

**Table S2**

Level of phylome support for each possible topological arrangement of the nodes represented in the different species trees. For each node, the species represented by each of the three or four groups considered are indicated. Then, all possible topological arrangements of these groups (three possibilities for three groups and 15 for four groups) and the percentage of trees in the phylome that support that topology are indicated. The specific topology obtained in the species tree is shadowed and the most supported topology in the phylome is highlighted in red.

Supplementary table 2  
(1 of 6)

T60 phylome:

<i>Topologies 3</i>	((A,B),C)	((A,C),B)	((B,C),A)	<i>Topologies 3</i>	((A,B),C)	((A,C),B)	((B,C),A)
A=Cal B=Cdu C=Ctr	97,76	0,95	1,29	A=Cgo-Pan B=Ncr C=Mgr	84,5	7,91	7,59
A=Cal-Cdu B=Ctr C=Lel	90,9	4,68	4,42	A=Ror B=Pbl C=Bde	97,79	1	1,2
A=Cal-Cdu-Ctr B=Lel c=Pst	91	5,16	3,84	A=Spb B=Sja C=Pca	97,97	0,74	1,29
A=Cal-Cdu-Ctr-Lel B=Pst C=Dha	60,31	6,89	32,8	A=Aor B=Afl C=Ate	99,25	0,45	0,3
A=Cal-Cdu-Ctr-Lel-Pst B=Dha C=Cgu	37,31	13,68	49,01	A=Aor-Afl B=Ate C=Ang	47,94	27,33	24,73
A=Cal-Cdu-Ctr-Lel-Pst-Dha B=Cgu C=Clu	44,38	25,54	30,07	A=Aor-Afl-Ate B=Ang C=Ani	32,65	25,94	41,41
A=Fox B=Fve C=Gze	93,33	3,22	3,45	A=Scce B=Spa C=Smi	84,01	7,36	8,63
A=Fox-Fve B=Gze C=Nha	88,34	5,91	5,75	A=Scce-Spa B=Smi C=Sku	72,83	11,88	11,88
A=Fox-Fve-Gze B=Nha C=Tre	94,92	1,41	3,67	A=Scce-Spa-Smi B=Sku C=Sba	52,93	15,68	31,39
A=Lbi-Cci B=Pch-Ppl C=Cne	97,41	1,53	1,06	A=Scce-Spa-Smi-Sku B=Sba C=Sca	99	0,09	0,91
A=Lbi-Cci-Pch-Ppl B=Cne C=Uma	64,36	14,23	21,41	A=Scce-Spa-Smi-Sku-Sba B=Sca C=Cgl	36,35	35,73	27,92
A=Afu B=Nfi C=Acl	96,72	1,5	1,78	A=Scce-Spa-Smi-Sku-Sba-Sca B=Cgl C=Kpo	46,08	24,09	29,84
A=Ure B=Cim C=Hea	97,94	1,3	0,75	A=Scce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo-Ago-Kla-Kwa-Skl B=Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu-Clu C=Yli	90,08	3,59	6,33
A=Cgo B=Pan C=Ncr	66,92	15,39	17,7				

Supplementary table 2 (2 of 6)

Topologies 4	((A,B),C),D	((A,B),D),C	((A,C),B),D	((A,C),D),B	((A,D),B),C	((A,D),C),B	((B,C),A),D	((B,C),D),A	((B,D),A),C	((B,D),C),A	((C,D),A),B	((C,D),B),A	((A,B),(C,D))	((A,C),(B,D))	((A,D),(B,C))
A=Fox-Fve-Gze-Nha B=Tre C=Mgr D=Ncr-Cgo-Pan	18,29	18,03	0,14	0,35	0,31	0,07	0,7	0,47	0,54	0,31	1,18	0,83	58,28	0,23	0,29
A=Fox-Fve-Gze-Nha-Tre B=Mgr-Ncr-Cgo-Pan C=Bci D=Ssc	0	0	0	0	0	0	0	0	0	0	4,72	5,8	89,48	0	0
A=Lbi B=Cci C=Pch D=Ppl	7,08	14,32	0,63	0,75	1,03	0,72	0,1	0,38	0,94	0,17	9,73	2,65	60,98	0,22	0,3
A=Lbi-Cci-Pch-Ppl-Cne B=Uua C=Sro D=Pgr	2,97	1,91	2,55	2,05	1,02	1,26	3,47	4,13	1,46	3,71	20,19	22,27	28,16	2,33	2,52
A=Ago B=Kla C=Kva D=SkI	7,52	10,64	1,72	4,56	1,77	5,03	1,31	3,04	2,04	2,85	10,61	7,55	36,33	2,4	2,63
A=Aor-Afl-Ate-Ang B=Ani C=Acl D=Afu-Nfi	1,82	1,75	0,35	1,54	0,14	1,01	0,27	1	0,53	0,76	48,3	15,05	26,86	0,56	0,05
A=Aor-Afl-Ate-Ang-Ani B=Acl-Afu-Nfi C=Hca D=Cim-Ure	9,36	8,22	0	0	0	0,29	0,15	0	0	0,15	1,46	1,1	79,28	0	0
A=Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi B=Hca-Cim-Ure C=Sno D=Mfi	10,07	8,98	0,13	0,03	0,39	0	0,46	0	0,07	0,13	0,85	0,72	78,04	0,13	0
A=Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi-Hca-Cim-Ure B=Sno-Mfi C=Bci-Ssc D=Mgr-Ncr-Cgo-Pan-Tre-Gze-Fox-Fve-Nha	6,74	1,09	2,26	1,72	0,47	1	2,78	2,88	0,49	1,46	21,84	23,97	31,17	1,32	0,81
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl B=Kpo C=Ago-Kla D=Kva-Skl	8,96	18,14	0,2	0,36	0,85	0,76	1,16	0,78	1,14	0,83	5,27	4,77	55,78	0,48	0,53
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo B=Ago-Kla-Kva-Skl C=Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu D=Clu	0,21	0,58	0	0	0	0	0	0,1	0	0	0	0,14	98,97	0	0,07
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo-Ago-Kla-Kva-Skl-Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu-Clu B=Yli C=Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi-Hca-Cim-Ure-Sno-Mfi D=Bci-Ssc-Mgr-Ncr-Cgo-Pan-Tre-Gze-Fox-Fve-Nha	0,17	0,34	0	0	0	0	0,04	0,22	0,07	0	1,69	3,67	93,71	0	0,07
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo-Ago-Kla-Kva-Skl-Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu-Clu-Yli B=Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi-Hca-Cim-Ure-Sno-Mfi-Bci-Ssc-Mgr-Ncr-Cgo-Pan-Tre-Gze-Fox-Fve-Nha C=Sja-Spb D=Pca	8,27	9,6	6,06	2,91	4,11	1,29	2,39	0,86	5,01	3,63	7,21	8,55	34	4,68	1,43
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo-Ago-Kla-Kva-Skl-Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu-Clu-Yli-Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi-Hca-Cim-Ure-Sno-Mfi-Bci-Ssc-Mgr-Ncr-Cgo-Pan-Tre-Gze-Fox-Fve-Nha B=Sja-Spb-Pca C=Cci-Lbi-Pch-Ppl-Cne-Sro-Pgr D=Uma	1,08	1,15	0	0,29	0,59	0,44	0,07	0,59	0,49	0,29	3,46	2,8	88,73	0	0
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo-Ago-Kla-Kva-Skl-Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu-Clu-Yli-Aor-Afl-Ate-Ang-Ani-Acl-Afu-Nfi-Hca-Cim-Ure-Sno-Mfi-Bci-Ssc-Mgr-Ncr-Cgo-Pan-Tre-Gze-Fox-Fve-Nha-Sja-Spb-Pca B=Cci-Lbi-Pch-Ppl-Cne-Sro-Pgr-Uma C=Bde D=Pbl-Ror	5,01	28,37	1,23	1,24	3,04	0,99	1,44	1,89	6,51	4,47	5,35	16,23	22,16	0,86	1,2

Supplementary table 2 (3 of 6)

T21 phylome

<i>Topologies 3</i>	((A,B),C)	((A,C),B)	((B,C),A)
A=Cal B=Cdu C=Ctr	97,69	0,89	1,43
A=Cal-Cdu B=Ctr C=Lel	89,91	5,12	4,98
A=Cal-Cdu-Ctr B=Lel C=Pst	90,02	5,88	4,11
A=Cal-Cdu-Ctr-Lel-Pst B=Dha-Cgu C=Clu	50,10	17,27	32,63
A=Sce B=Spa C=Smi	84,38	7,42	8,20
A=Sce-Spa B=Smi C=Skv	72,48	12,04	15,48
A=Sce-Spa-Smi B=Skv C=Sba	52,62	15,32	32,07
A=Sce-Spa-Smi-Skv B=Sba C=Sca	99,28	0,46	0,26
A=Sce-Spa-Smi-Skv-Sba B=Sca C=Cgl	34,90	36,24	28,87
A=Sce-Spa-Smi-Skv-Sba-Sca B=Cgl C=Kpo	52,66	24,67	22,66

Supplementary table 2 (4 of 6)

<i>Topologies 4</i>	((A,B),C),D)	((A,B),D),C)	((A,C),B),D)	((A,C),D),B)	((A,D),B),C)	((A,D),C),B)	((B,C),A),D)	((B,C),D),A)	((B,D),A),C)	((B,D),C),A)	((C,D),A),B)	((C,D),B),A)	((A,B),(C,D))	((A,C),(B,D))	((A,D),(B,C))
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl B=Kpo C=Ago-Kla D=Kwa-Skl	8,70	17,86	0,53	0,33	0,80	0,62	0,61	0,76	0,69	0,58	7,20	5,32	54,70	0,87	0,44
A=Sce-Spa-Smi-Sku-Sba-Sca-Cgl-Kpo B=Ago-Kla-Kwa-Skl C=Cal-Cdu-Ctr-Lel-Pst-Dha-Cgu D=Clu	1,89	1,50	0,00	0,00	0,17	0,00	0,06	0,00	0,52	0,00	1,29	1,37	92,86	0,17	0,17
A=Ago B=Kla C=Kwa D=Skl	9,29	12,46	2,74	4,88	1,99	4,64	2,05	3,61	2,26	2,06	5,13	6,85	36,05	2,71	3,28
A=Cal-Cdu-Ctr-Lel B=Pst C=Dha D=Cgu	23,75	7,98	2,03	0,38	1,06	0,84	7,46	7,55	0,90	2,67	3,38	14,22	24,74	0,46	2,60

Supplementary table 2 (5 of 6)

## T12a phylome

<i>Topologies 3</i>	((A,B),C)	((A,C),B)	((B,C),A)
A=Sce B=Spa C=Smi	84,58	7,21	8,21
A=Sce-Spa B=Smi C=Skv	72,89	12,13	14,98
A=Sce-Spa-Smi B=Skv C=Sba	52,86	14,98	32,15
A=Sce-Spa-Smi-Skv B=Sba C=Sca	98,96	0,65	0,66
A=Sce-Spa-Smi-Skv-Sba B=Sca C=Cgl	35,12	36,61	28,27
A=Sce-Spa-Smi-Skv-Sba-Sca B=Cgl C=Kpo	49,99	23,05	26,95

<i>Topologies 4</i>	((A,B),C),D)	((A,B),D),C)	((A,C),B),D)	((A,C),D),B)	((A,D),B),C)	((A,D),C),B)	((B,C),A),D)	((B,C),D),A)	((B,D),A),C)	((B,D),C),A)	((C,D),A),B)	((C,D),B),A)	((A,B),(C,D))	((A,C),(B,D))	((A,D),(B,C))
A=Ago B=Kla C=Kwa D=SkI	9,15	10,86	2,28	5,73	1,91	5,19	0,87	3,62	2,08	2,28	9,91	5,06	35,85	2,53	2,69

Supplementary table 2 (6 of 6)

## T12b phylome

<i>Topologies 3</i>	((A,B),C)	((A,C),B)	((B,C),A)
A=Ago B=Cal C=Scce	1,58	96,52	1,9
A=Scce-Ago B=Cal C=Yli	87,14	4,5	8,36
A=Scce-Ago-Cal-Yli B=Bci-Ncr-Sno-Ani C=Spb	50,41	26,13	23,46
A=Scce-Ago-Cal-Yli-Bci-Ncr-Sno-Ani B=Spb C=Cne	60,02	21,29	48,69
A=Scce-Ago-Cal-Yli-Bci-Ncr-Sno-Ani-Spb B=Cne C=Ror	30,56	19,73	49,71

<i>Topologies 4</i>	((A,B),C),D)	((A,B),D),C)	((A,C),B),D)	((A,C),D),B)	((A,D),B),C)	((A,D),C),B)	((B,C),A),D)	((B,C),D),A)	((B,D),A),C)	((B,D),C),A)	((C,D),A),B)	((C,D),B),A)	((A,B),(C,D))	((A,C),(B,D))	((A,D),(B,C))
A=Bci B=Ncr C=Sno D=Ani	23,8	17,21	5,26	4,5	2,8	3,07	2,44	1,33	2,32	0,75	7,95	2,38	22,14	1,98	2,07
A=Scce-Ago-Cal B=Yli C=Bci-Ncr D=Sno-Ani	0,53	1,1	0	0	0,03	0	0,08	0	0	0,08	2,96	5,95	89,28	0	0