

Supplementary Material

Application of cnidae composition in phylogenetic analyses of North Atlantic and Mediterranean dendrophylliid corals (Anthozoa : Scleractinia)

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Fig. S1. Clustering of intra- and inter-specific similarity based on the mean of all the present cnidocysts. In *Balanophyllia* species, different colonies from the same locality are named by successive numbers according to the nomenclature used in Terron-Sigler and López-González (2005). For *B. regia* the stations are: E1 (Island of Croix, France), E3 (Top of the Cross, Madeira, Portugal) and E5 (Marseille, France), and for *B. europaea*: E1 (La Caleta, Cadiz, Spain) E3 (Cesareo Port, Italy) and E5 (Maremonte, Cyprus).

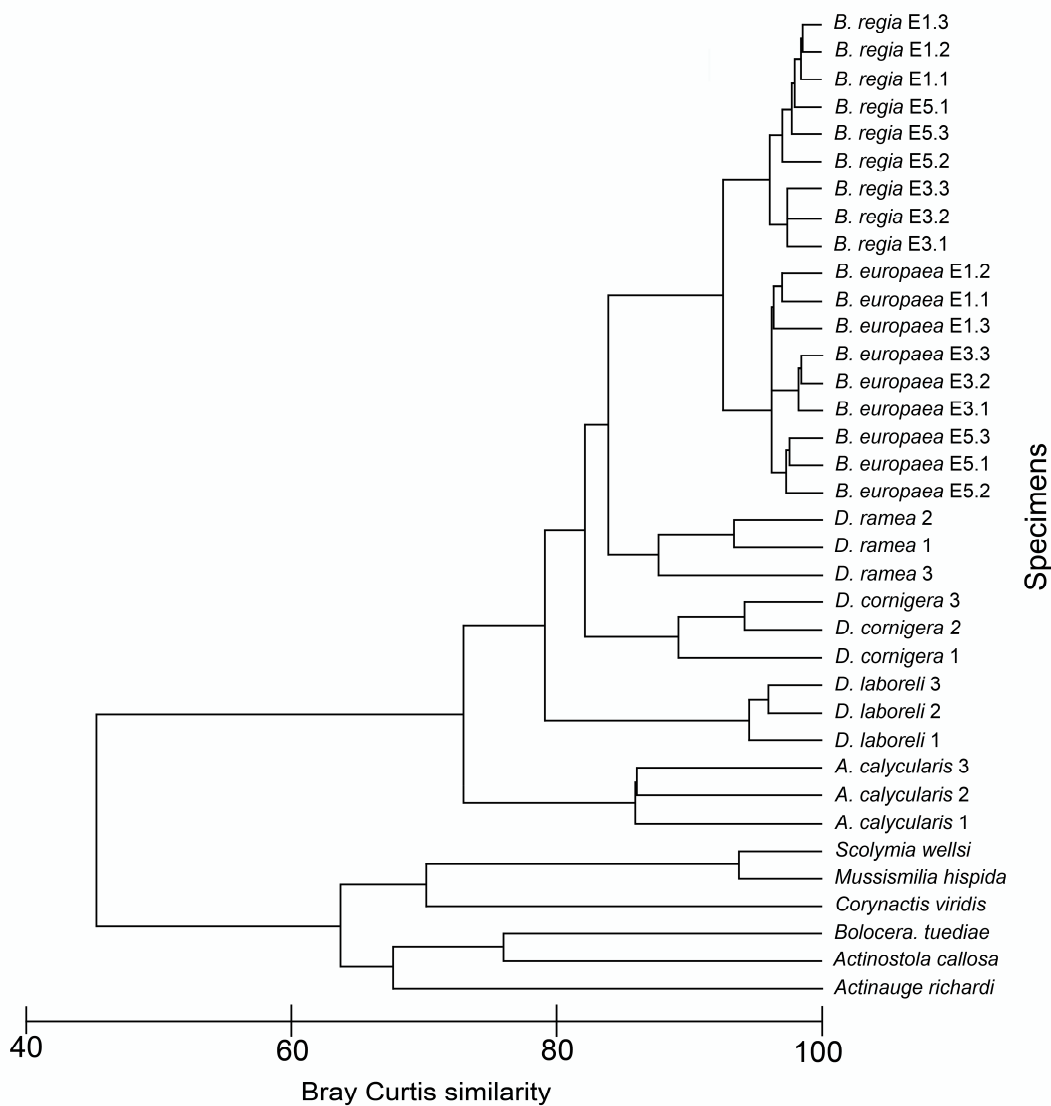


Fig. S2. Tree topology example for the relationships of dendrophylliid genera here studies with K=5, 6, and 10.

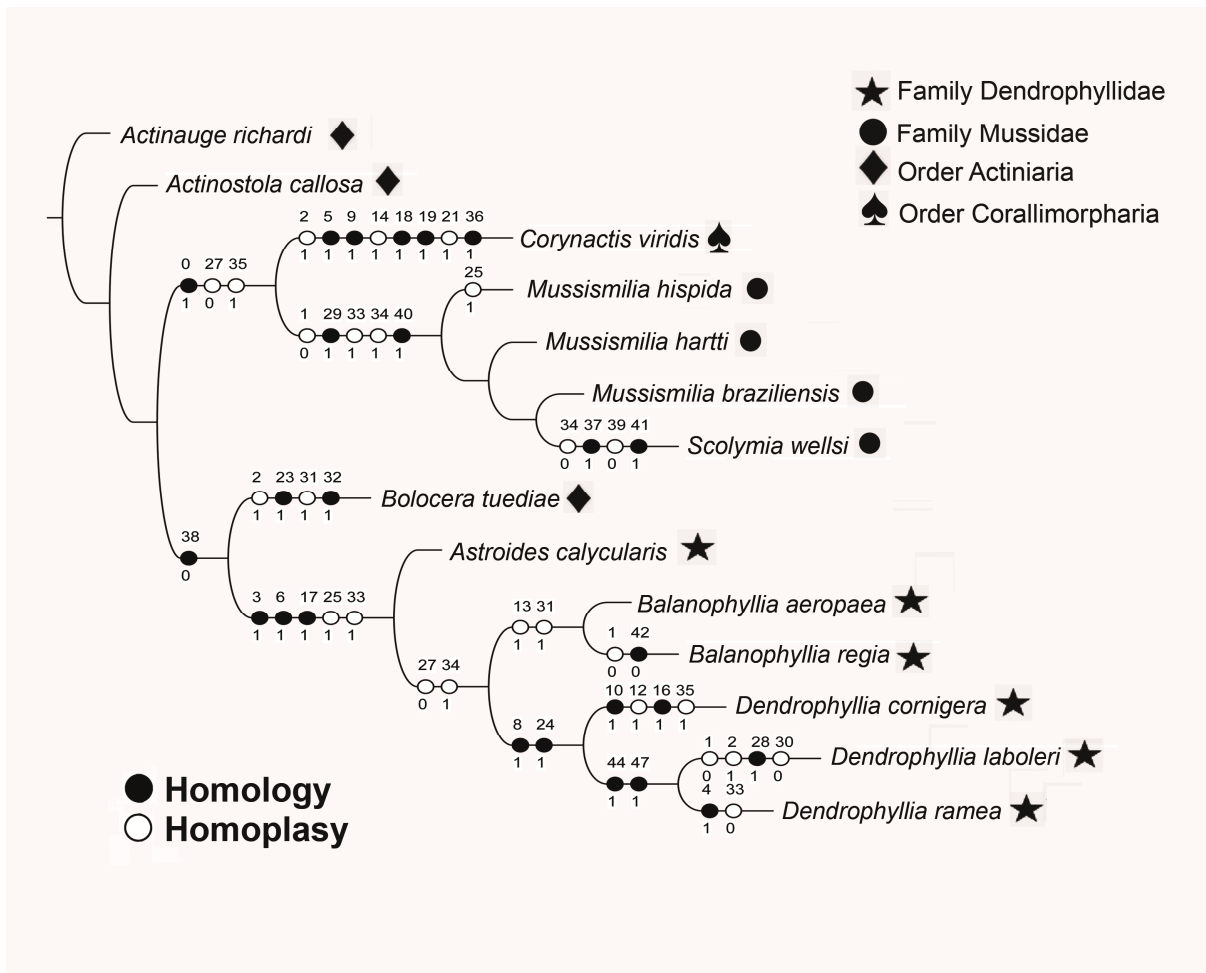


Table S1. Results of the classification of the discriminant analysis (DA)

		Specie	Predicted ownership group						Total
			<i>D.cornigera</i>	<i>D.laboreli</i>	<i>D.ramea</i>	<i>A.calycularis</i>	<i>B.europaea</i>	<i>B.regia</i>	
Original	Inventory	<i>D.cornigera</i>	113	1	4	0	0	0	118
		<i>D.laboreli</i>	5	92	4	1	22	11	135
		<i>D.ramea</i>	1	1	101	0	3	1	107
		<i>A.calycularis</i>	0	6	0	20	5	5	36
		<i>B.europaea</i>	0	28	4	0	77	26	135
		<i>B.regia</i>	0	1	0	4	23	107	135
	%	<i>D.cornigera</i>	95.8	0.8	3.4	0.0	0.0	0.0	100.0
		<i>D.laboreli</i>	3.7	68.1	3.0	0.7	16.3	8.1	100.0
		<i>D.ramea</i>	0.9	0.9	94.4	0.0	2.8	0.9	100.0
		<i>A.calycularis</i>	0.0	16.7	0.0	55.6	13.9	13.9	100.0
		<i>B.europaea</i>	0.0	20.7	3.0	0.0	57.0	19.3	100.0
		<i>B.regia</i>	0.0	0.7	0.0	3.0	17.0	79.3	100.0
Crossed validation	Inventory	<i>D.cornigera</i>	113	1	4	0	0	0	118
		<i>D.laboreli</i>	5	90	4	1	24	11	135
		<i>D.ramea</i>	1	1	101	0	3	1	107
		<i>A.calycularis</i>	0	6	0	19	5	6	36
		<i>B.europaea</i>	0	29	4	0	75	27	135
		<i>B.regia</i>	0	1	0	4	26	104	135
	%	<i>D.cornigera</i>	95.8	0.8	3.4	0.0	0.0	0.0	100.0
		<i>D.laboreli</i>	3.7	66.7	3.0	0.7	17.8	8.1	100.0
		<i>D.ramea</i>	0.9	0.9	94.4	0.0	2.8	0.9	100.0
		<i>A.calycularis</i>	0.0	16.7	0.0	52.8	13.9	16.7	100.0
		<i>B.europaea</i>	0.0	21.5	3.0	0.0	55.6	20.0	100.0
		<i>B.regia</i>	0.0	0.7	0.0	3.0	19.3	77.0	100.0

Table S2. Matrix of 51 cnidae characters (presence/absence data) from all the tissues for the species in the Figure 7

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	SP	B1	B3	H1	H2	H3	H5	PM1	PM2	PM4	PM5	SP	B1	B2	B3	B4	H1	H2	H4	PM2	PM3	B1	B2	B4	H1	H2	H3	PM1	PM2
	SCAPUS											TENTACLES										PHARYNX							
<i>Actinauge richardi</i>	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	
<i>Actinostola callosa</i>	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
<i>Bolocera tuediae</i>	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
<i>Corynactis viridis</i>	1	1	1	0	0	1	0	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	0	0	0	0	1	0	0
<i>Mussismilia hispida</i>	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0
<i>Mussismilia hartti</i>	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0
<i>Mussismilia braziliensis</i>	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0
<i>Scolymia wellsii</i>	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0
<i>Dendrophyllia cornigera</i>	0	1	0	1	0	0	1	0	1	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	1	1	0	0	0
<i>Dendrophyllia laboreli</i>	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	1	1	0	0	1
<i>Dendrophyllia ramea</i>	0	1	0	1	1	0	1	1	1	0	0	1	0	0	0	0	1	0	0	1	1	1	0	1	1	0	0	0	0
<i>Astroides calycularis</i>	0	1	0	1	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	1	0
<i>Balanophyllia europeae</i>	0	1	0	1	0	0	1	1	0	0	0	1	0	1	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0
<i>Balanophyllia regia</i>	0	0	0	1	0	0	1	0	0	0	0	1	0	1	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0

29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

	SP	B1	B2	B4	H1	H2	H3	H4	H5	PM1	PM2	PM3	PM4	B1	H1	H2	H4	PM1	PM2	B3	B1	B2
	MESENTERIAL FILAMENTS													COLUMELLA						ACONTIA	PEDAL DISC	
<i>Actinauge richardi</i>	0	1	0	0	0	0	0	0	0	1	0	0	0	-	-	-	-	-	-	1	1	1
<i>Actinostola callosa</i>	0	1	0	0	0	0	0	0	0	1	0	0	0	-	-	-	-	-	-	-	0	1
<i>Bolocera tuediae</i>	0	0	1	1	0	0	0	0	0	0	1	0	0	-	-	-	-	-	-	-	0	1
<i>Corynactis viridis</i>	0	1	0	0	0	0	1	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-
<i>Mussismilia hispida</i>	1	1	0	0	1	1	1	0	0	1	1	1	0	-	-	-	-	-	-	-	-	-
<i>Mussismilia hartti</i>	1	1	0	0	1	1	1	0	0	1	1	1	0	-	-	-	-	-	-	-	-	-
<i>Mussismilia braziliensis</i>	1	1	0	0	1	1	1	0	0	1	1	1	0	-	-	-	-	-	-	-	-	-
<i>Scolymia wellsii</i>	1	1	0	0	1	0	1	0	1	1	0	1	1	-	-	-	-	-	-	-	-	-
<i>Dendrophyllia cornigera</i>	0	1	0	0	1	1	1	0	0	0	1	0	0	1	1	0	1	0	0	-	-	-
<i>Dendrophyllia laboreli</i>	0	0	0	0	1	1	0	0	0	0	1	0	0	1	1	1	1	0	1	-	-	-
<i>Dendrophyllia ramea</i>	0	1	0	0	0	1	0	0	0	0	1	0	0	1	1	1	1	0	1	-	-	-
<i>Astroides calycularis</i>	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	1	1	0	-	-	-
<i>Balanophyllia europeae</i>	0	1	1	0	1	1	0	0	0	0	1	0	0	1	1	0	1	0	0	-	-	-
<i>Balanophyllia regia</i>	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	-	-	-

Table S3. Matrix of 29 cnidae characters (presence/absence data) from only two tissues (tentacle and mesenterial filament) for the species in the Figure 8

Opaque capsule is a character introduced by Picciani *et al.* (2011)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
	SP	B1	B2	B3	B4	H1	H2	H3	H4	H5	PM1	PM2	PM3	PM4	Opaque capsule	SP	B1	B2	B3	B4	H1	H2	H3	H4	H5	PM1	PM2	PM3	PM4	
	TENTACLES															MESENTERIAL FILAMENTS														
<i>Actinauge richardi</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	
<i>Actinostola callosa</i>	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	
<i>Bolocera tuediae</i>	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	
<i>Corynactis viridis</i>	1	0	0	1	1	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	
<i>Mussismilia hispida</i>	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	
<i>Mussismilia hartti</i>	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	
<i>Mussismilia braziliensis</i>	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	
<i>Scolymia wellsii</i>	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	0	1	1	0	1	1	
<i>Dendrophyllia cornigera</i>	1	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0	
<i>Dendrophyllia laboreli</i>	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	
<i>Dendrophyllia ramea</i>	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	
<i>Dendrophyllia alternata</i>	1	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1	0	1	
<i>Astroides calycularis</i>	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	
<i>Balanophyllia europaea</i>	1	0	1	1	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	0	0	1	0	0	
<i>Balanophyllia regia</i>	1	0	1	1	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	0	0	1	0	0	
<i>Enallopsammia rostrata</i>	1	1	1	0	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	1	0	0	1	1	1	1	0	1
<i>Tubastrea tagusensis</i>	1	1	0	1	0	0	1	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	1	1	1	1	0	1
<i>Tubastrea coccinea</i>	1	1	1	1	0	0	1	0	0	1	0	0	1	0	1	0	1	1	1	0	0	1	0	0	1	1	1	1	0	1
<i>Flabellum macandrewi</i>	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	
<i>Lophelia pertusa</i>	1	1	0	1	0	0	0	1	1	1	1	?	1	0	0	0	1	0	1	0	0	0	0	1	0	1	1	1	1	
<i>Solenosmilia varibilis</i>	1	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	

Table S4. Combined matrix of 58 characters, characters 0-47 are cnidae information, while characters numbered 48-58 are from Cairns (2001) on skeleton characters and hermatypic condition (see Figure 9)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
	SP	B1	B3	H1	H2	H3	H5	PM1	PM2	PM4	PM5	SP	B1	B2	B3	B4	H1	H2	H4	PM2	PM3	B1	B2	B4	H1	H2	H3	PM1	PM2	
	SCAPUS											TENTACLES										PHARYNX								
<i>Corynactis viridis</i>	1	1	1	0	0	1	0	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	1	0	0	0	0	1	0	0
<i>Balanophyllia europeae</i>	0	1	0	1	0	0	1	1	0	0	0	1	0	1	1	0	0	1	0	0	1	1	0	1	0	0	1	0	0	0
<i>Balanophyllia regia</i>	0	0	0	1	0	0	1	0	0	0	0	1	0	1	1	0	0	1	0	0	1	1	0	1	0	0	1	0	0	0
<i>Astroides calycularis</i>	0	1	0	1	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	1	0	1	0
<i>Dendrophyllia cornigera</i>	0	1	0	1	0	0	1	0	1	0	1	1	1	0	0	0	1	1	0	0	1	1	1	1	0	1	1	0	0	0
<i>Dendrophyllia laboreli</i>	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	1	1	0	0	1
<i>Dendrophyllia ramea</i>	0	1	0	1	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	1	1	1	1	0	1	1	0	0	0
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47											
	SP	B1	B2	B4	H1	H2	H3	H4	H5	PM1	PM2	PM3	PM4	B1	H1	H2	H4	PM1	PM2											
	MESENTERIAL FILAMENTS												COLUMELLA																	
<i>Corynactis viridis</i>	0	1	0	0	0	0	1	1	0	1	0	0	0	-	-	-	-	-	-											
<i>Balanophyllia europeae</i>	0	1	1	0	1	1	0	0	0	0	1	0	0	1	1	0	1	0	0											
<i>Balanophyllia regia</i>	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0											
<i>Astroides calycularis</i>	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	1	1	0											
<i>Dendrophyllia cornigera</i>	0	1	0	0	1	1	1	0	0	0	1	0	0	1	1	0	1	0	0											
<i>Dendrophyllia laboreli</i>	0	0	0	0	1	1	0	0	0	0	1	0	0	1	1	1	1	0	1											
<i>Dendrophyllia ramea</i>	0	1	0	0	0	1	0	0	0	0	1	0	0	1	1	1	1	0	1											
	48	49	50	51	52	53	54	55	56	57																				
	Corallum shape	Colony form	Budding type	Corallum attachment	Synapticulotheca	Epitheca	Endotheca	Septa arrangement	Columella	Zooxanthellae																				
	SKELETON MORPHOLOGY																													
<i>Corynactis viridis</i>	-	-	-	-	-	-	-	-	-	-																				
<i>Balanophyllia europeae</i>	0	0	0	0	0	0	0	1	0	1																				
<i>Balanophyllia regia</i>	0	0	0	0	0	0	0	1	0	0																				
<i>Astroides calycularis</i>	1	2	1	0	0	0	1	0	0	0																				
<i>Dendrophyllia cornigera</i>	1	1	1	0	0	1	1	1	0	0																				
<i>Dendrophyllia laboreli</i>	1	1	1	0	0	1	1	1	0	0																				
<i>Dendrophyllia ramea</i>	1	1	1	0	0	1	1	1	0	0																				

Table S5. Summary of statistical and topological differences among the most parsimonious trees obtained by analysis under equal weighting and implied weighting with seven values for the concavity constant (K)

	Number of trees	Length	Consistency index	Retention index	Ajusted homoplasy
Iqual Weight	1	77	0.597	0.690	6.60
Implied Weighting (K=1)	1	78	0.590	0.680	11.42
Implied Weighting (K=2)	2	78	0.590	0.680	8.30
Implied Weighting (K=2) consensus	1	91	0.505	0.550	10.43
Implied Weighting (K=3)	3	78	0.590	0.680	6.55
Implied Weighting (K=3) consensus	1	91	0.505	0.50	8.42
Implied Weighting (K=4)	2	78	0.590	0.680	5.42
Implied Weighting (K=4) consensus	1	91	0.505	0.550	7.07
Implied Weighting (K=5)	1	77	0.597	0.690	4.61
Implied Weighting (K=6)	1	77	0.597	0.690	4.01
Implied Weighting (K=10)	1	77	0.597	0.690	2.64