node mean age estimation [95% HPD] (Myr)
<i>Annickia</i>	7/8	5.363 [4.361 - 6.171]
<i>Brieya</i>	1/2	-
<i>Greenwayodendron</i>	6/6	6.790 [5.708 - 7.789]
<i>Mwasumbia</i>	1/1	16.13 [13.89 - 18.18]*
<i>Piptostigma</i>	11/13	3.99 [3.421 - 4.601]
<i>Polyceratocarpus</i>	3/8	5.031 [4.088 - 5.886]
<i>Sirdavidia</i>	1/1	16.13 [13.89 - 18.18]*

Table S5 Results of the TESS analysis. ESS for all MCMC where above 300 except for the Exponential λ / exponential μ model (less than 100). Abbreviations: λ : speciation; μ : extinction; λ_0 : estimated speciation at present; α : rate of change of speciation; μ_0 : estimated extinction at present; β : rate of change of speciation rate (from the present to the past).

Models	Marginal Likelihood	λ	α	μ	β
Exponential λ (no μ)	-68.0830	0.041 $\pm$ 0.027	0.054 $\pm$ 0.027	-	-
Exponential λ / constant μ	-68.1605	0.041 $\pm$ 0.022	0.071 $\pm$ 0.055	0.070 $\pm$ 0.043	-
Constant λ / constant μ	-68.9189	0.177 $\pm$ 0.051	-	0.104 $\pm$ 0.068	-
Constant λ (no μ)	-69.7957	0.128 $\pm$ 0.025	-	-	-
Constant λ / exponential μ	-70.2824	0.174 $\pm$ 0.050	-	0.068 $\pm$ 0.055	0.021 $\pm$ 0.002
Exponential λ / exponential μ	no convergence	-	-	-	-

Table S6 Output of the computeBayesFactors command from BAMMtools. Bayes Factors values for the model with k shifts relative to the model with 0 rate shifts.

Shifts	Bayes Factors
0	1
1	0.34027397
2	0.16767123
3	0.10958904

Table S7 Results of the Nested Sampling model selection.

Models	Maximum Likelihood
Yule (lognormal clock)	-144408.289
Birth-Death (lognormal clock)	-152829.082
Yule (strict clock)	-160607.534
Birth-Death (strict clock)	-186314.490