

**Table S13:** Statistical support of the 20 alternative topologies inferred from dataset sm-aa. Statistical tests include (1) deltaL (logL difference from the maximal logL in the dataset), (2) bp-RELL (bootstrap proportion using RELL method), (3)  $p$ -KH ( $p$ -value of one sided), (3)  $p$ -SH ( $p$ -value of Shimodaira-Hasegawa test), (4) c-ELW (Expected Likelihood Weight), and  $p$ -AU ( $p$ -value of approximately unbiased test) as implemented in IQtree. The KH, SH and AU tests return  $p$ -values, thus a tree is rejected if its  $p$ -value < 0.05 (labeled in red).

Tree	logL	deltaL	bp-RELL	$p$ -KH	$p$ -SH	c-ELW	$p$ -AU
4	-2882592.387	0	0.3337	0.5079	1	0.2266	0.571
2	-2882592.689	0.302	0.1843	0.4921	0.9909	0.1232	0.5965
3	-2882593.05	0.663	0.0457	0.1525	0.9163	0.1178	0.5969
15	-2882593.235	0.849	0.0671	0.1471	0.914	0.1033	0.5895
1	-2882593.352	0.965	0.0141	0.4847	0.9867	0.0633	0.5929
9	-2882593.378	0.992	0.0546	0.4837	0.985	0.0641	0.2052
16	-2882593.538	1.151	0.0413	0.4829	0.9862	0.0548	0.5884
13	-2882596.188	3.801	0.2439	0.4564	0.8856	0.2317	0.4356
20	-2882627.282	34.896	0	0.1986	0.4272	0	<b>0.0028</b>
19	-2882630.867	38.481	0	0.175	0.3848	0	<b>0.001</b>
18	-2882636.965	44.578	0	0.1419	0.312	0	<b>0.0021</b>
5	-2882640.72	48.334	0	0.1269	0.2796	0	<b>0.0003</b>
11	-2882642.604	50.217	0	0.1192	0.2624	0	<b>0</b>
10	-2882642.985	50.598	0	0.1169	0.2598	0	<b>0.0005</b>
8	-2882649.381	56.994	0	0.0939	0.2072	0	<b>0.0049</b>
6	-2882653.875	61.489	0.0078	0.0175	0.2063	0.0076	<b>0.022</b>
7	-2882654.25	61.864	0.0044	0.1006	0.1829	0.0041	<b>0.0264</b>
14	-2882657.75	65.364	0.0031	0.1009	0.1745	0.0034	<b>0.0259</b>
12	-2882665.616	73.229	0	0.0666	0.1152	0.0001	<b>0.0031</b>
17	-2882684.696	92.309	0	0	0.0678	0	<b>0.0022</b>