

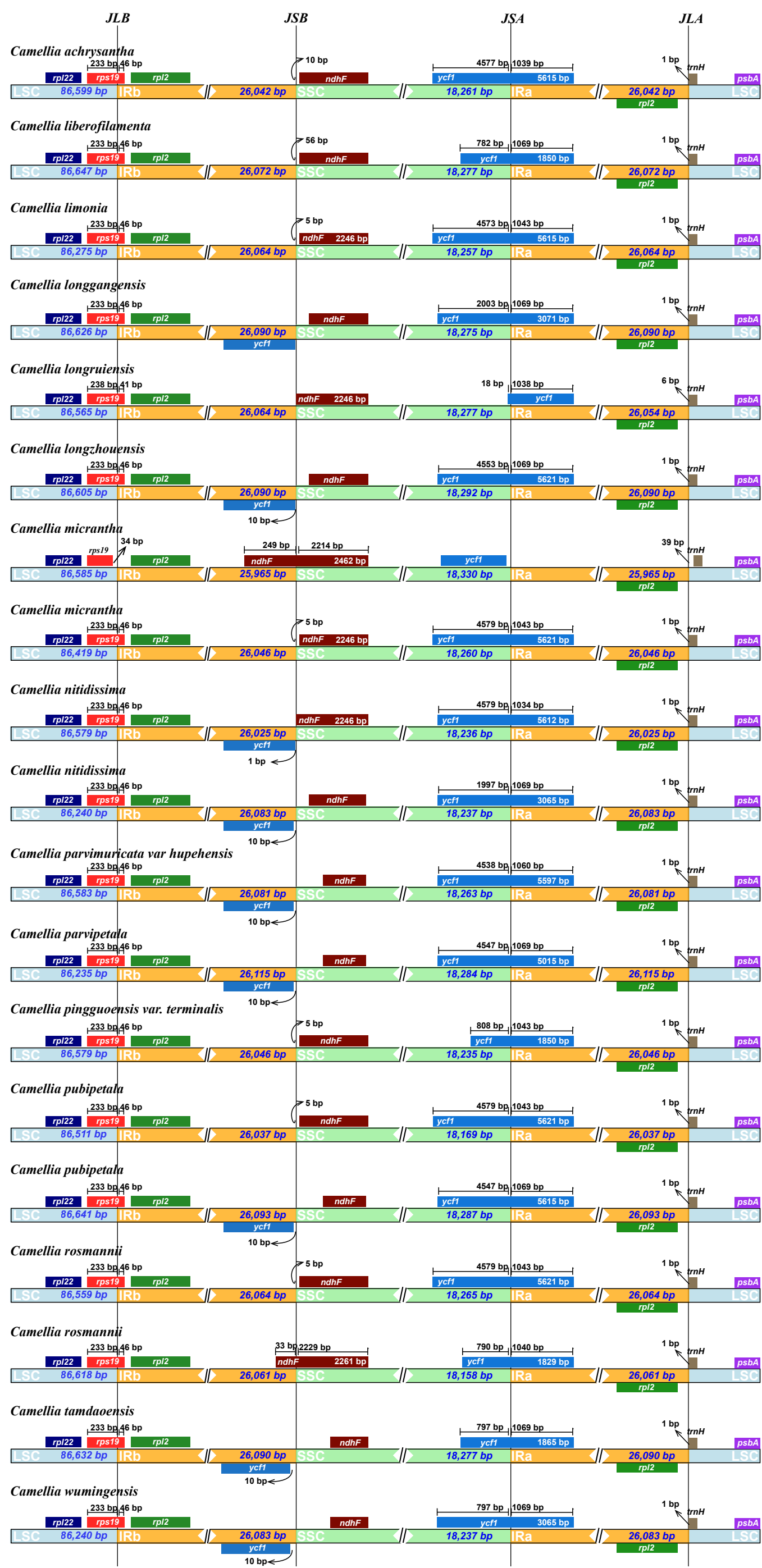
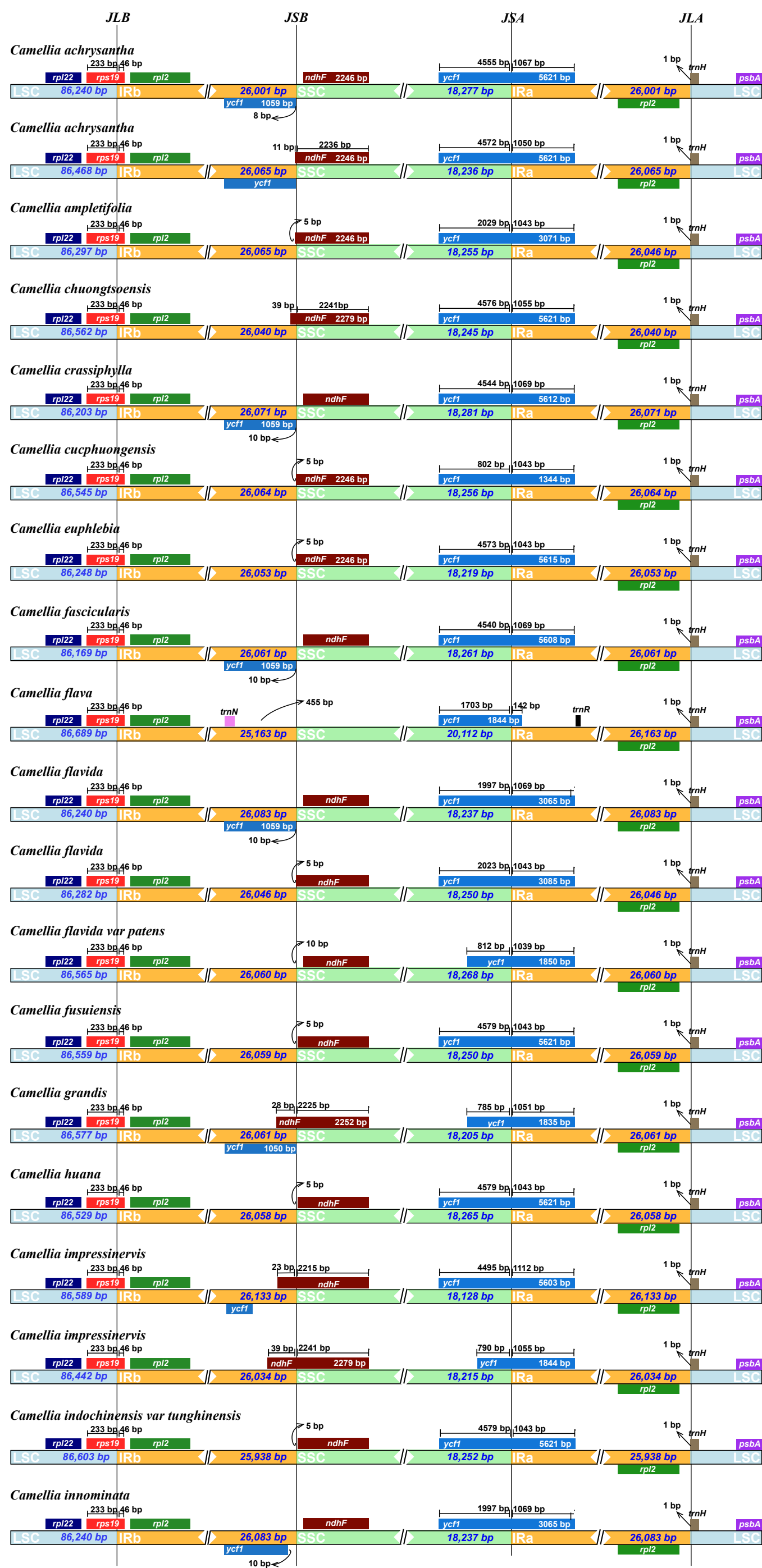


Figure S1 Comparison of the quadripartite structure borders among golden *Camellia* species genomes.

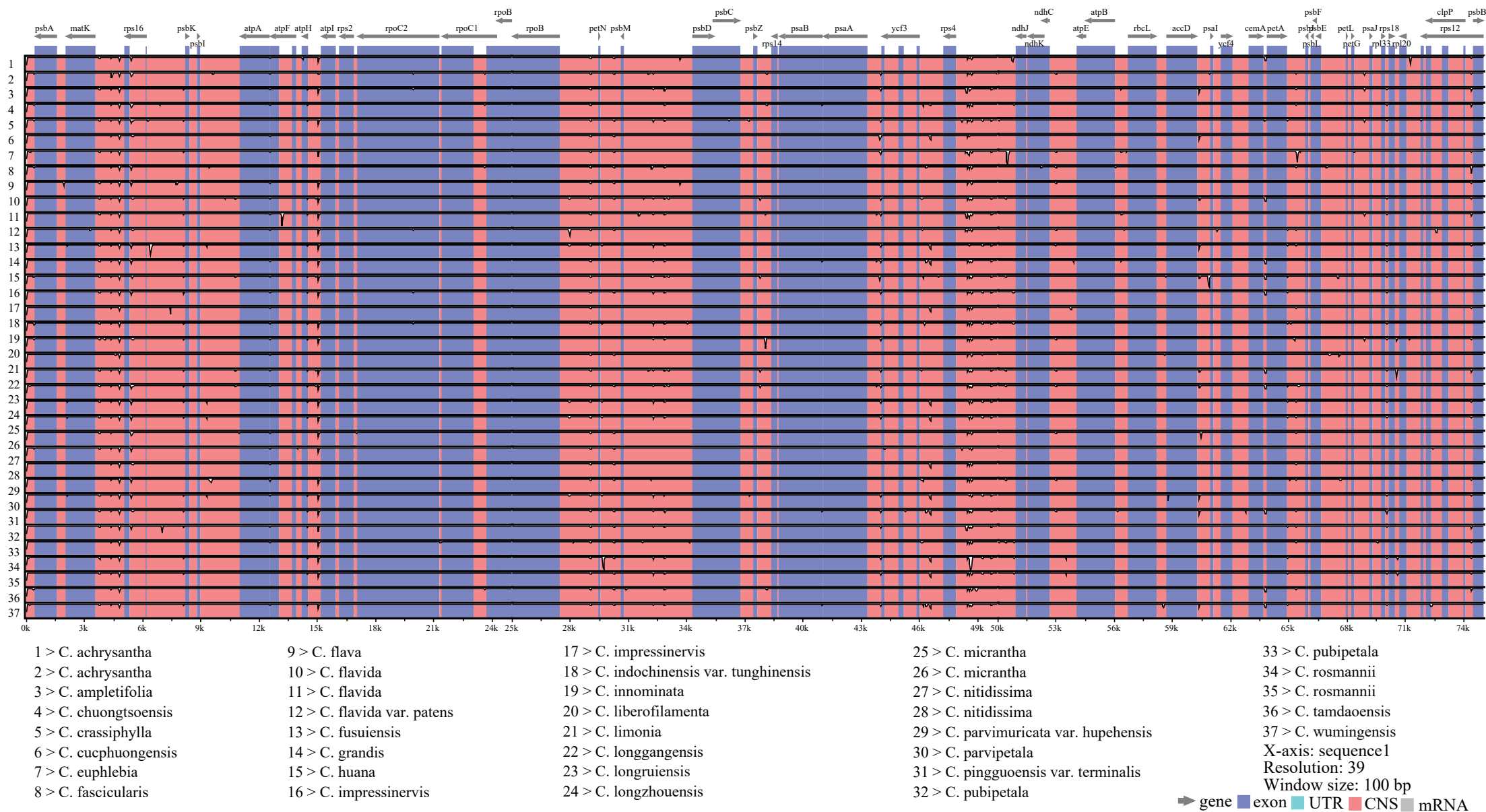
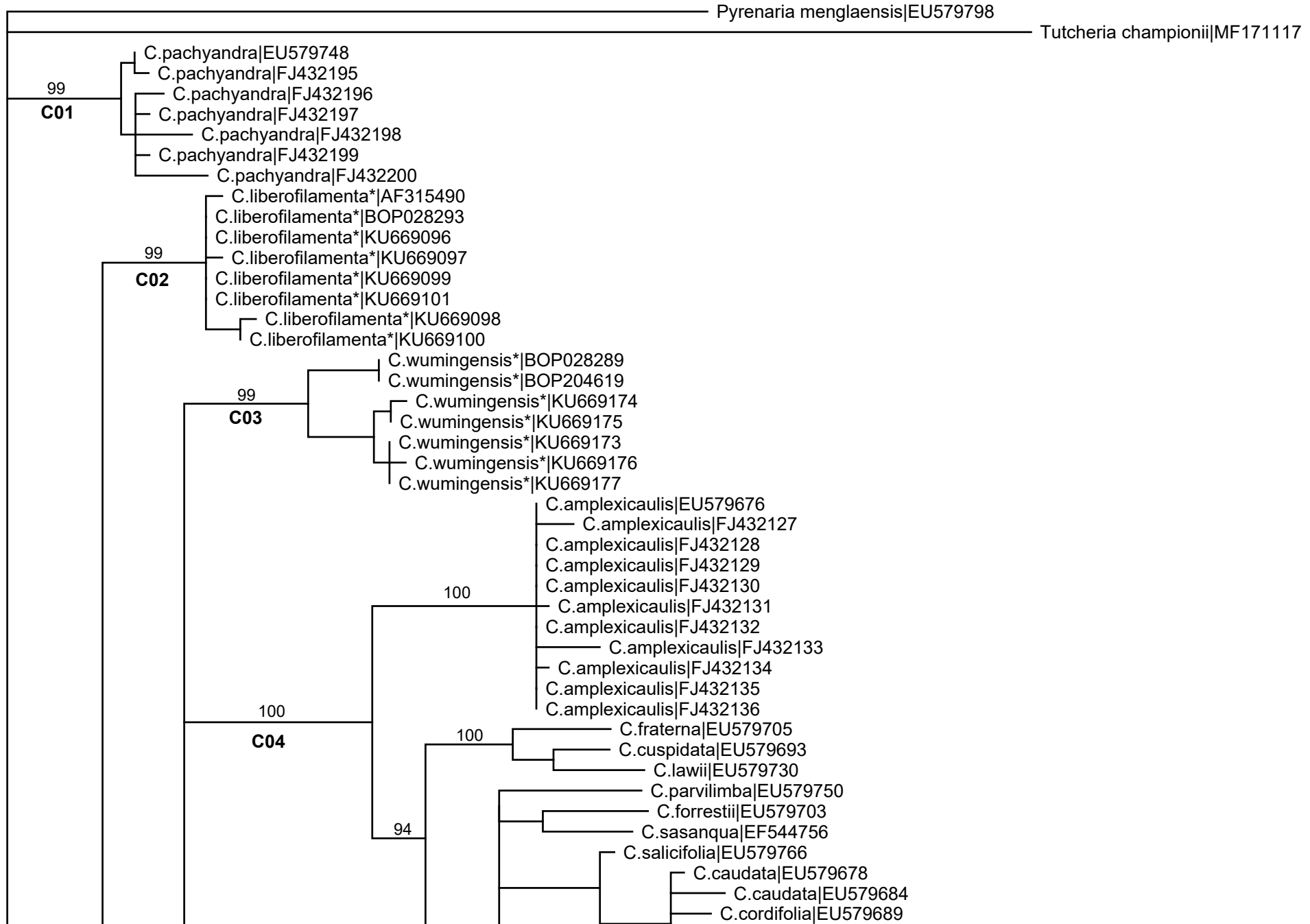
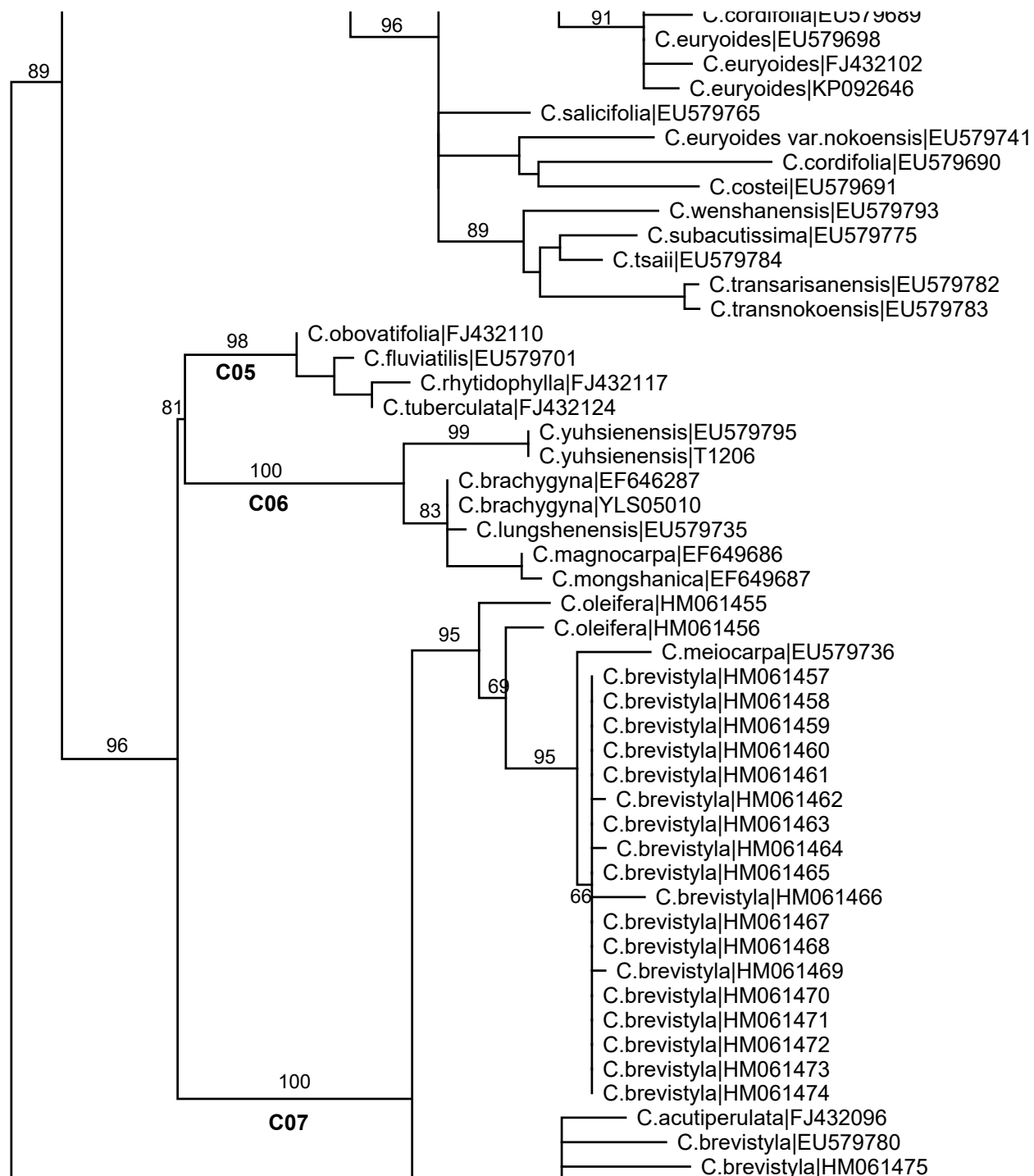
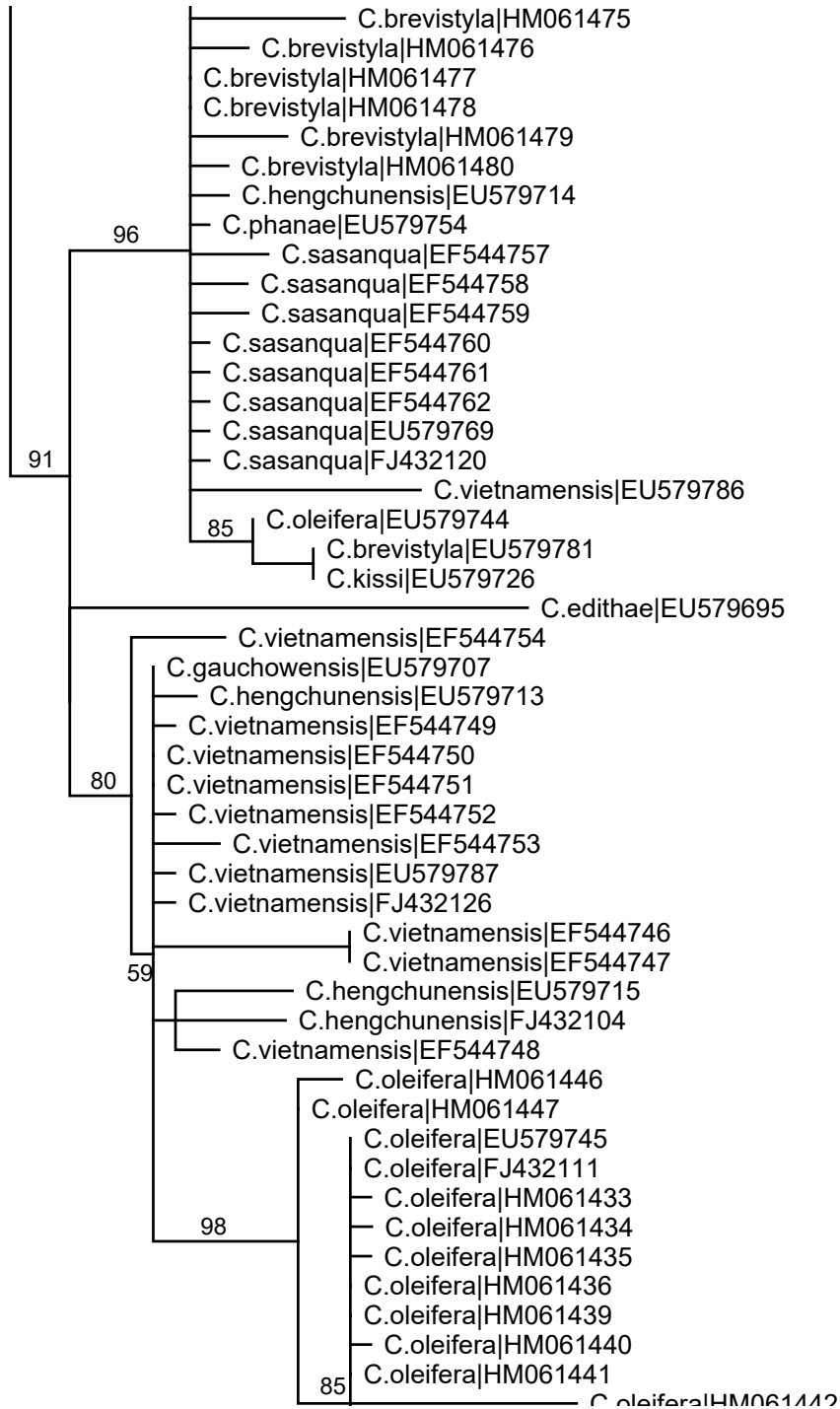
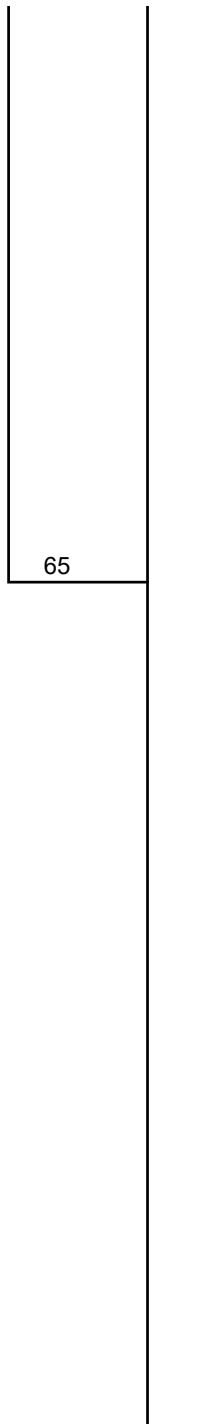
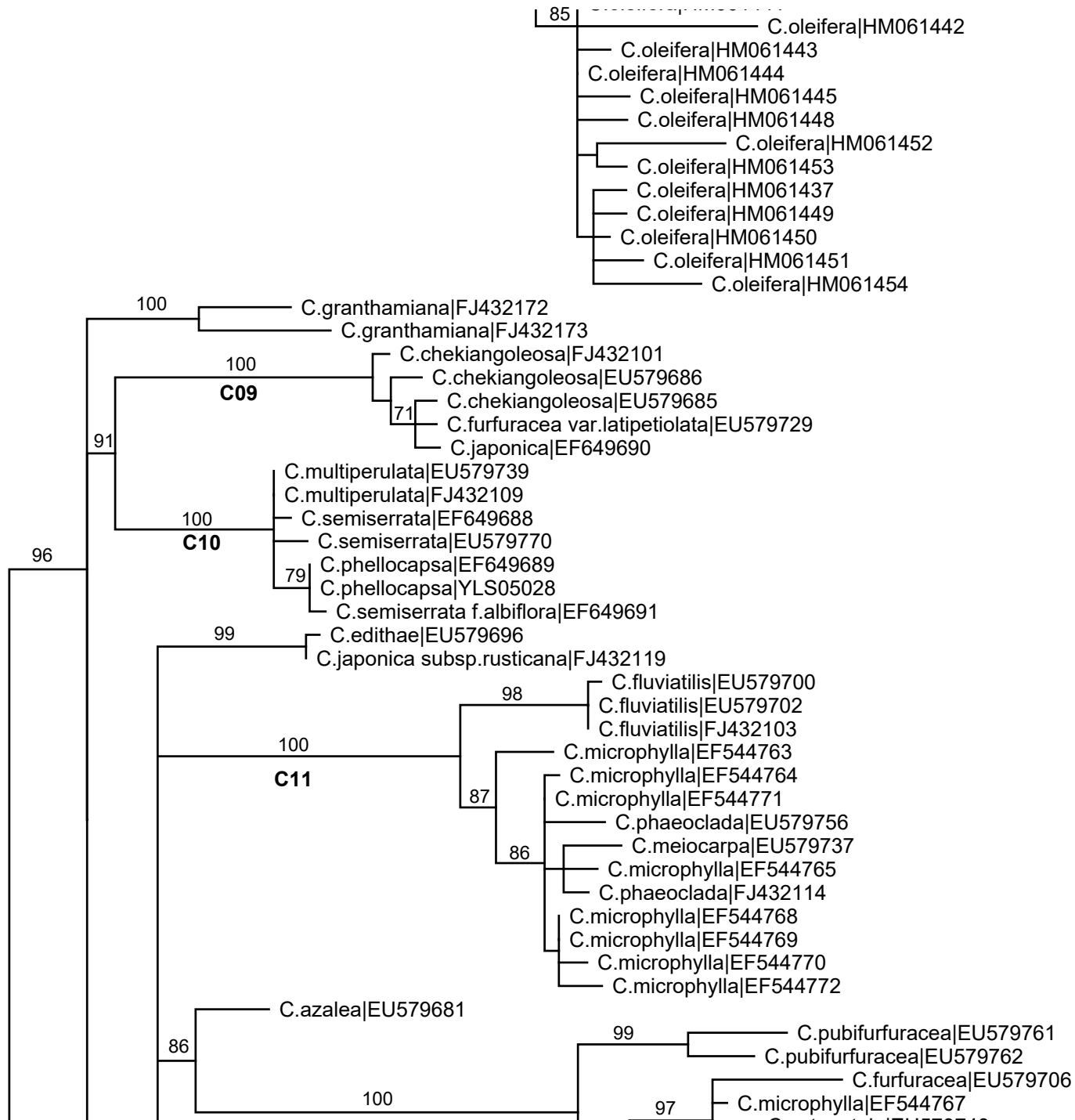


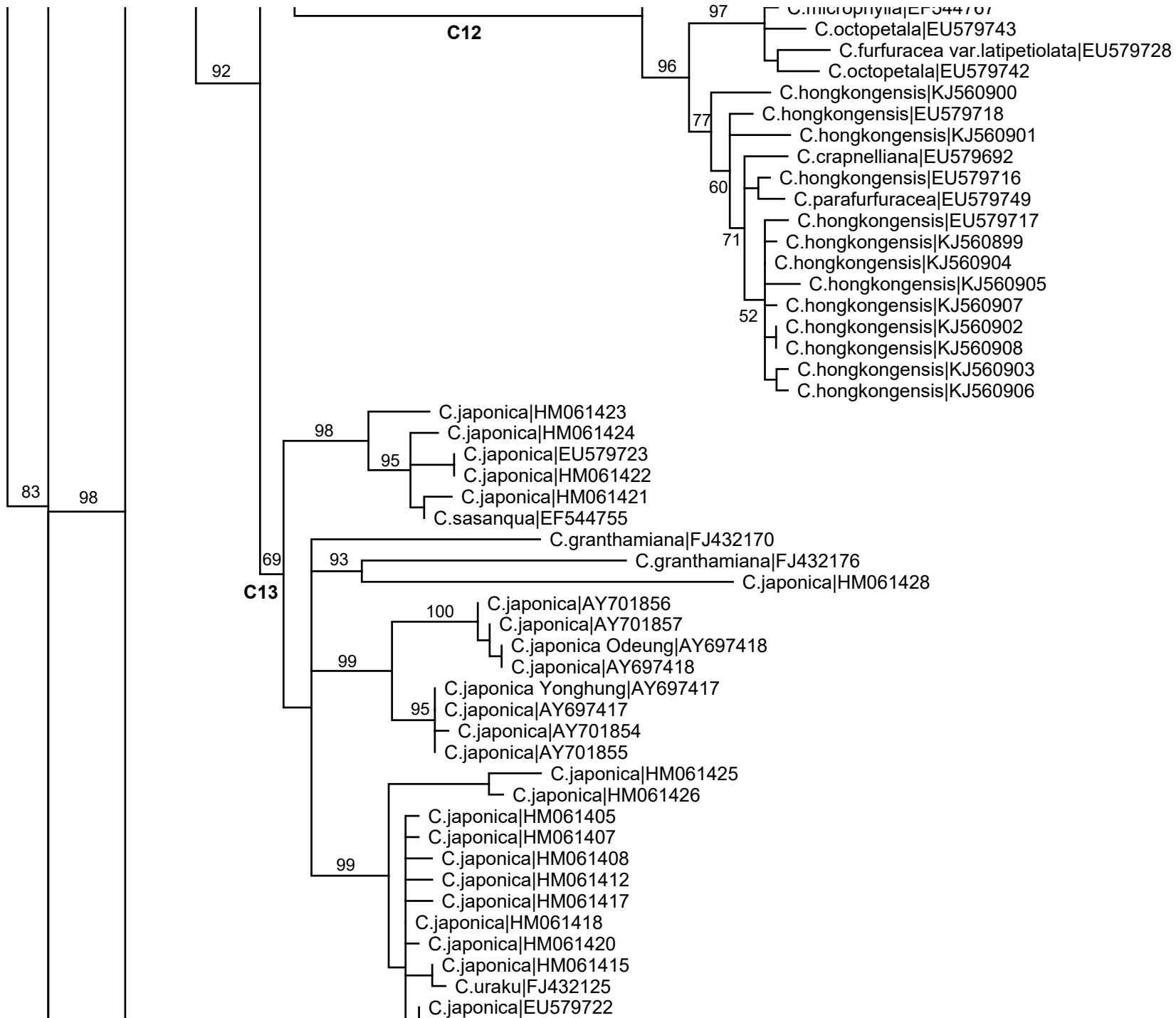
Figure S2 Results of mVISTA analysis showing genome differences in the sequences among golden *Camellia* species.

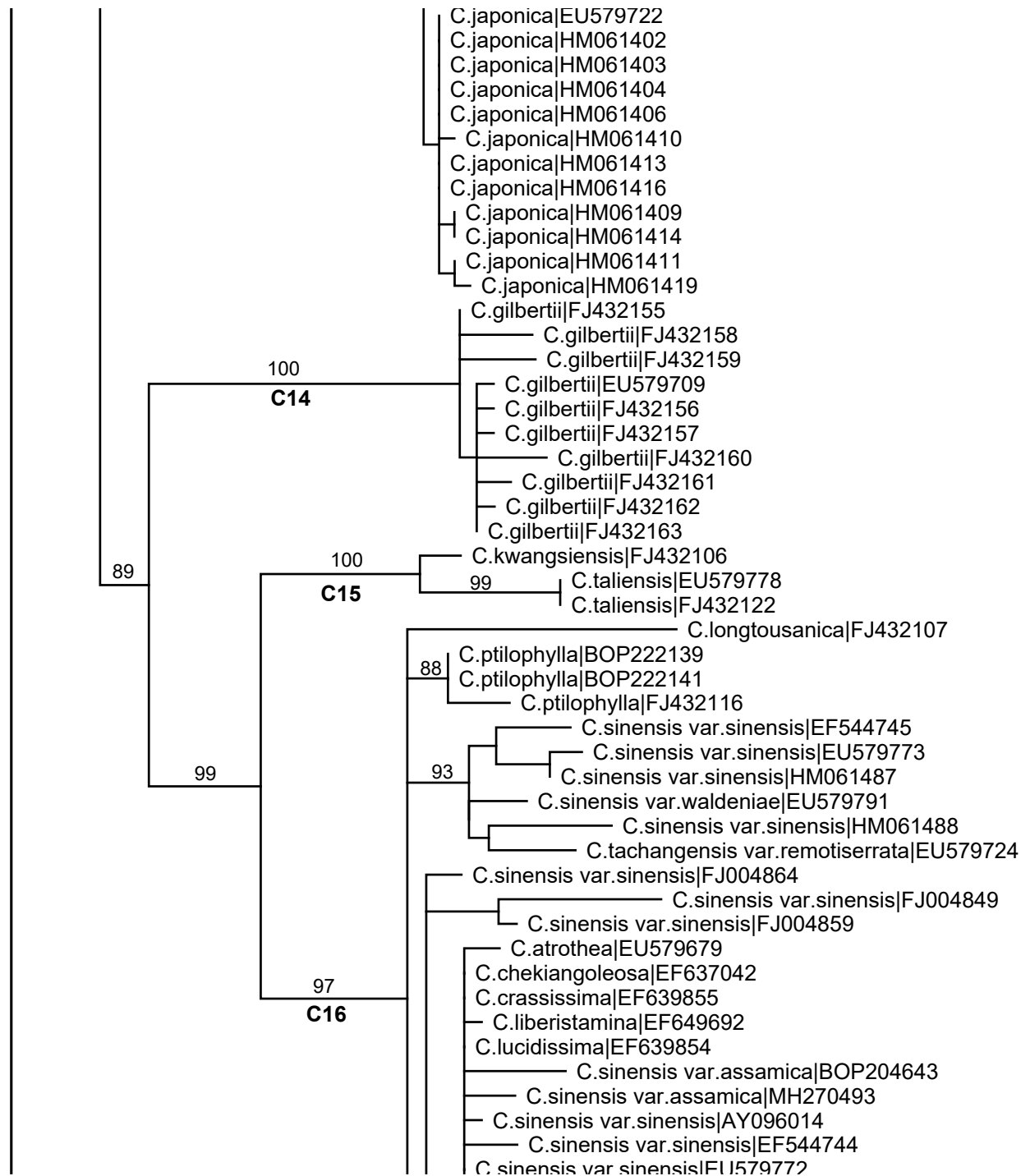


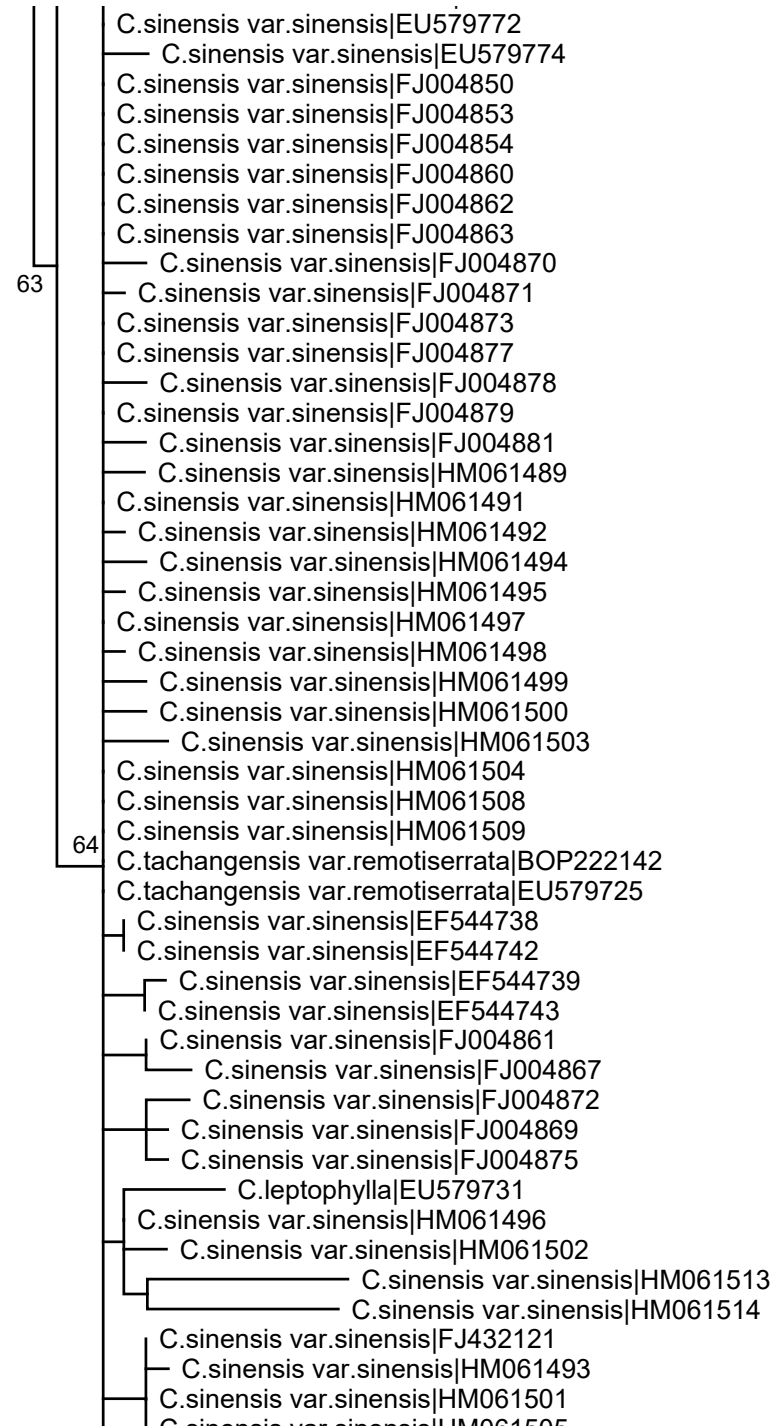


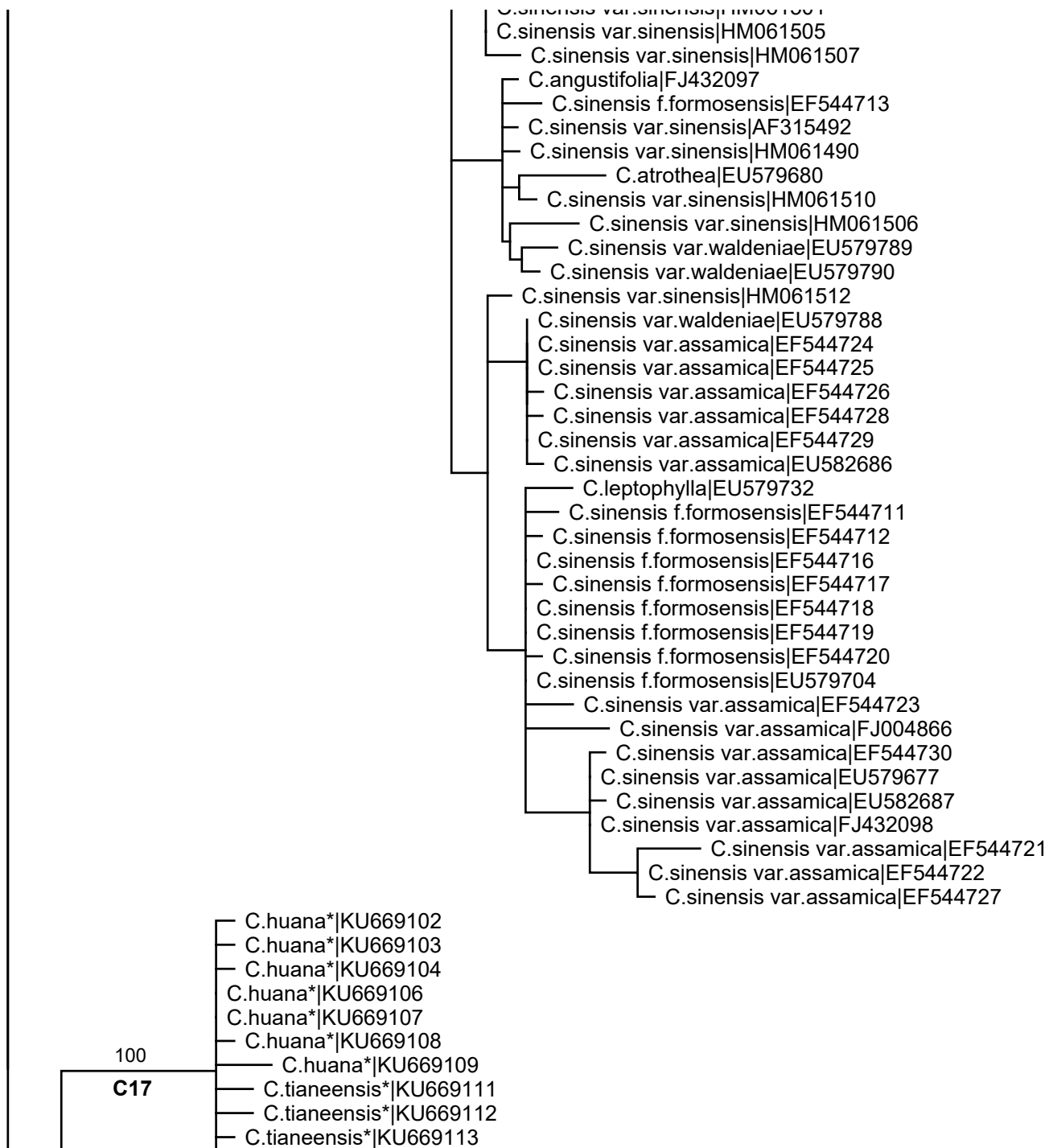


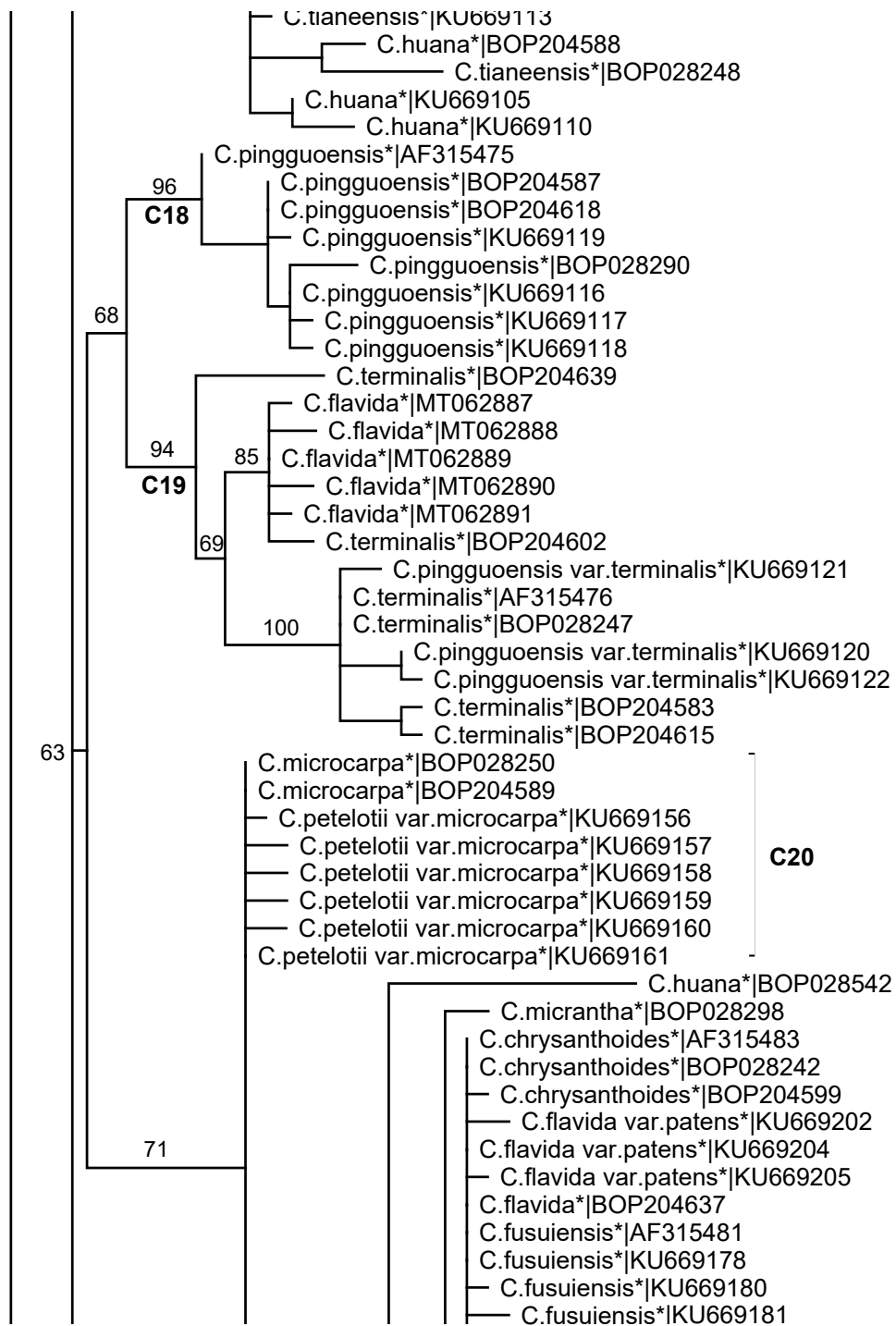


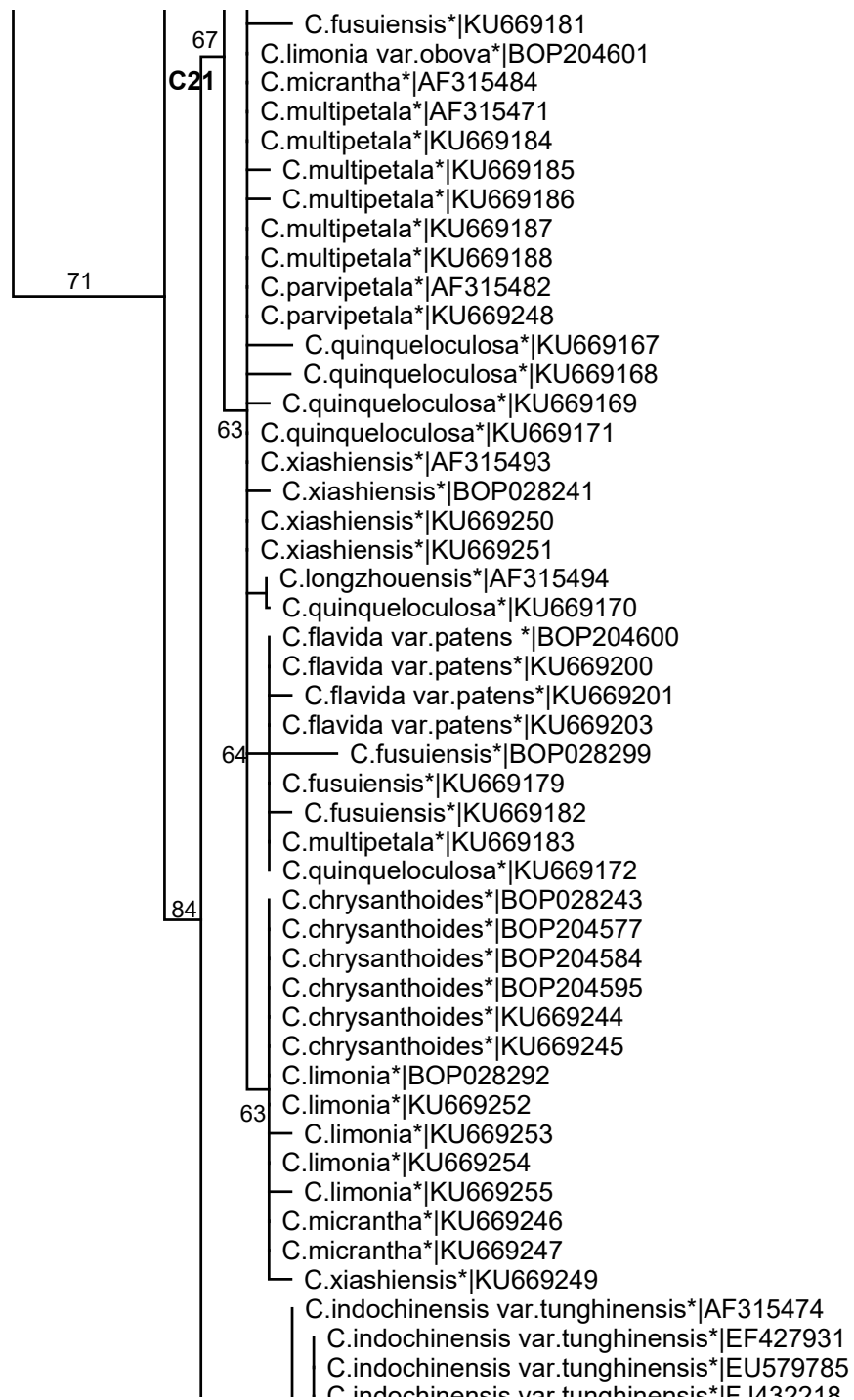


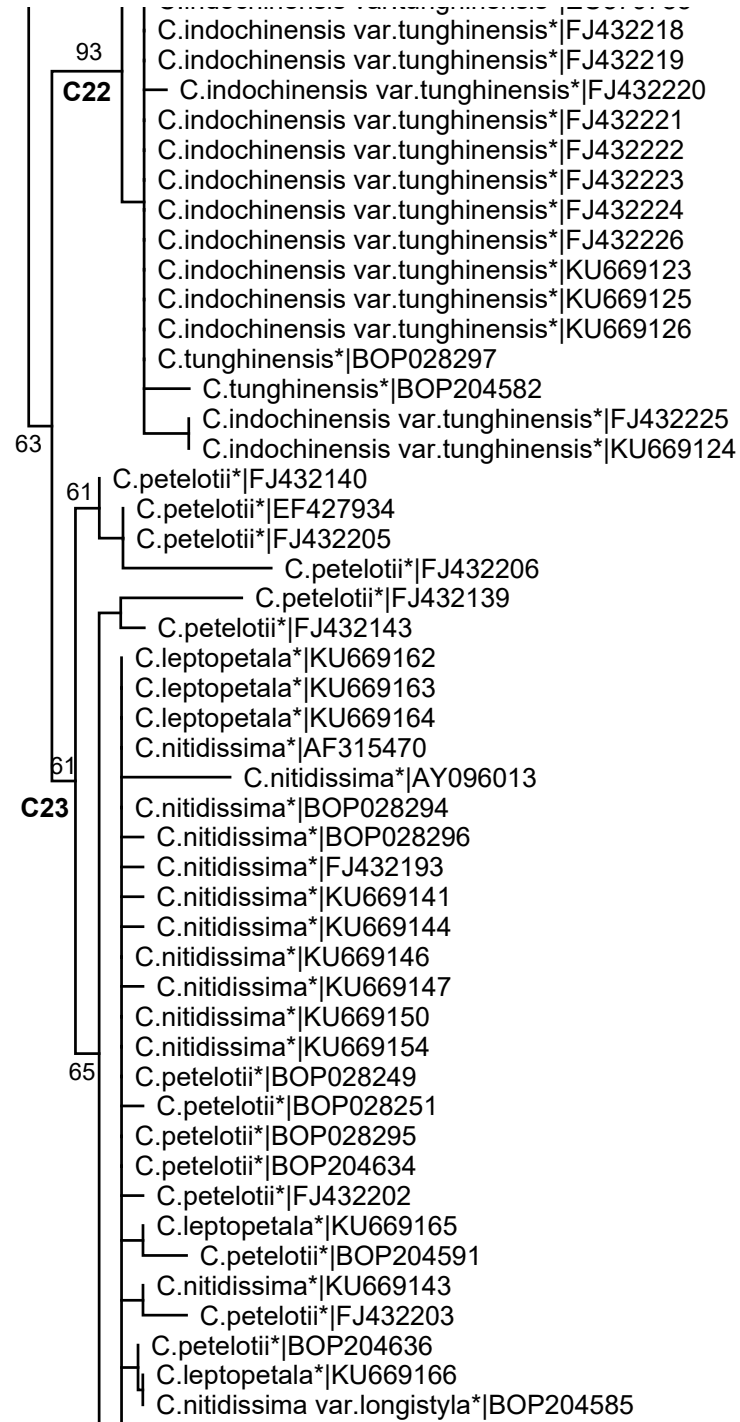






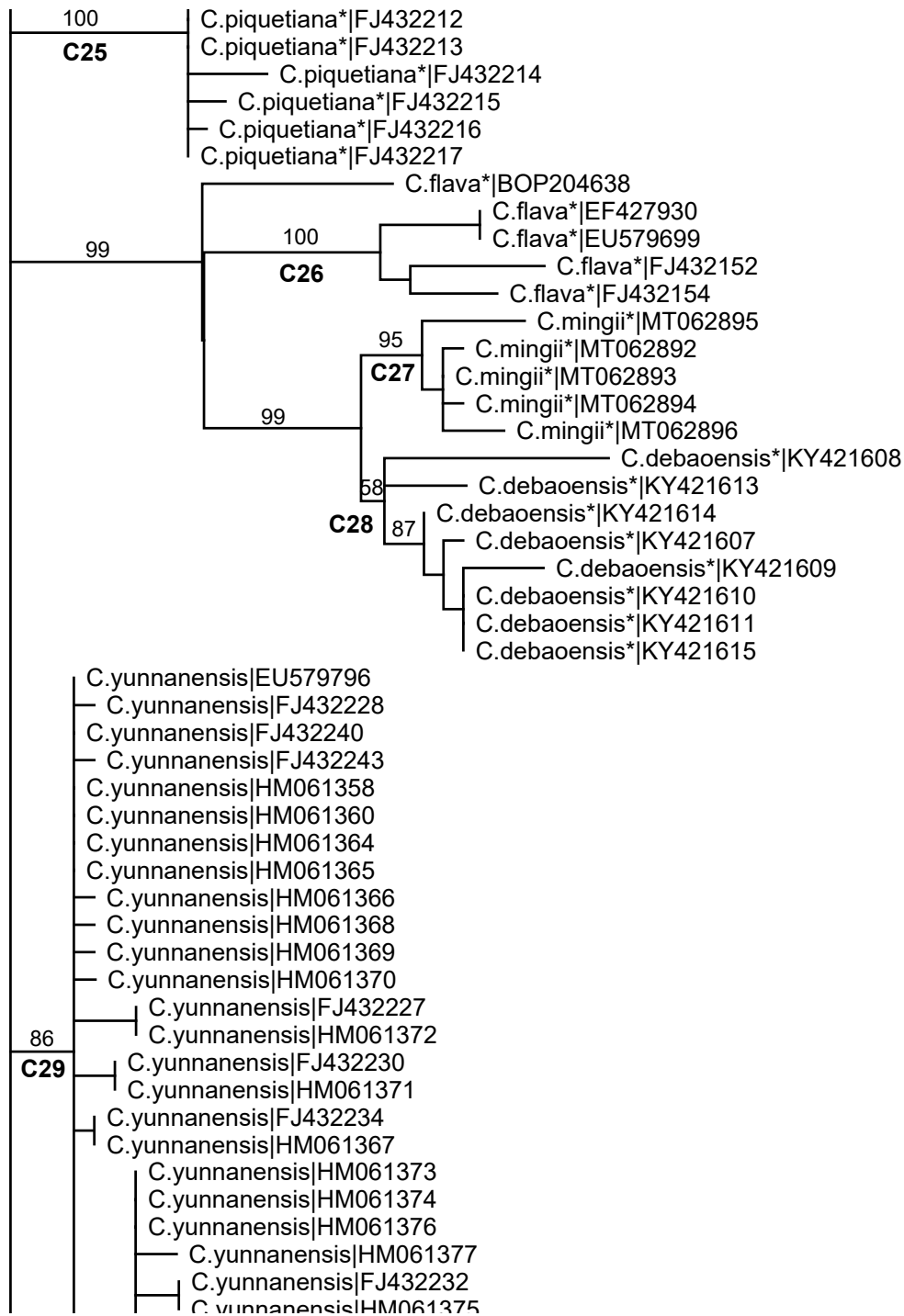


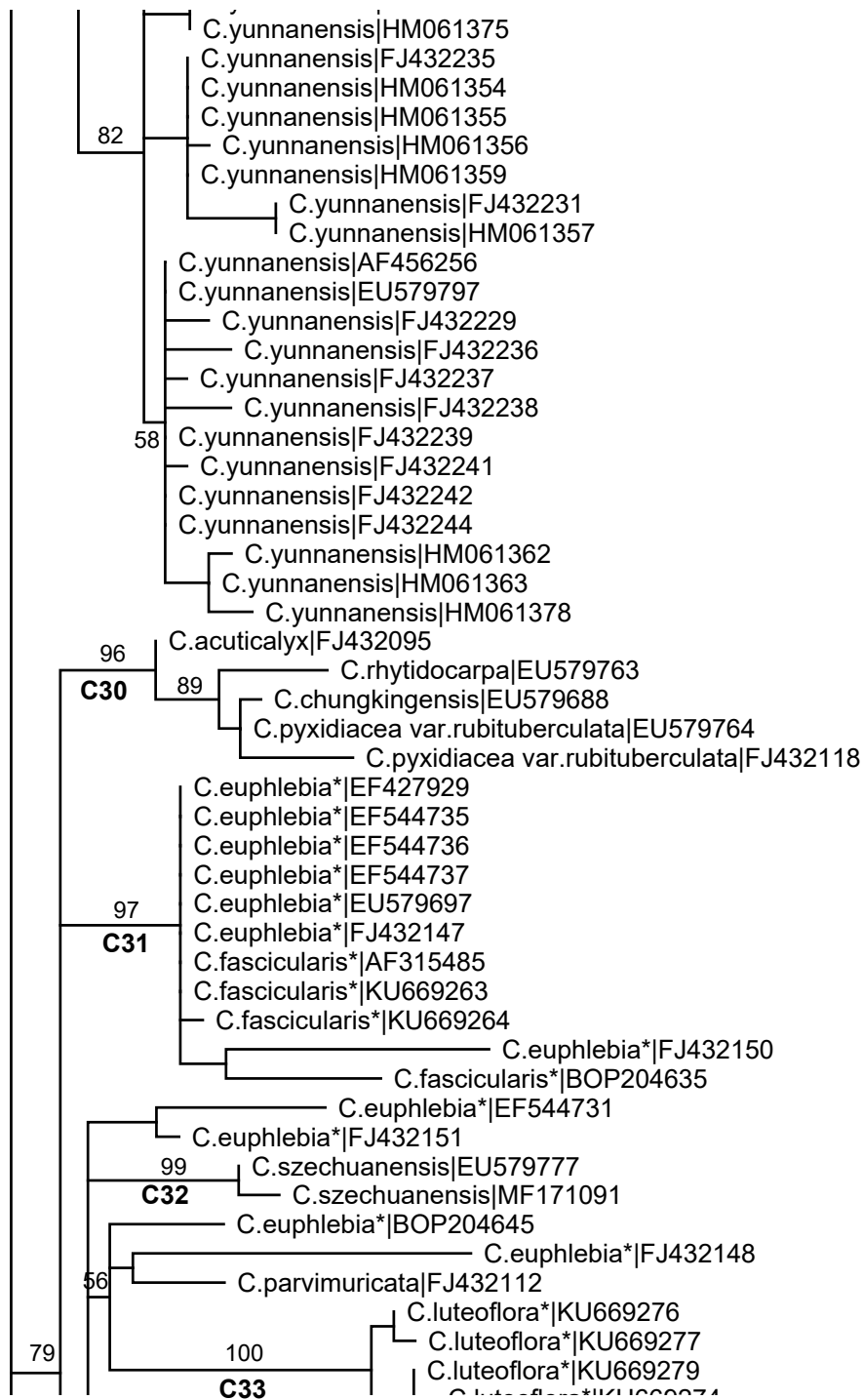


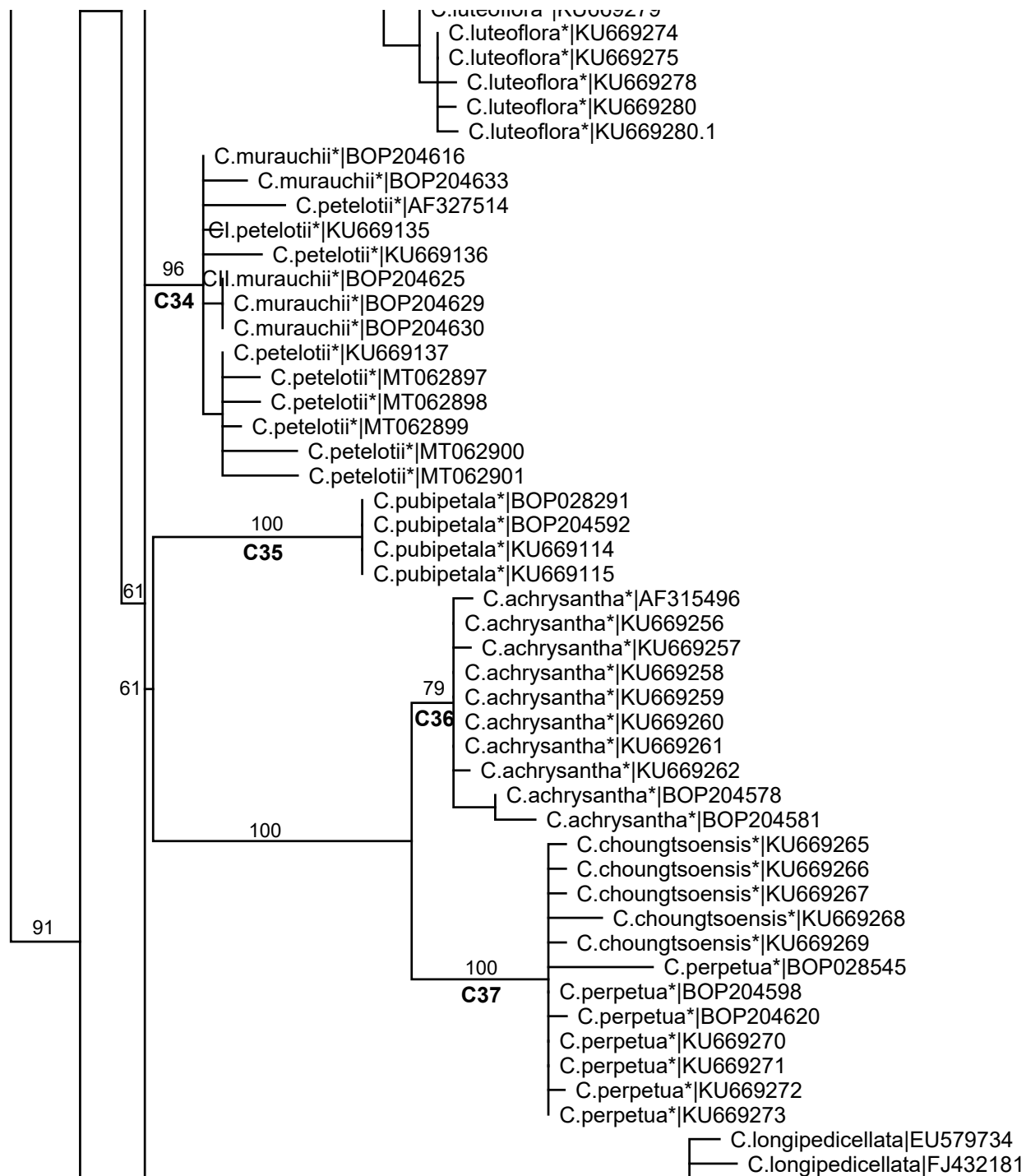


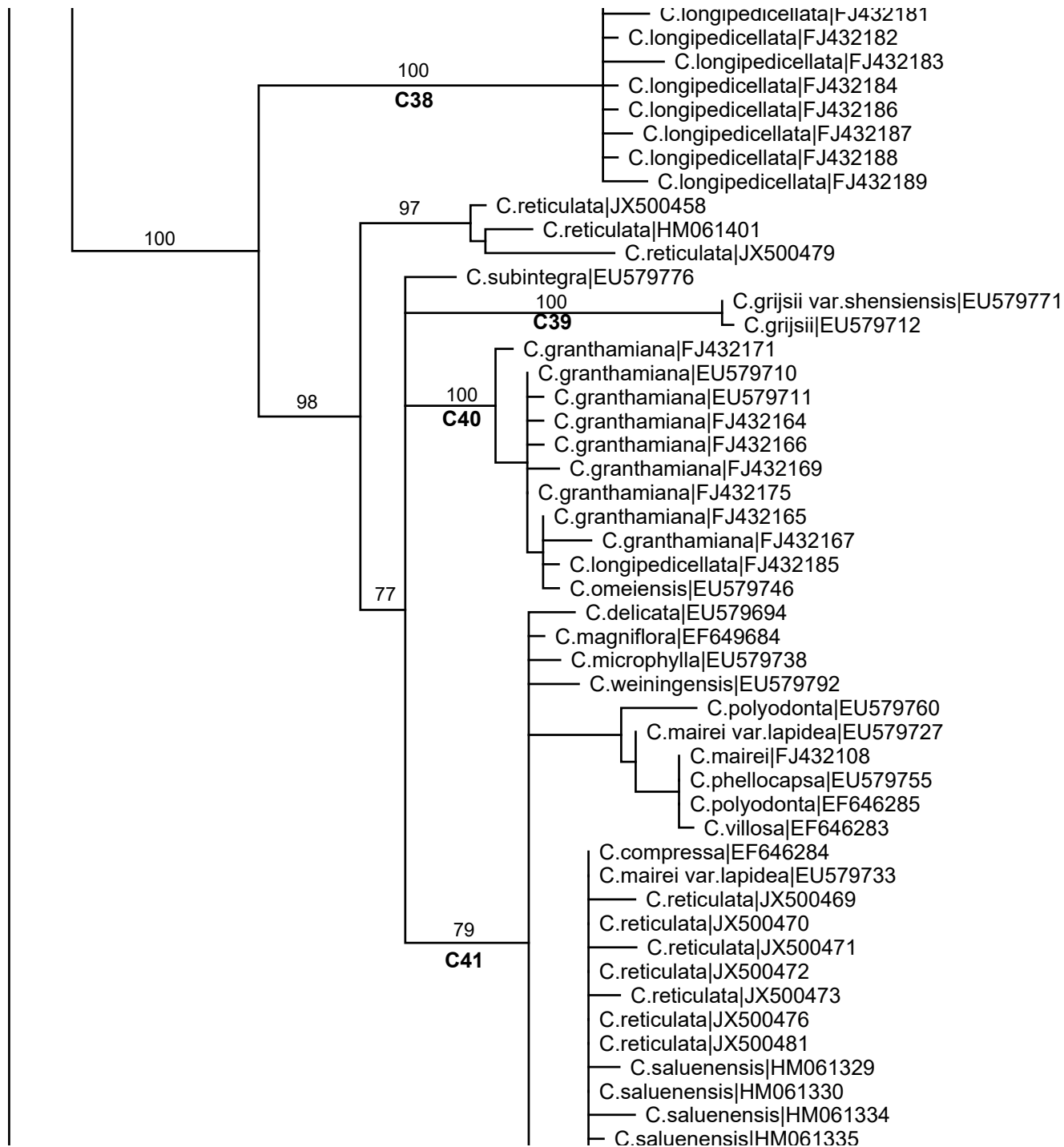
91

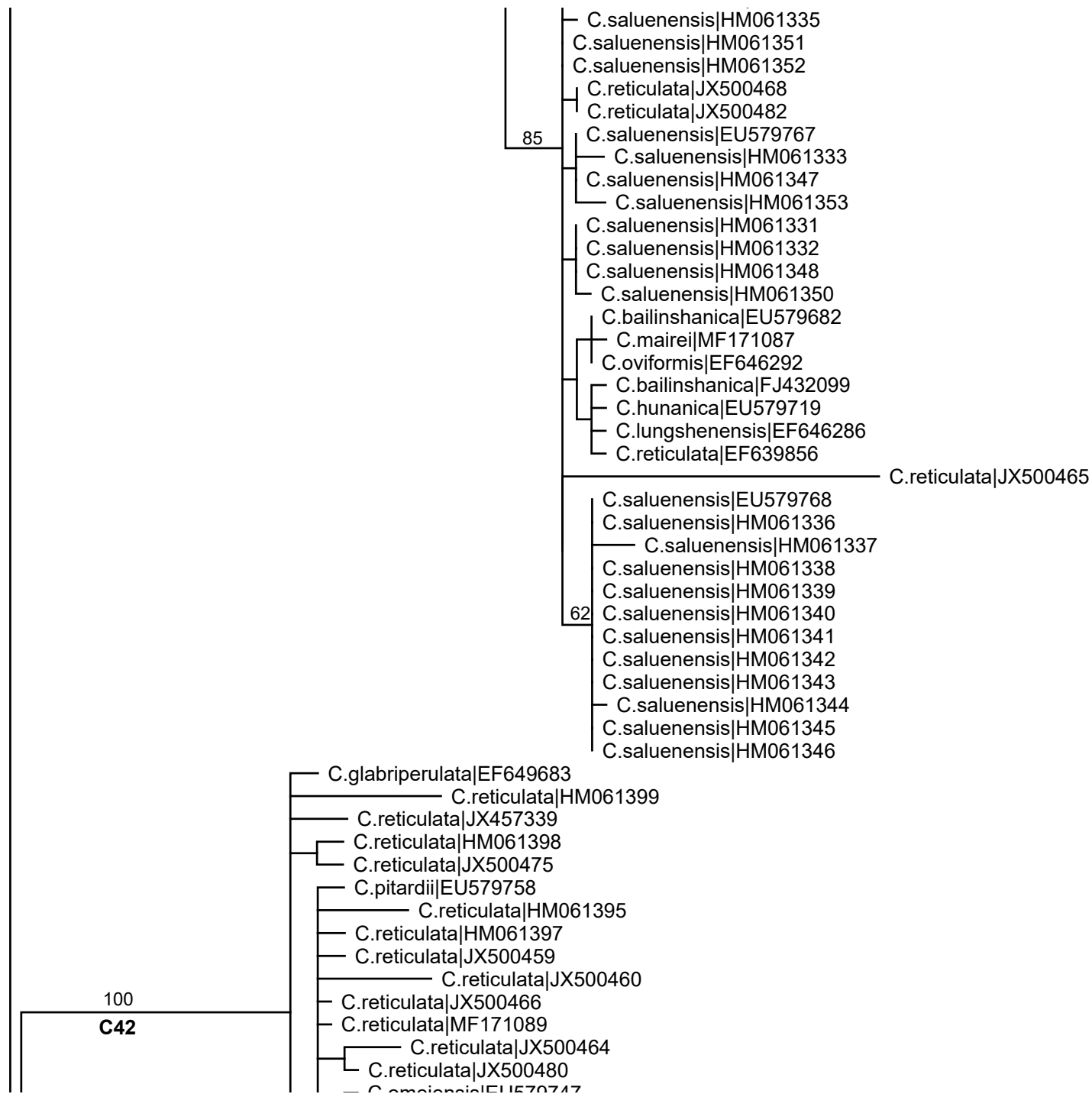


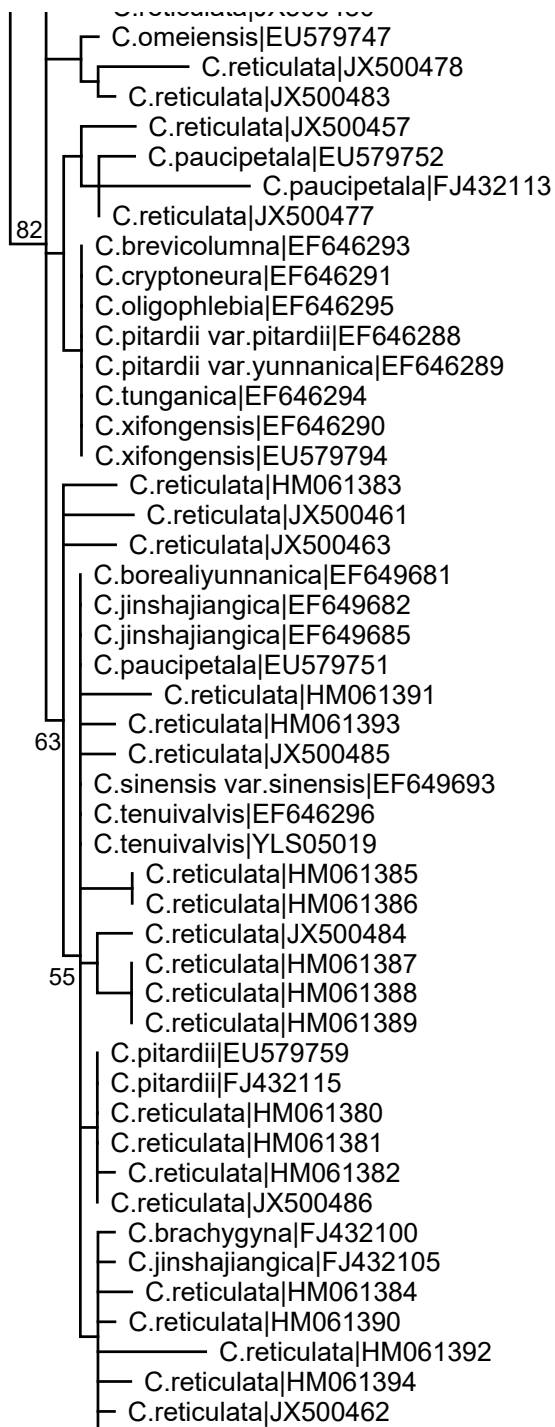


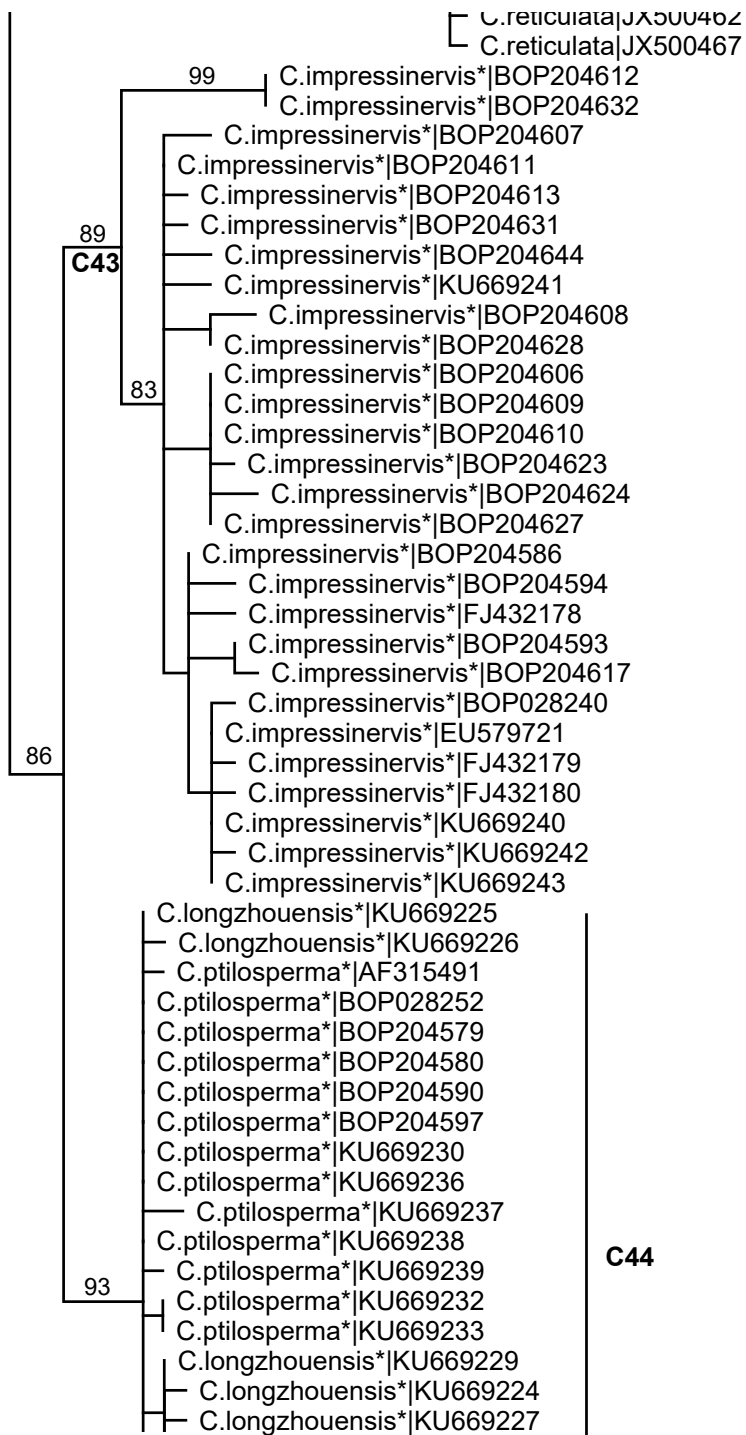












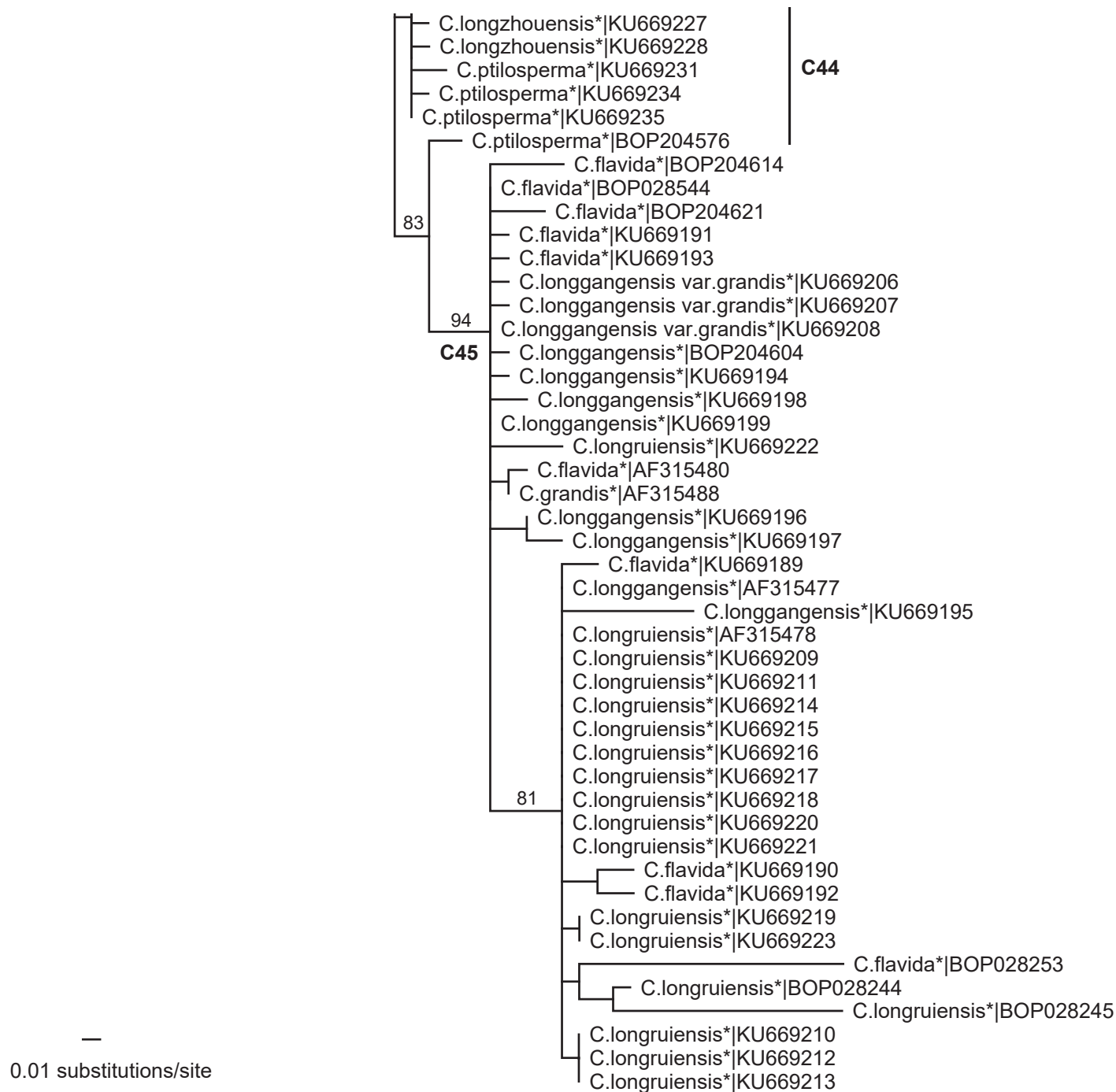
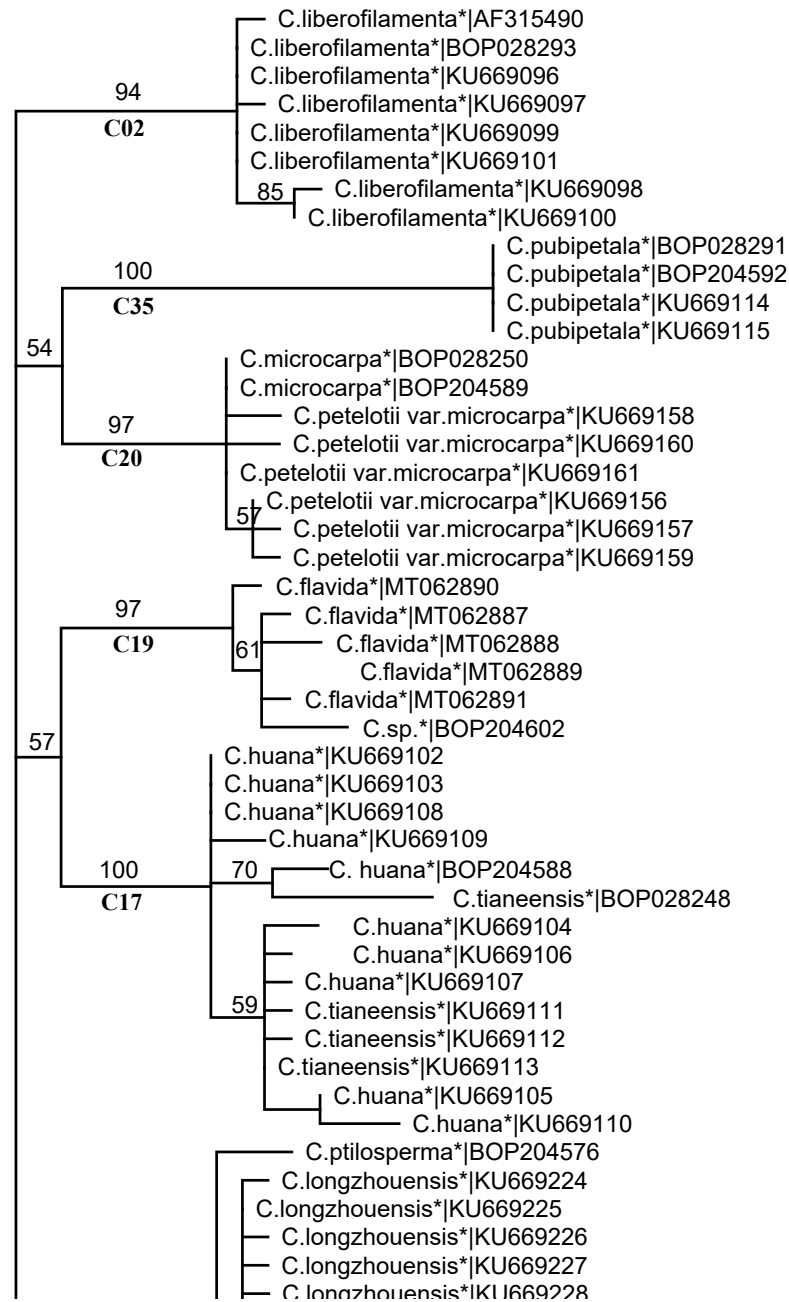
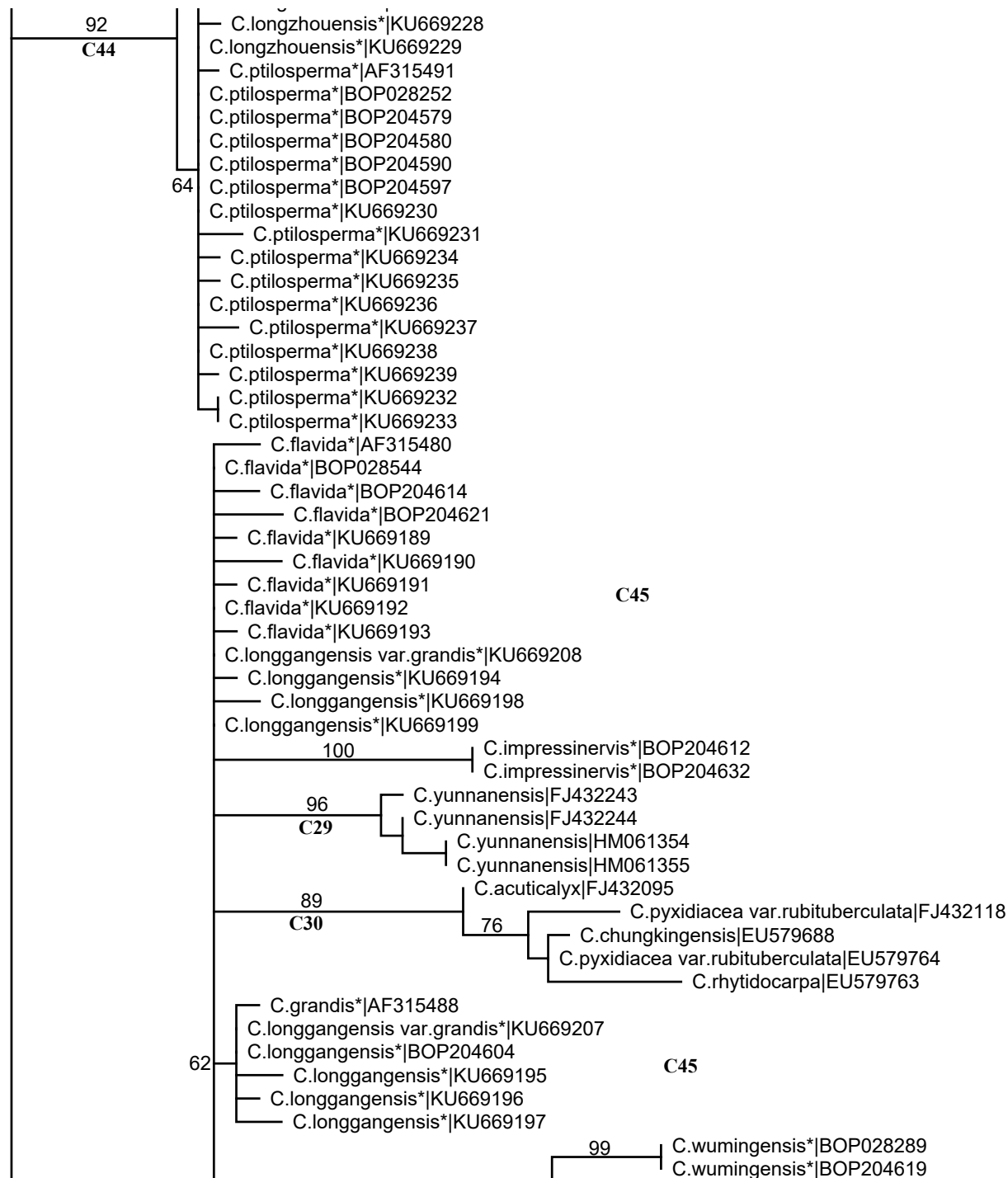


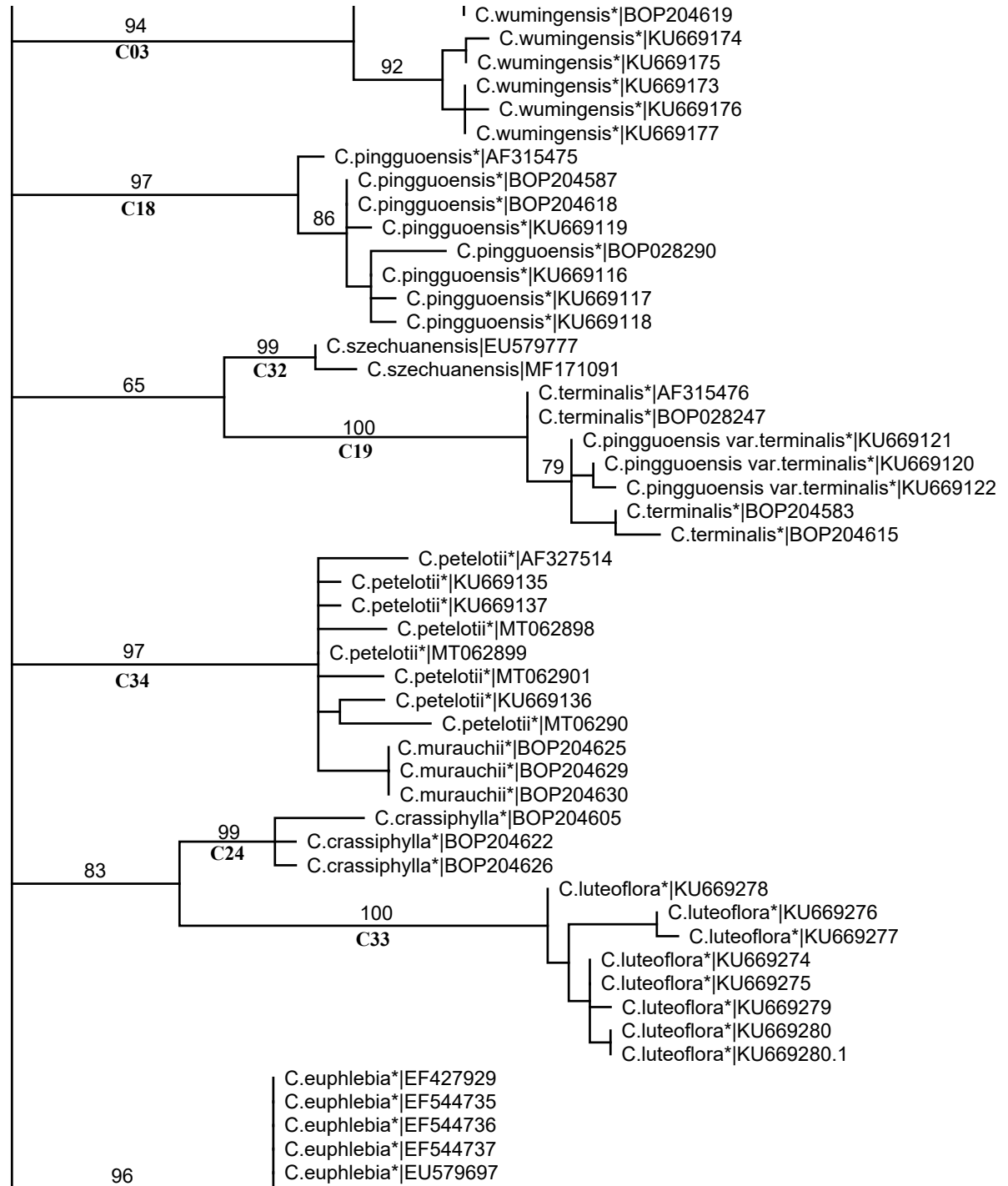
Figure. S3 Strict maximum likelihood tree of 929 ITS sequences of *Camellia* , demonstrating clades and the systematic positions of golden flower camellias in the genus. The golden flower camellias are indicated by *.

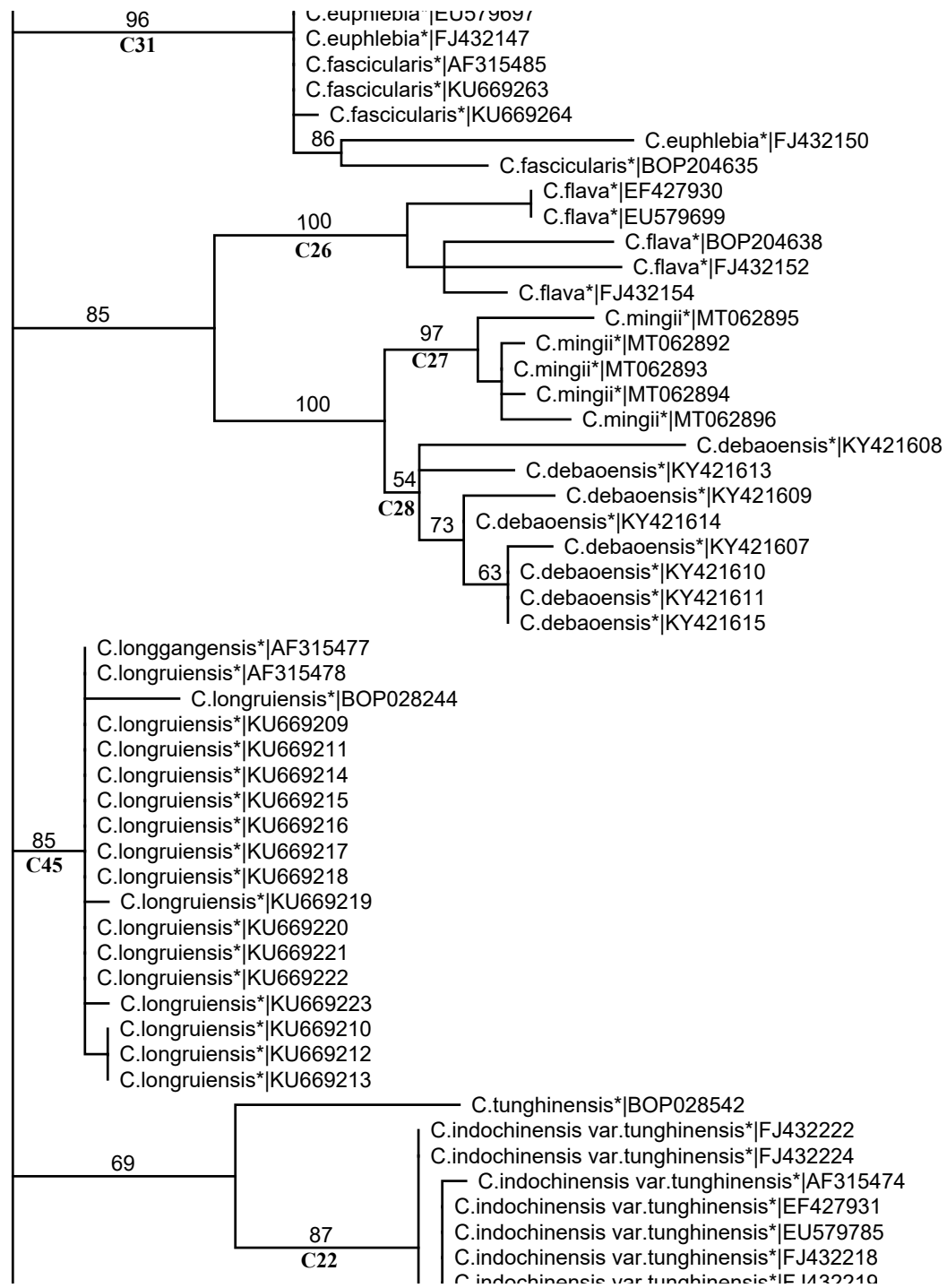
Camellia_pachyandra|EU579748
Camellia_pachyandra|FJ432195

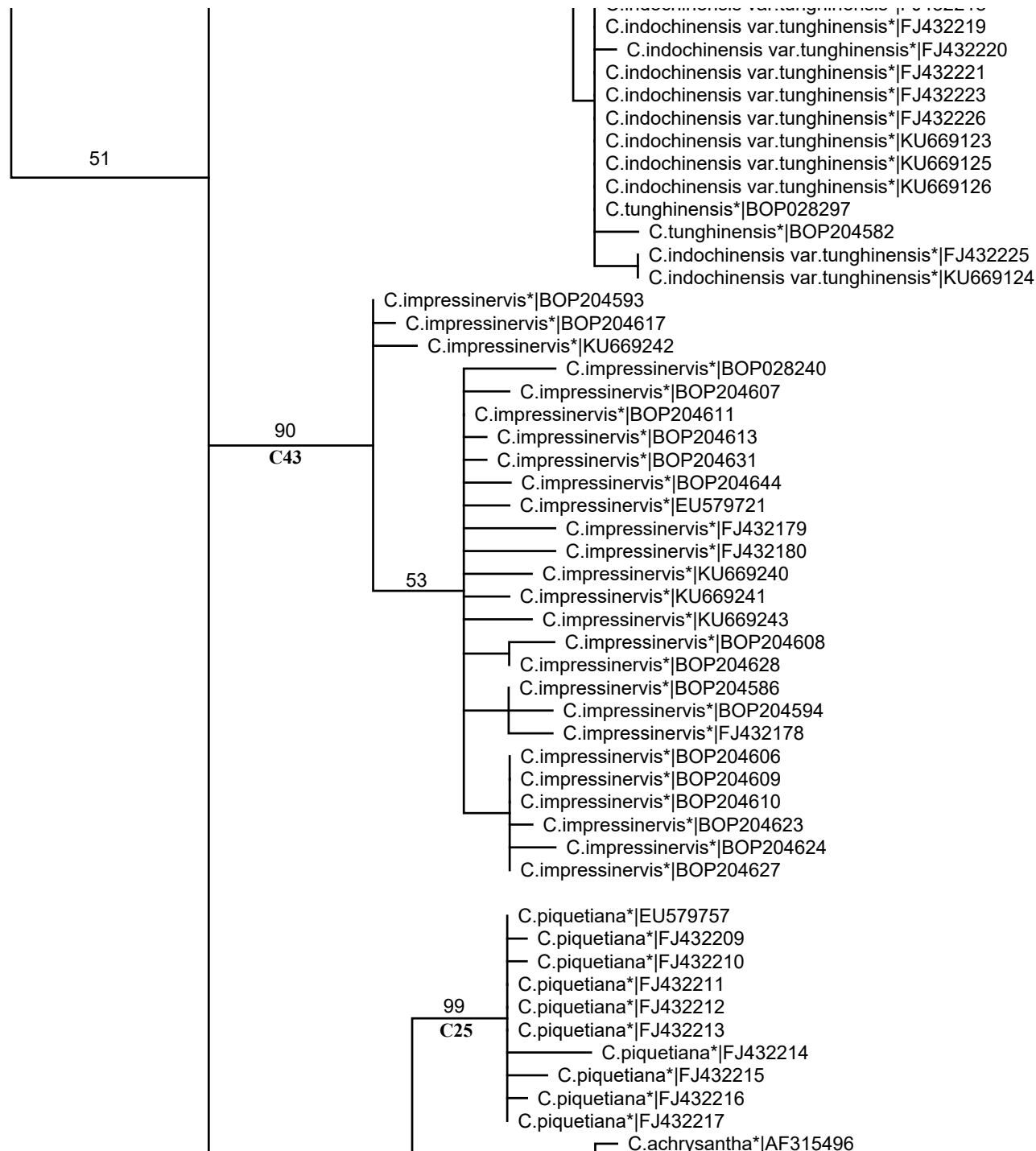


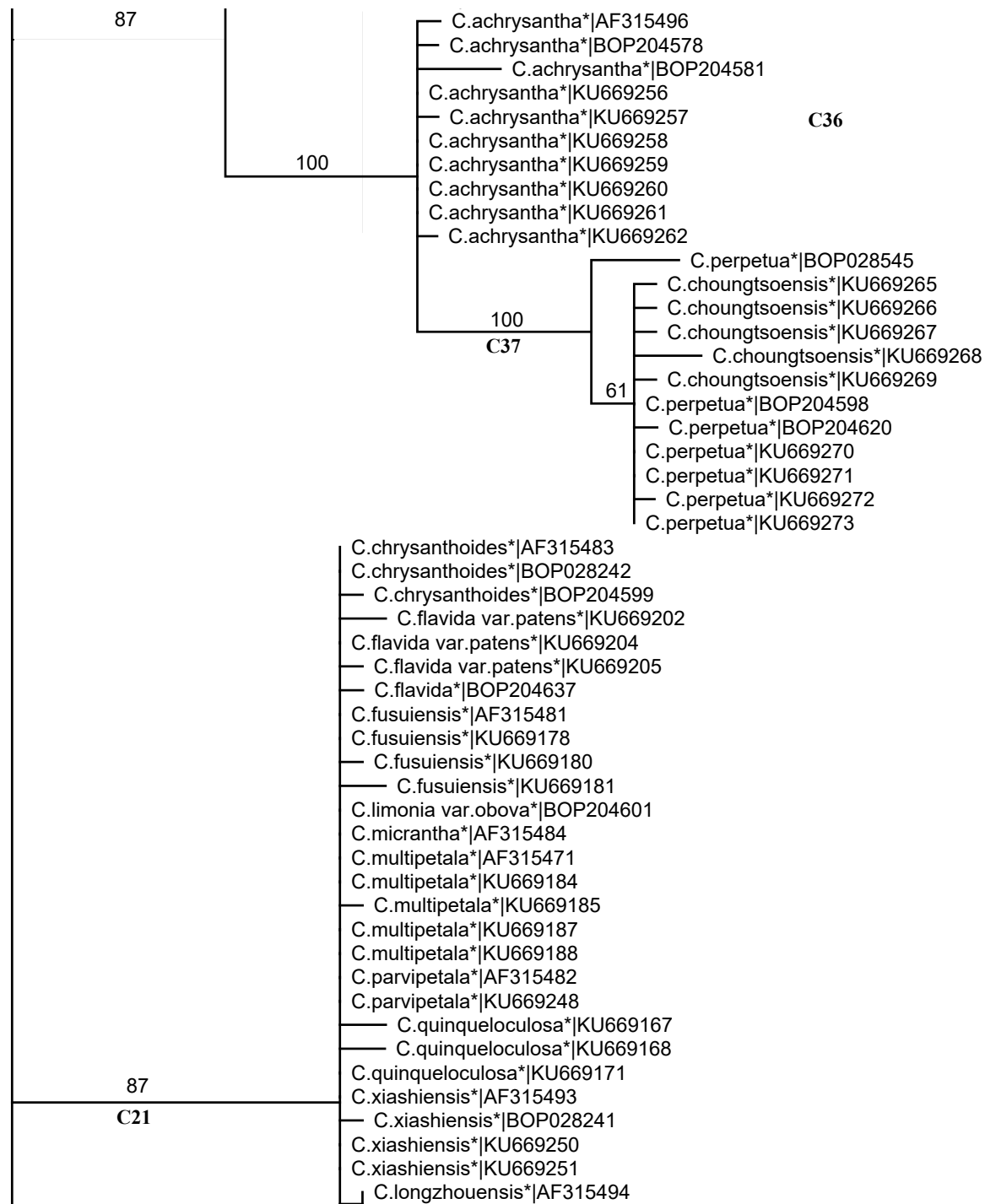


89









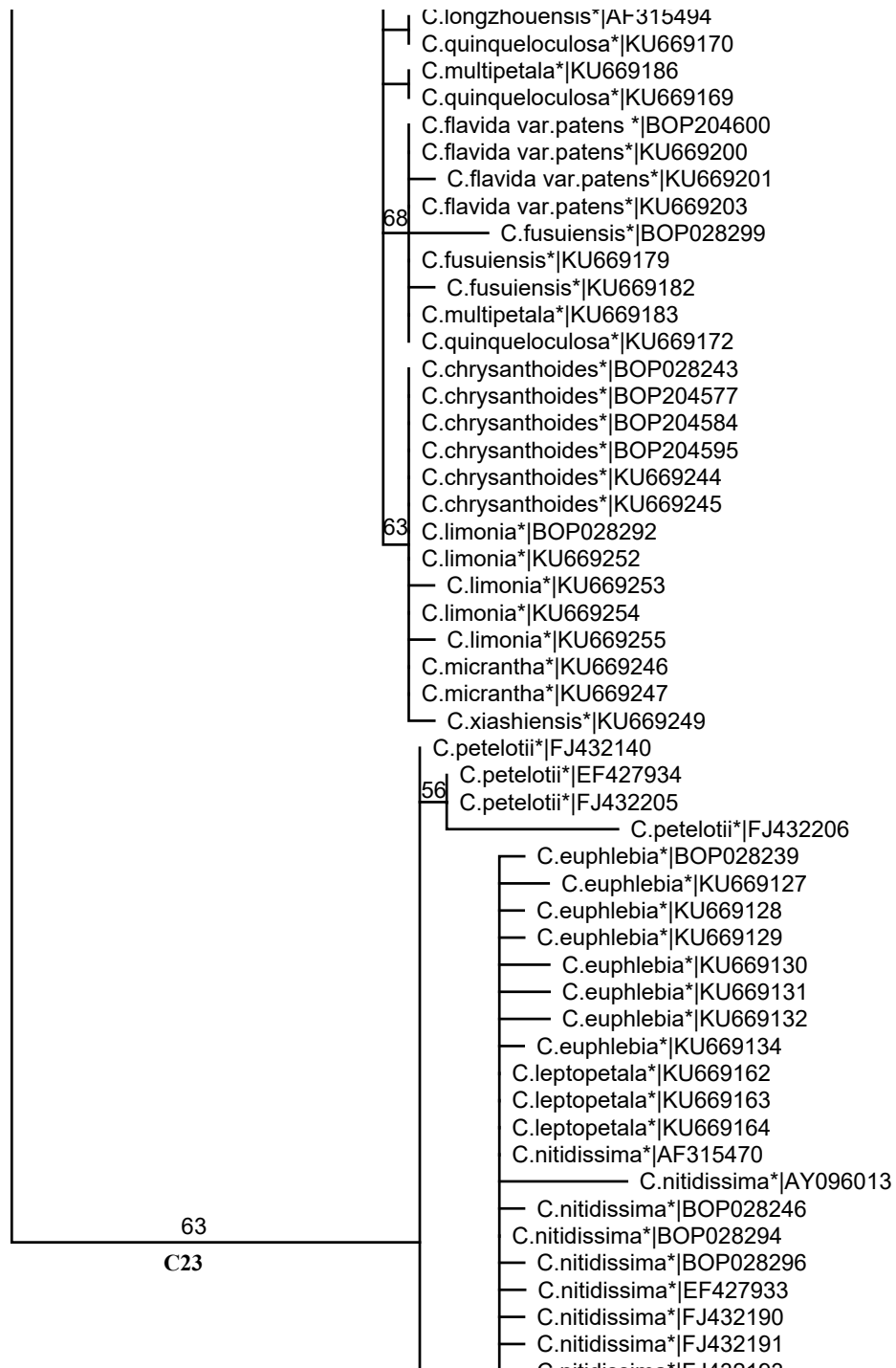




Figure. S4 Strict maximum likelihood tree of 391 ITS sequences of the golden flower camellia species occurring in China and their closely related non-golden flower camellias relatives, demonstrating phylogenetic relationships among species. Different copies of the same sample form a clade except hybrids, indicating reliability of ITS in species identification. The golden flower camellias are indicated by *.

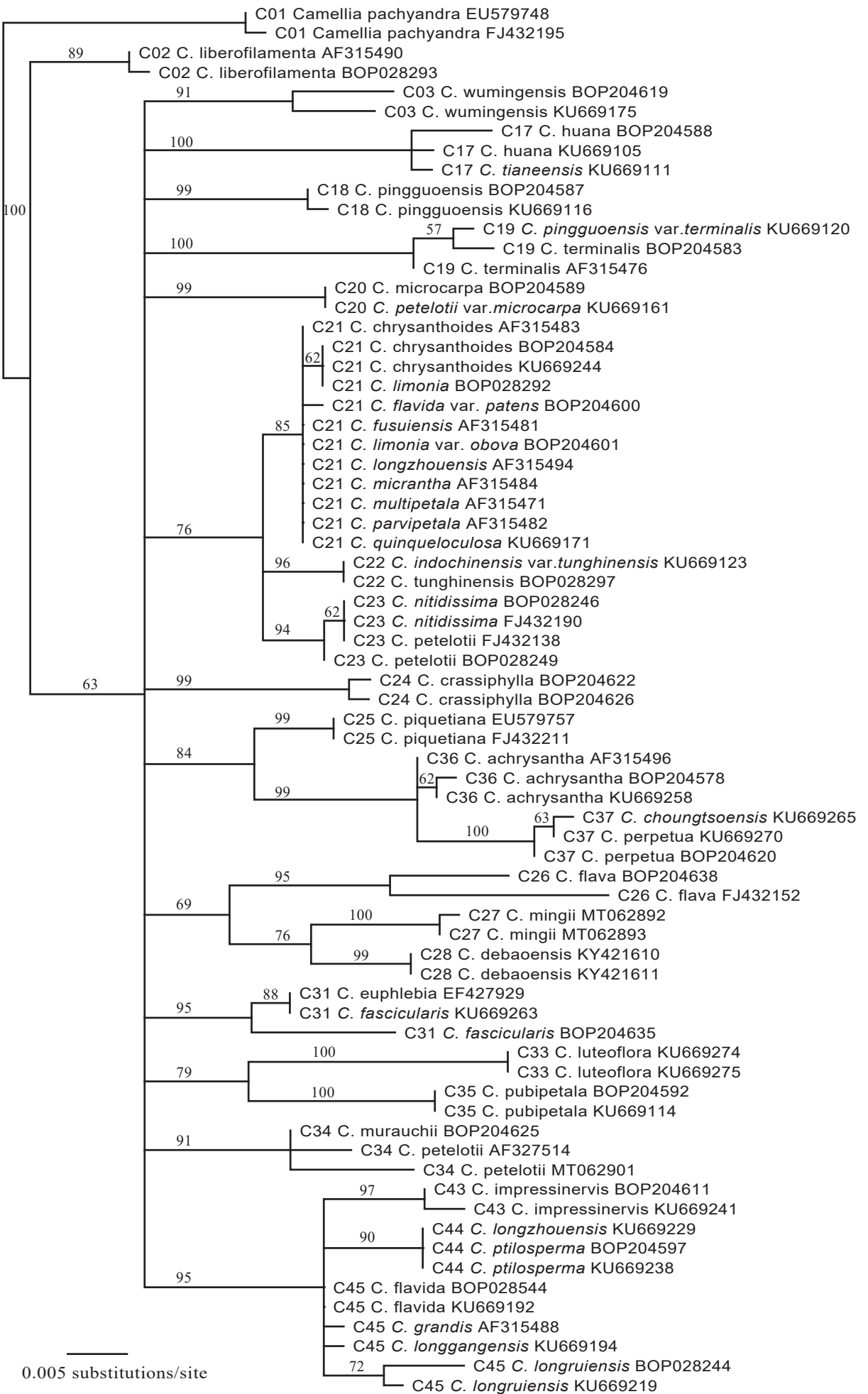
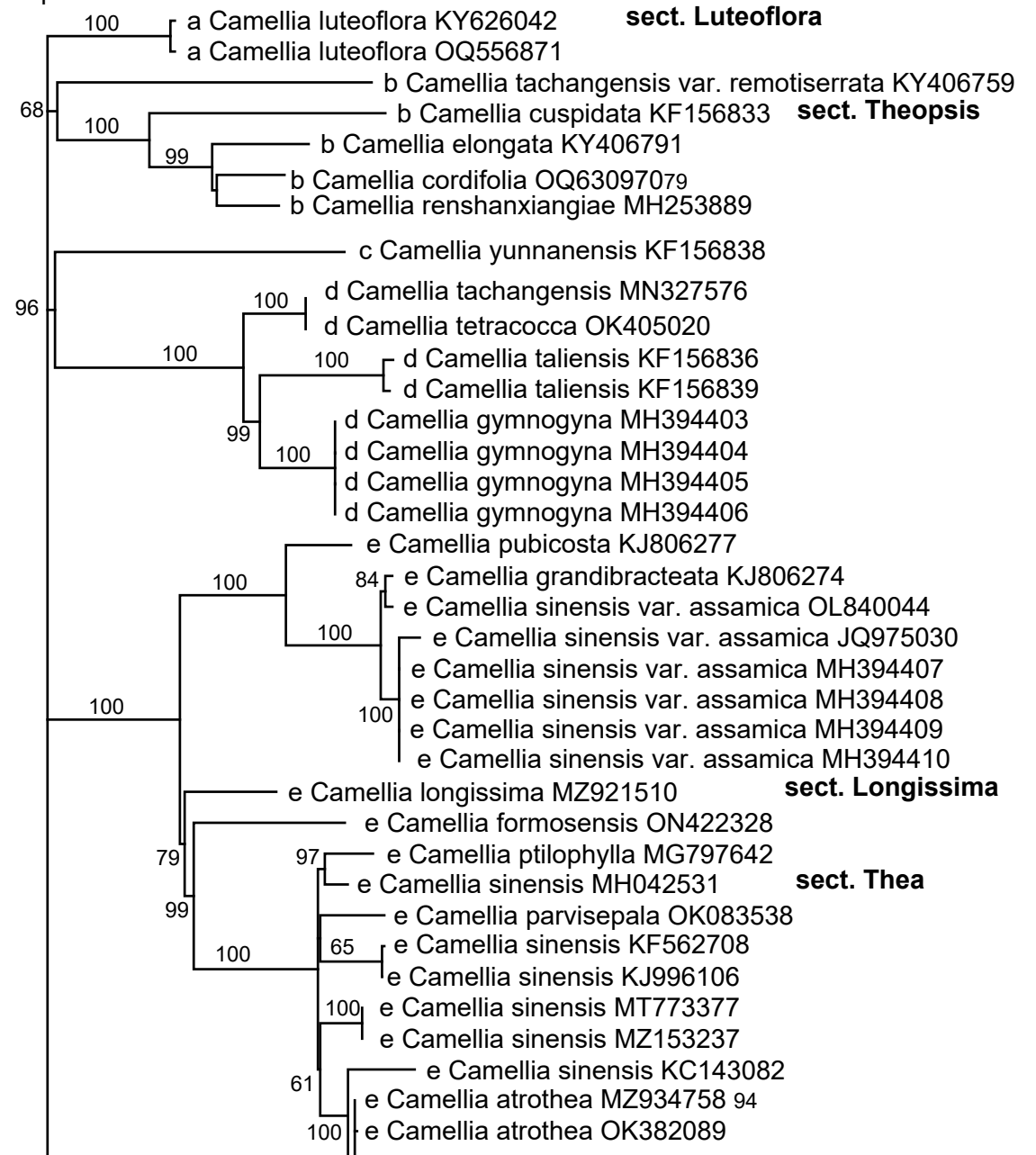
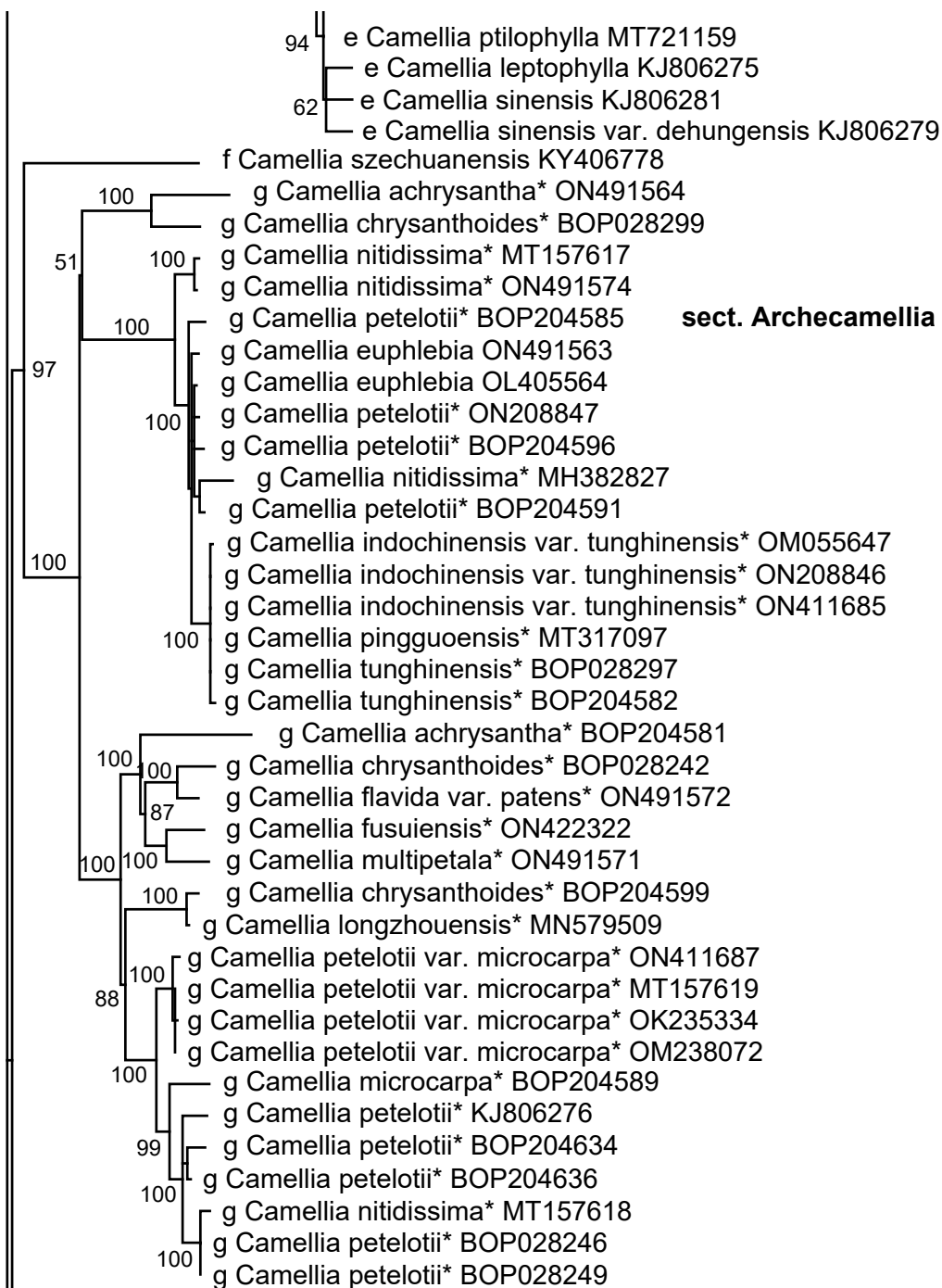


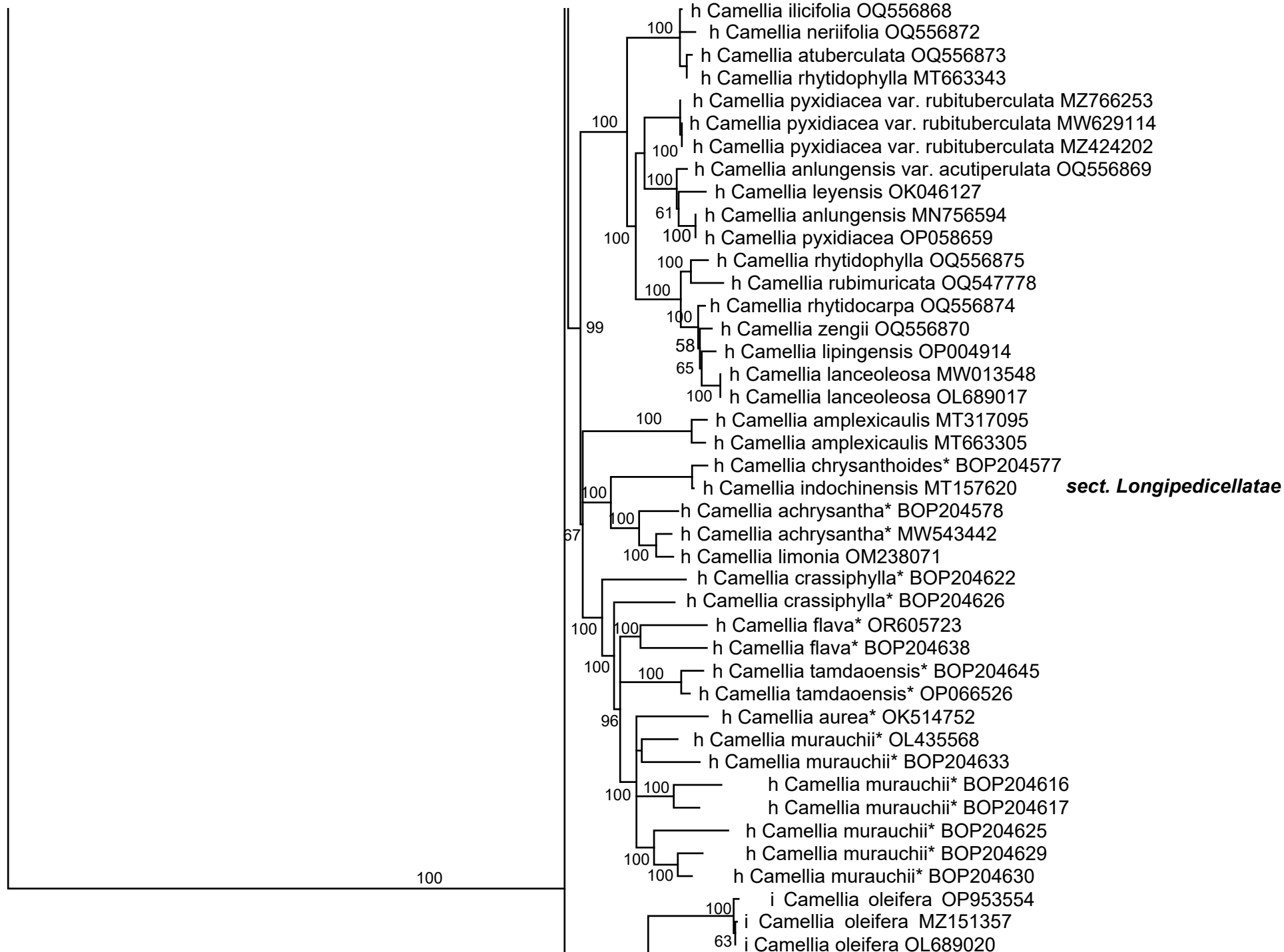
Figure S5 A a concise maximum likelihood tree based on internal transcribed spacer sequences, demonstrating phylogenetic relationships among the golden flower camellia. Synonyms are in *italic*. The clades to which they belong are labeled by a “C” followed by numbers as done in other supporting figures.

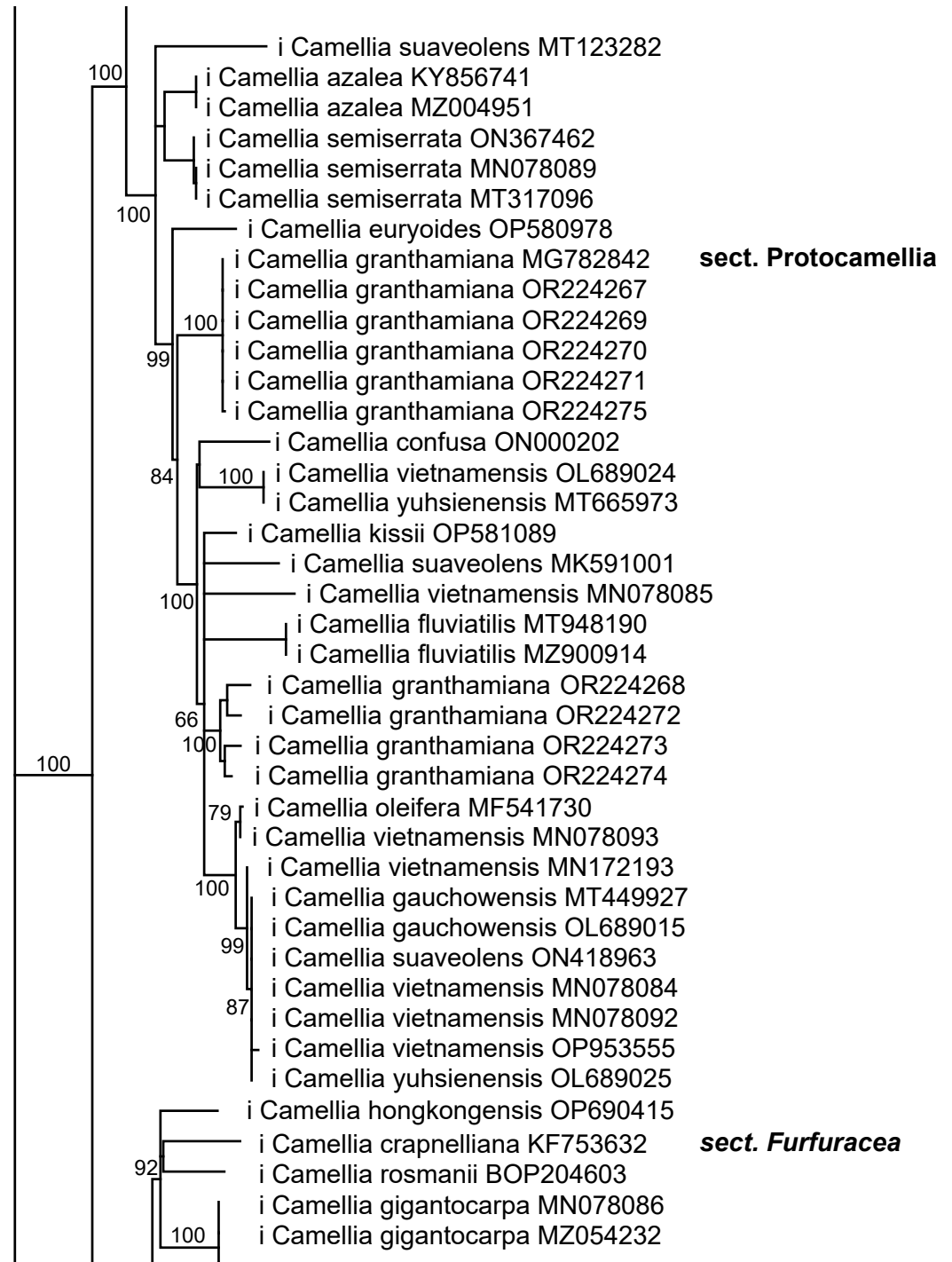
0 *Pyrenaria menglaensis* KY406747

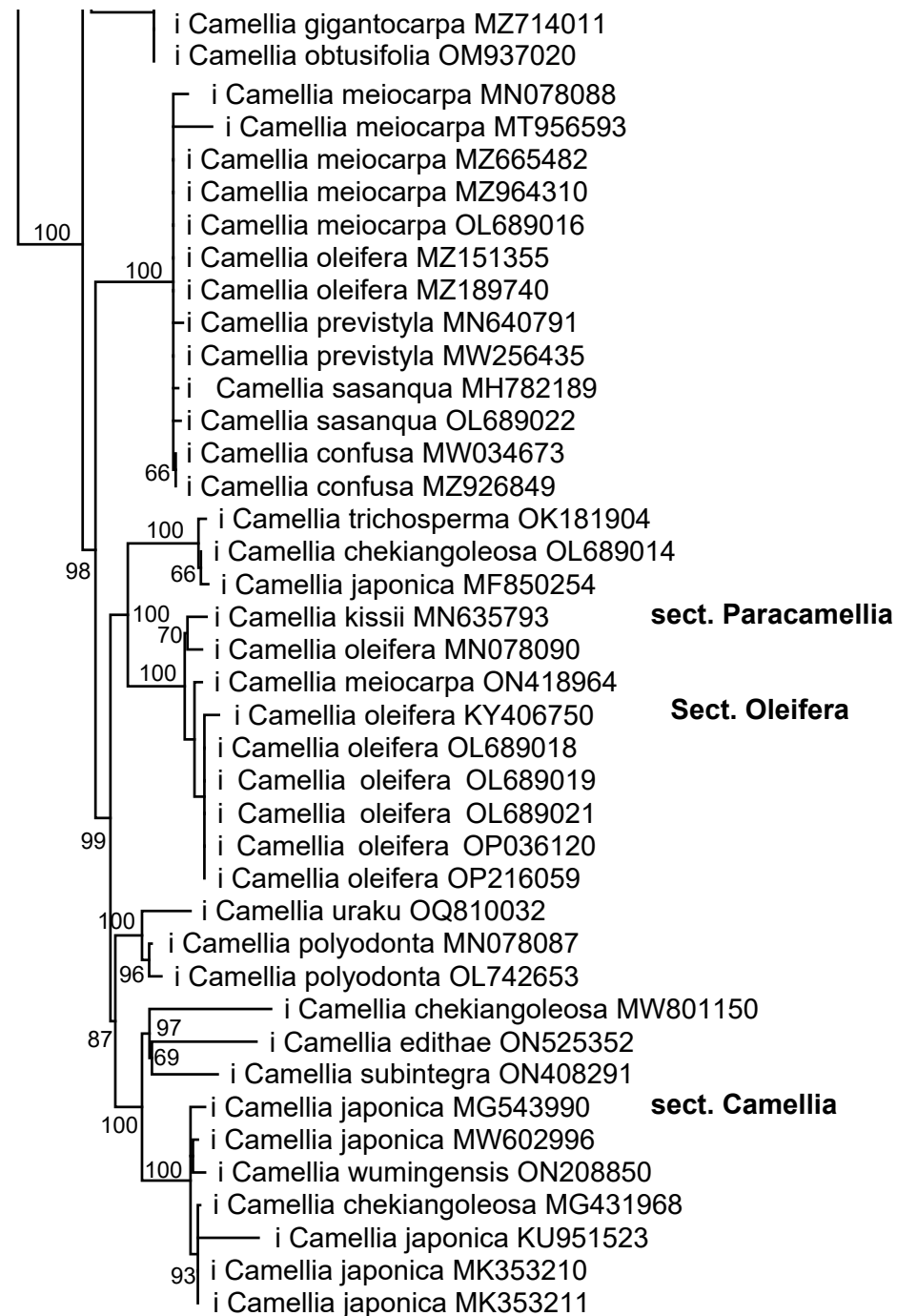
0 *Tutcheria championii* KY406765

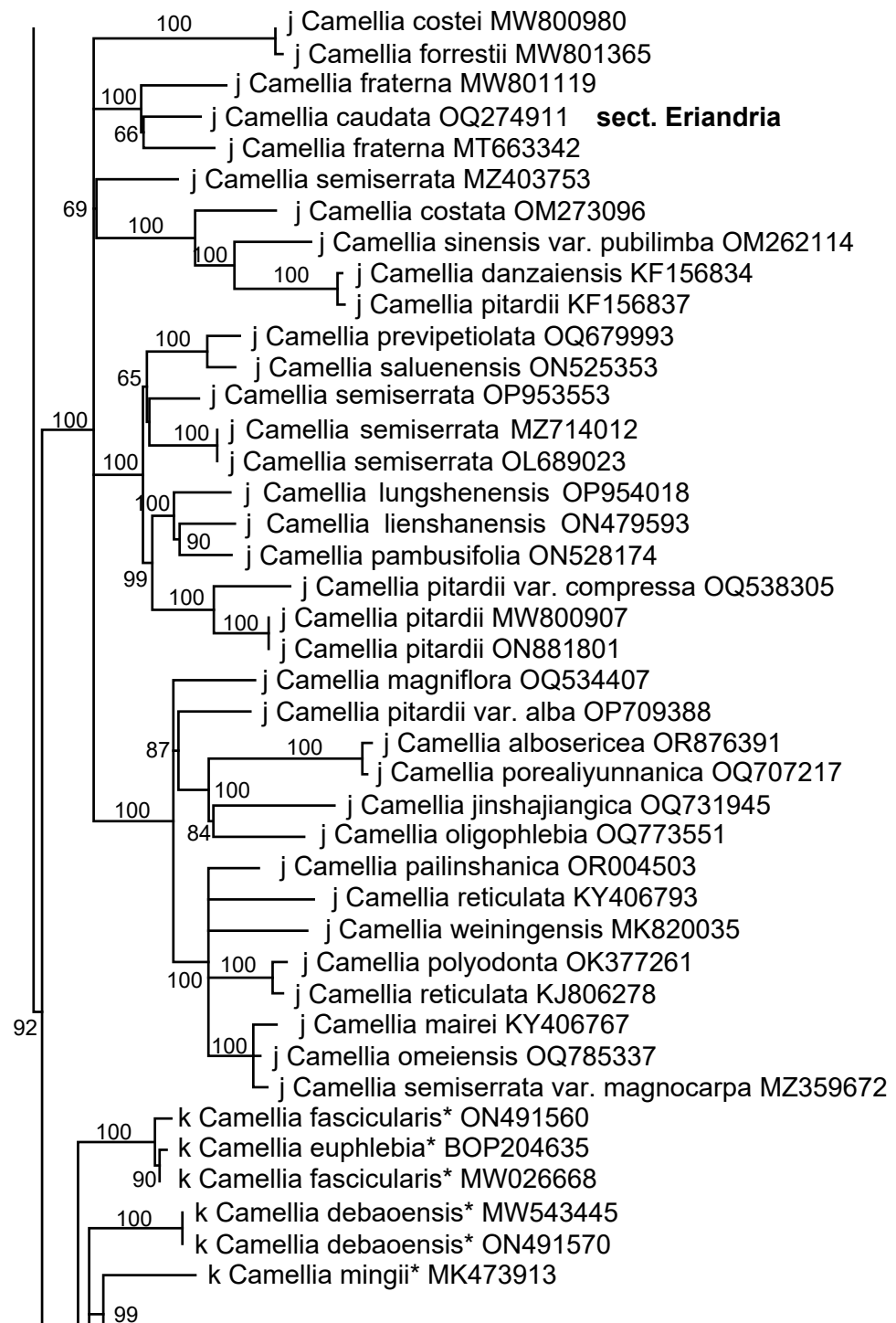


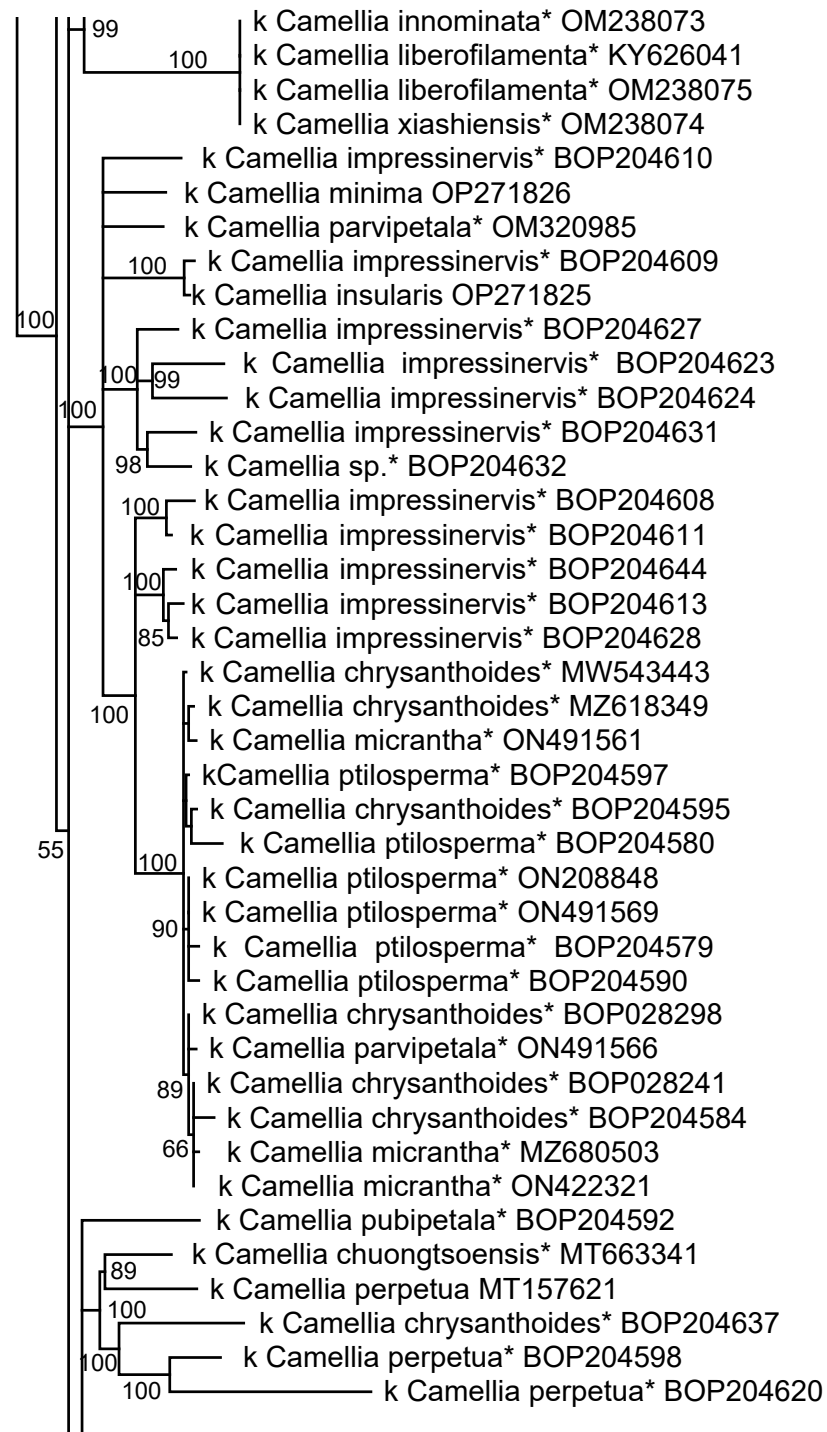


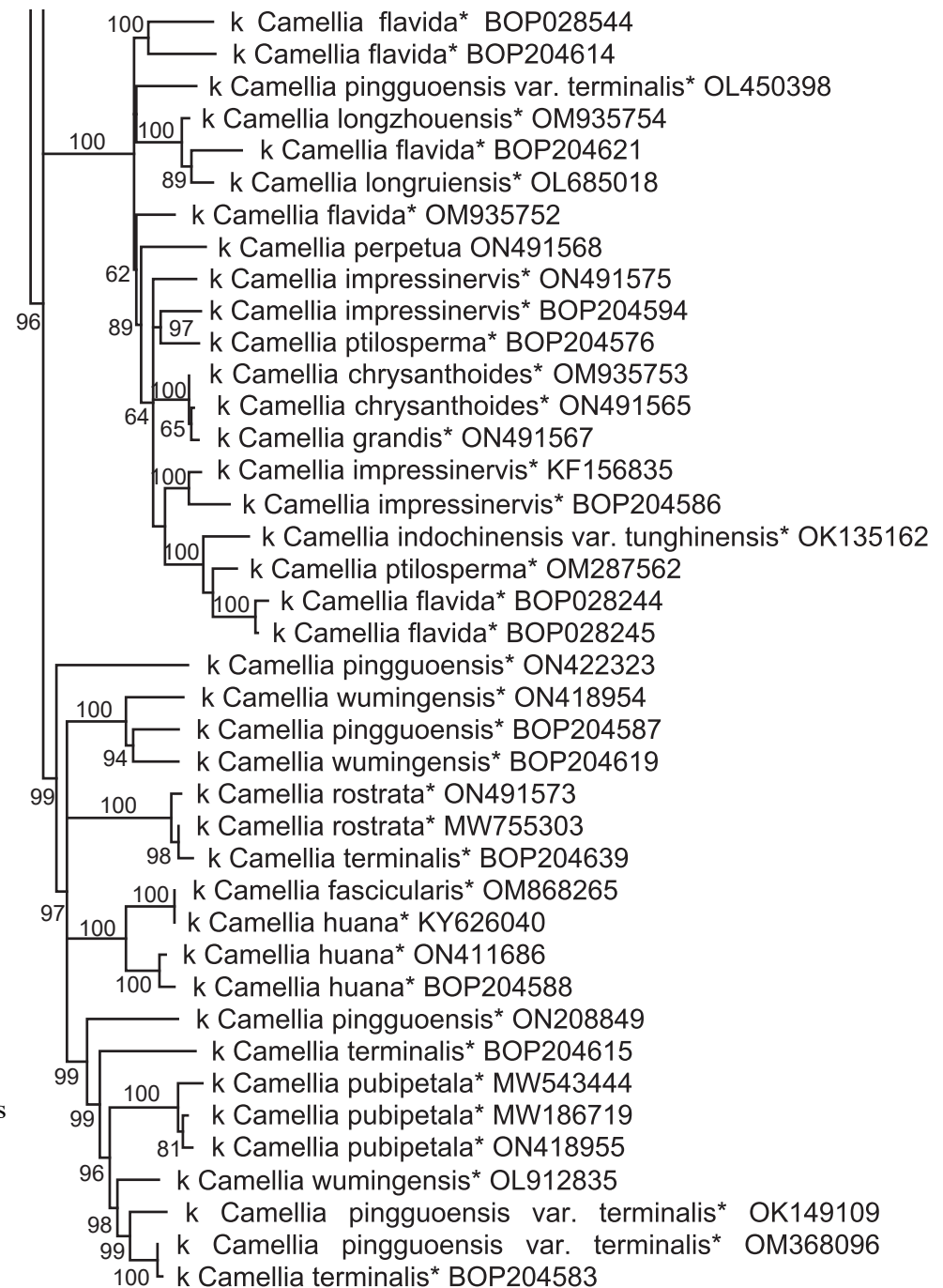












— 5e-005 substitutions/site

Figure. S6 Strict maximum likelihood tree of 322 chloroplast genome sequences *Camellia* species, demonstrating phylogenetic relationships among species and systematic positions of golden flower camellias in the genus. Eleven major clades (labelled as a to k) were revealed and the golden flower camellias scattered in clades g, h, and k. The golden flower camellias are indicated by *.

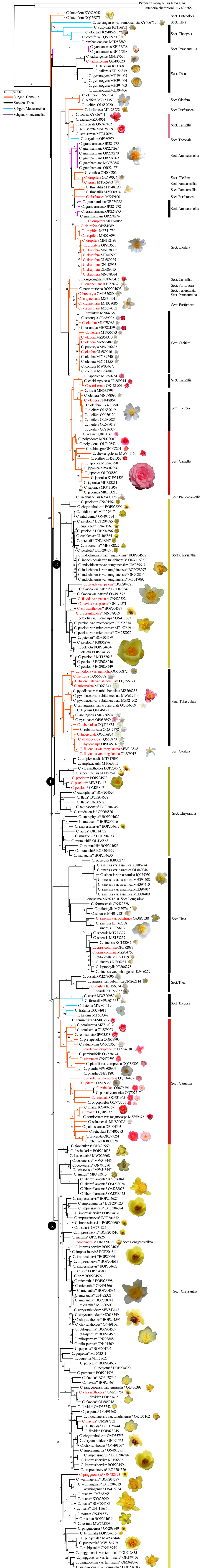


Figure S7 ML phylogenetic relationship and floral color annotation of *Camellia* genus at the species level based on 326 whole chloroplast genomes.

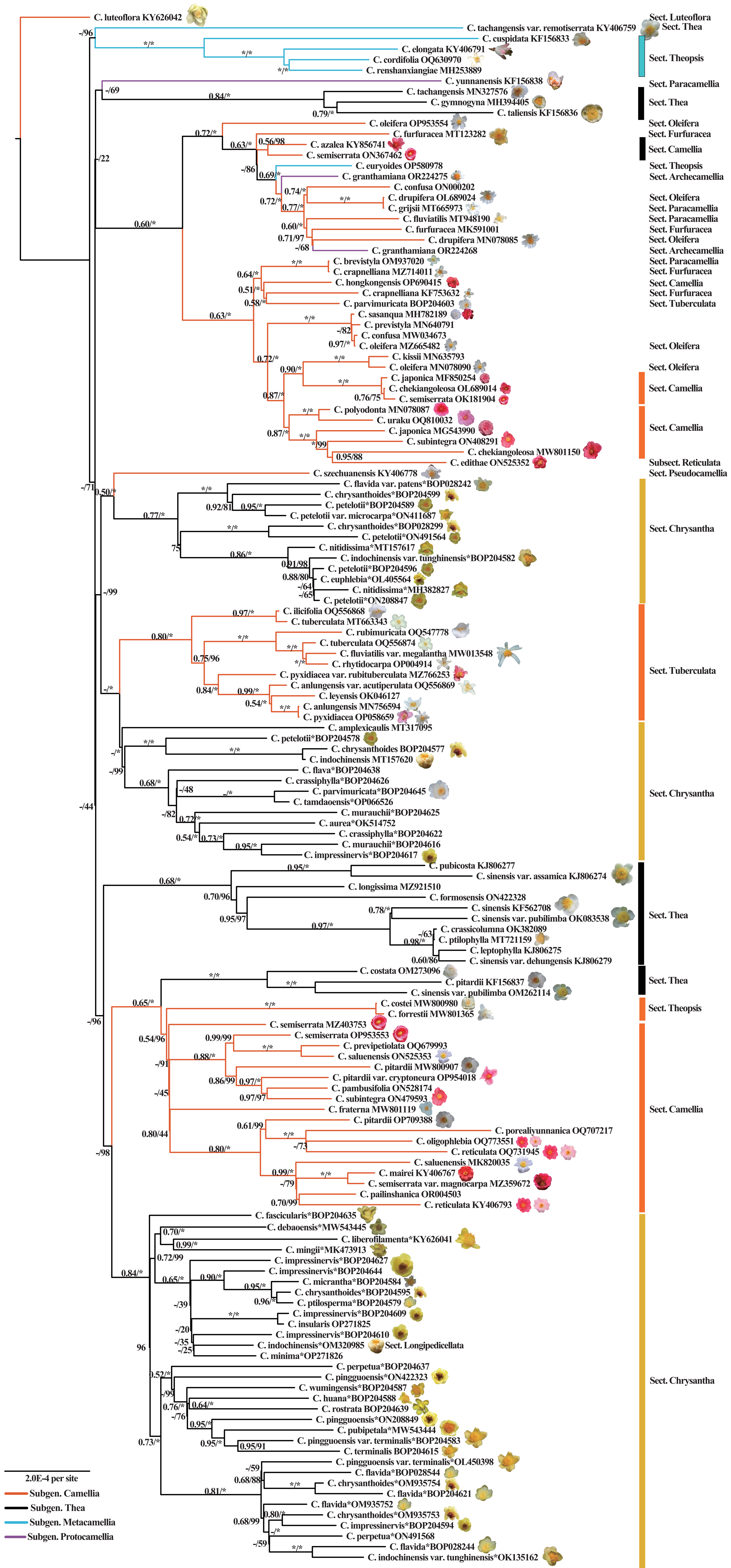


Figure S8 ML and BI phylogenetic relationship and floral color annotation of *Camellia* genus at the species level based on 146 whole chloroplast genomes.

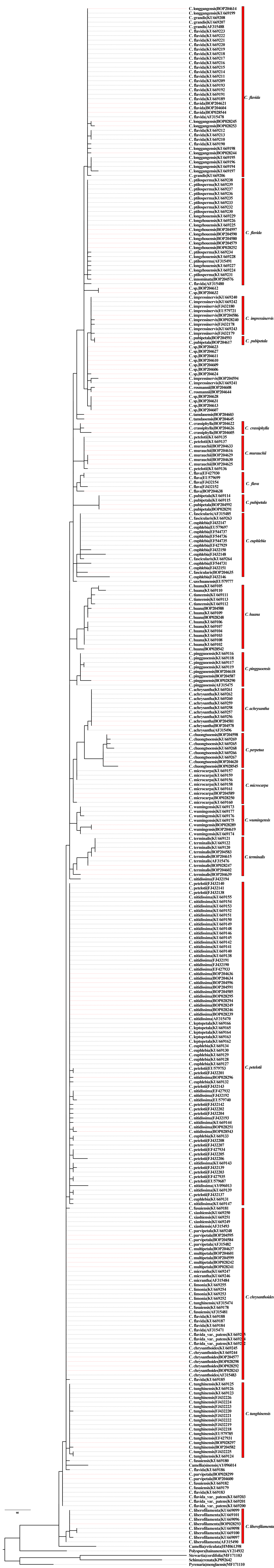


Figure S9 Success identification results of golden *Camellia* species based on ITS ML tree.

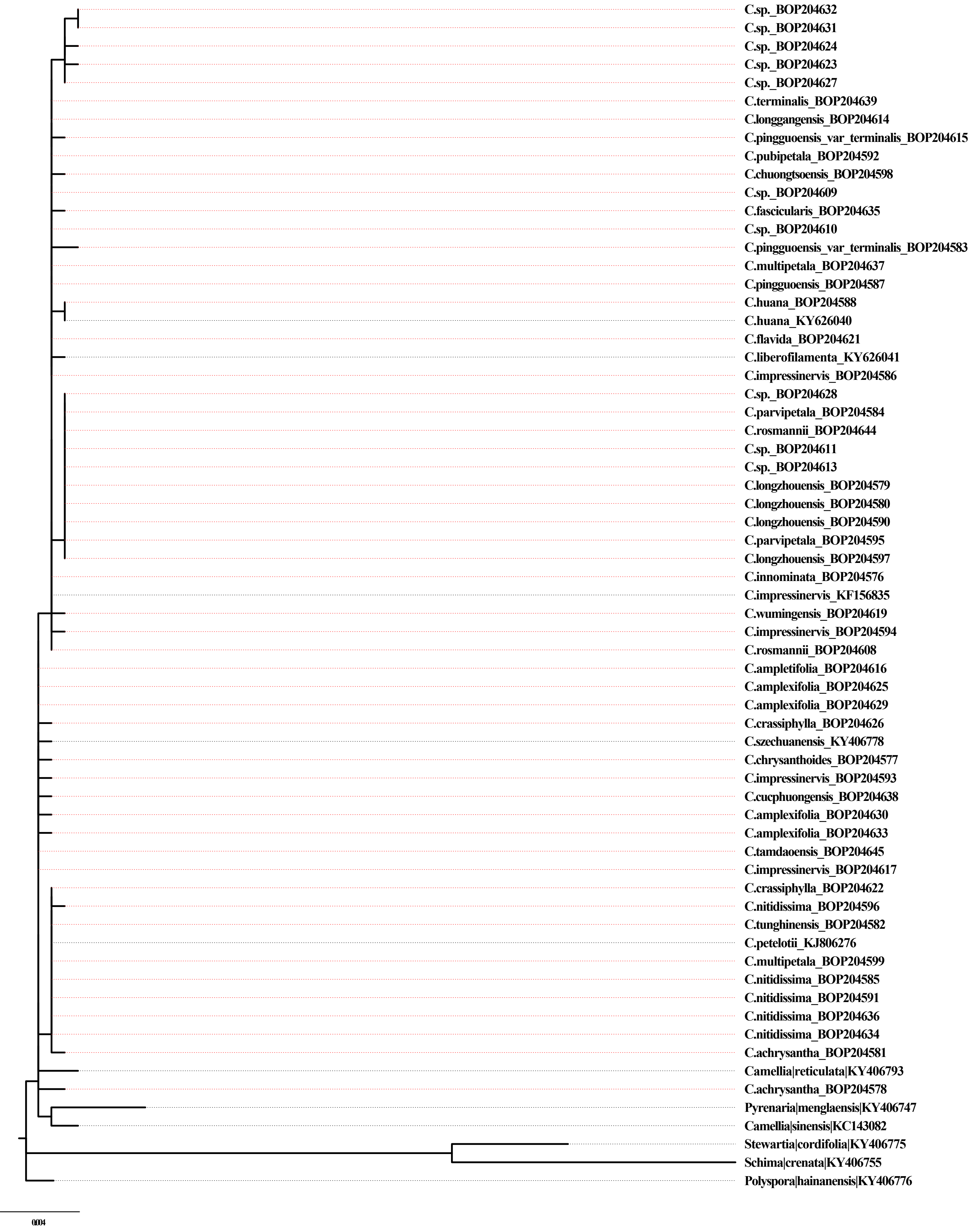


Figure S10 Successful identification of golden *Camellia* species based on *matK* ML tree.

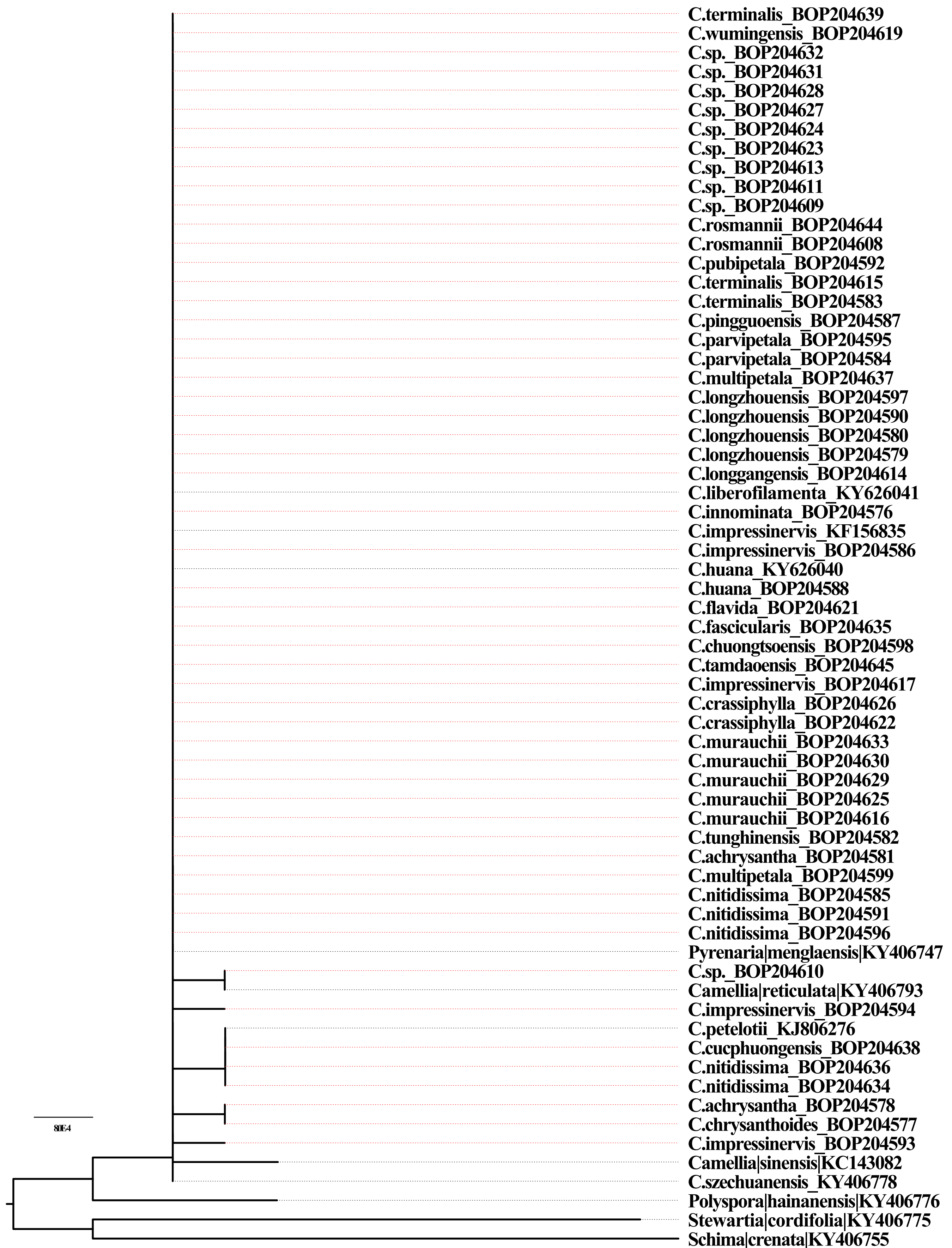


Figure S11 Successful identification of golden *Camellia* species based on rbcL ML tree.

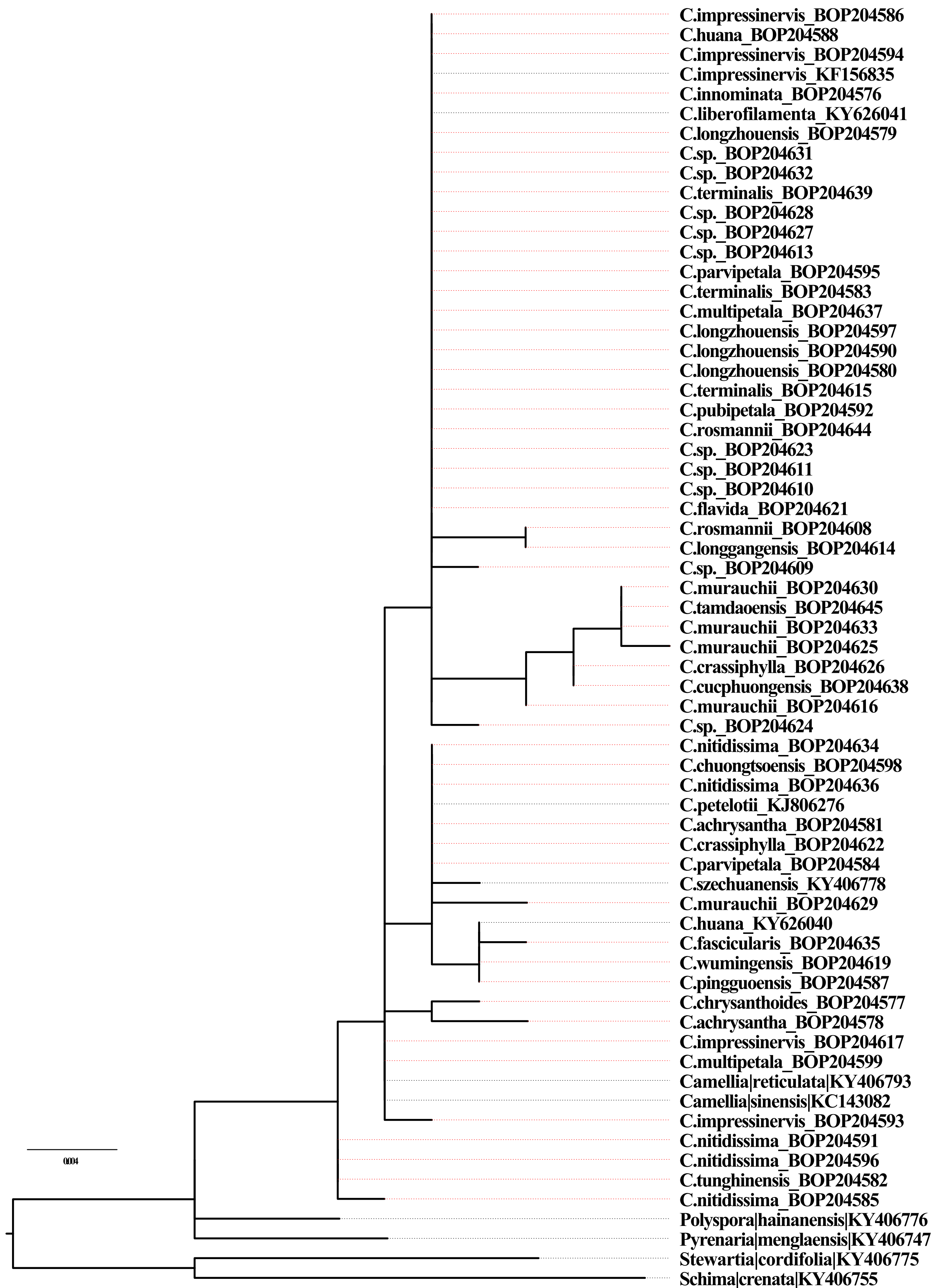


Figure S12 Successful identification of golden *Camellia* species based on trnH-psbA ML tree.

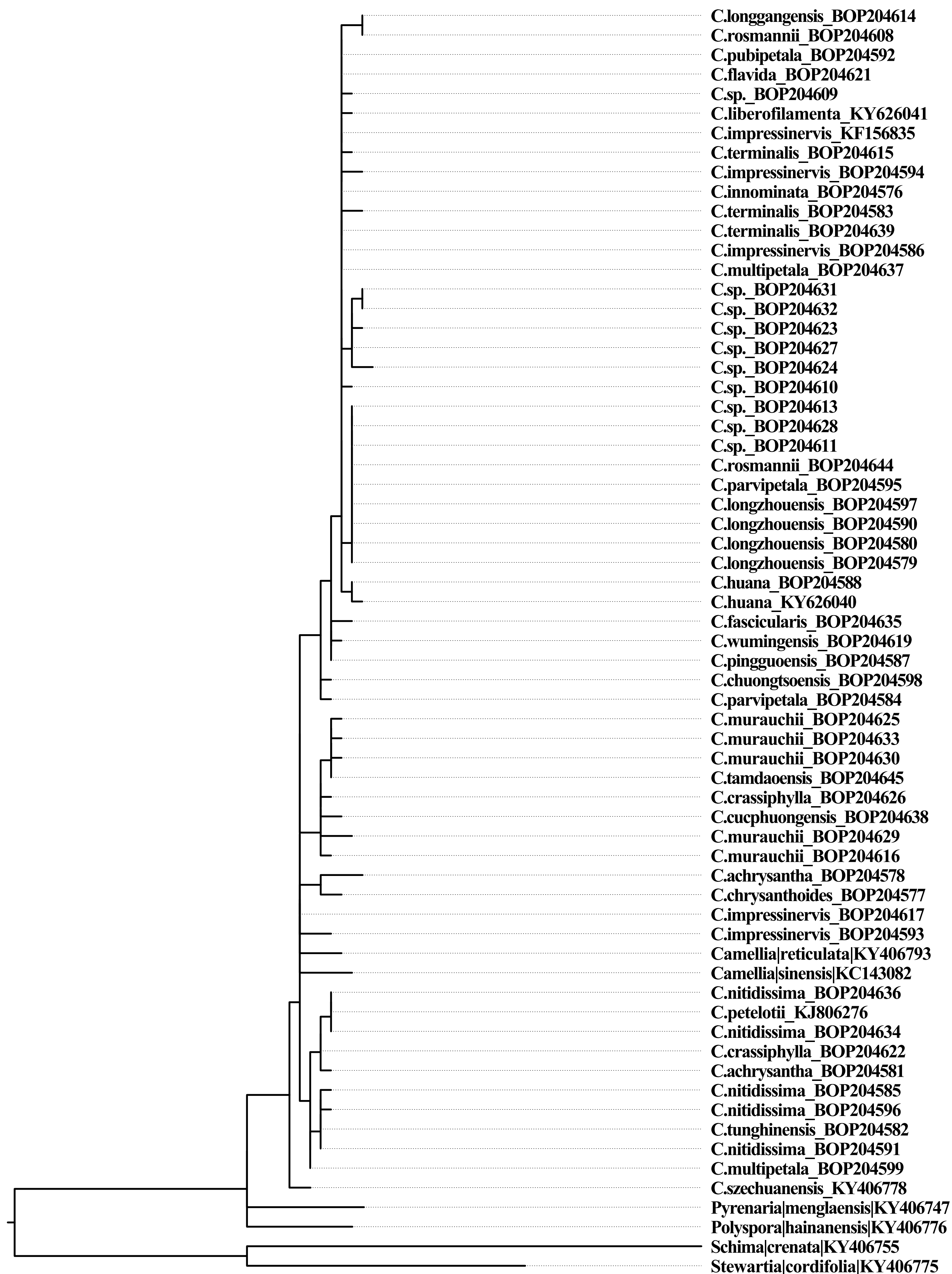


Figure S13 Successful identification of golden *Camellia* species based on ML tree of combination of four universal DNA barcodes.

Table S1. Primers used for amplifying long fragments of golden flower camellia chloroplast genomes.

Forward primer name	Forward primer sequence	Reverse primer name	Reverse primer sequence	Amplicon size
cp003F	GAAACAGGTTACGAATACCAT	cp010R	GCGGGTATAGTTTAGTGGTAAAAG	8 kb
cp009F	CTGGGACGGAAGGATTCGA	cp012R	CACGGATAATATTACTAATTTTCGT	4 kb
cp013F	GATTCCAAATTCAGAGCAATGCCTA	cp018R	GTAATATGAATACCTTTACG	4 kb
cp019F	AGATCCGGGTCACAATTTGTATC	cp025R	AAACTAATGGATGTAAACAAATAGC	5 kb
cp025F	TGTAGGGCTTCTTCGATTTCTCG	cp029R	AATTCTTGACGGTATCGAGCTGG	4 kb
cp030F	GAACTCATTAAAGCCCGATT	cp033R	TCGTAGTATGGGGAAGAAGTGGA	3 kb
cp034F	ATGGATATAGTAAGTCTCGCTTGG	cp038R	GGTTCTACCCCGTGGAACGCTCTT	6 kb
cp040F	ATGAAAACCTTATATTCCCTGAGGAGG	cp045R	CGATGGATTCAATAAGTTCTTGCCA	6 kb
cp046F	TCCTACTGCAATAATTCTTGCTAAG	cp050R	TTCCATTTATCCGCGATCTAGG	5 kb
cp051F	TCAAATCGCACCATCTCTATAATAGGT	cp054R	GTCGGGATAGCTCAGCTGGTAGAGCAG	4 kb
cp055F	GTTCAAGTCCCTCTATCCCCA	cp063R	CTAGCTGCTGCTTGTGAAGTATGGAA	8 kb
cp063F	ATGTCACCACAAACAGAGACTAAAGC	cp066R	TTCTTATTGGTTGGAACCTCC	5 kb
cp067F	ATGAGTTGGCGATCAGAACATATATGG	cp073R	CGTTCTCCTGTGCTTCCAGACAT	5 kb
cp074F	ATCTACTAAATTCATCGAGTTGTTCC	cp080R	CTCGATAAAGTCGGTTGATTAGGA	7 kb
cp081F	GGGAATGCTAGACGTTTGGTAATTTTC	cp084R	TTTGCTATGACTTTTTACTATCG	5 kb
cp085F	AAAGTCTATGATTGGTTCGAAGAACG	cp091R	CGAGAAGTAGAAAGAATTACAA	4 kb
cp092F	CCATATATAACACAAAATTTCTCC	cp098R	CCCGAATTTGGAGTATCCTAC	6 kb
cp096R	AGCCAACACTTAGATCCGGCTCTAC	cp002R	GGCTTTCGCTTTCGCGTCTCTCT	2 kb

Forward primer name	Forward primer sequence	Reverse primer name	Reverse primer sequence	Amplicon size
cp099F	ATGAAAGGACATCAATTCAAATCCTGG	cp105R	GGTCATTTTCGGGGCAAGCGGATC	6 kb
cp106F	CCAAGGAATCCGTTAGATATGATGCA	cp108R	TATACGTCAGGAGTCCATT	3 kb
cp110F	GCAACGACTGGAGTGGGAGA	cp112R	CAGTTCGAGCCTGATTATCCC	5 kb
cp113F	GAGTGTCACCTTGACGTGG	cp119R	GGACAGAAAGACCCTATGAAGCTT	6 kb
cp120F	CACAGGTCTCCGCAAAGTCGTAAG	cp125R	CCAACATCATTAAGAATTTTCATCTT	5 kb
cp126F	GTAAATAGATCCGAAACATATAAAATG	cp131R	TGTTAACCAAGGAAAATAATTCGT	6 kb
cp130F	CGCGATTTATTTACATACTCGAAC	cp138R	GTGCAATTCCAAATGTGAAGTA	8 kb
cp138F	GTTATTGCTTCTGTGAACATAGTA	cp123F	CTCCCCAAGTAGGATTTCGAAC	8 kb

Table S2. Genome features of 64 newly determined chloroplast genomes of golden flower camellias (*Camellia*).

Taxon	Nursery label	Voucher	LSC	IRb	SSC	IRa	Length	CDS	rRNA	tRNA	Genes
<i>C. achrysantha</i>	<i>C. achrysantha</i>	BOP204578	86240	26083	18237	26083	156643	87	8	37	132
<i>C. achrysantha</i>	<i>C. micrantha</i>	BOP204581	86689	26096	18252	26090	157127	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. xiashiensis</i>	BOP028241	86565	26064	18267	26064	156960	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. multipetala</i>	BOP028242	86635	26054	18300	26046	157035	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. micrantha</i>	BOP028298	86565	26054	18277	26054	156950	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. fusuiensis</i>	BOP028299	86589	26120	18140	26134	156983	87	8	37	132
<i>C. chrysanthoides</i>	<i>C. limonia</i>	BOP204577	86248	26053	18219	26053	156573	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. chrysanthoides</i>	BOP204584	86632	26090	18291	26090	157103	87	8	37	132
<i>C. chrysanthoides</i>	<i>C. parvipetala</i>	BOP204595	86580	26064	18267	26064	156975	86	8	37	131
<i>C. chrysanthoides</i>	<i>C. longzhouensis</i>	BOP204599	86626	26090	18275	26090	157081	87	8	37	132
<i>C. chrysanthoides</i>	<i>C. flavida</i>	BOP204637	86442	26034	18215	26034	156725	86	8	37	131
<i>C. crassiphylla</i>	<i>C. crassiphylla</i>	BOP204622	86159	26088	18268	26088	156603	87	8	37	132
<i>C. crassiphylla</i>	<i>C. sp.</i>	BOP204626	86203	26071	18281	26071	156626	87	8	37	132
<i>C. euphlebia</i>	<i>C. fascicularis</i>	BOP204635	86468	26049	18259	26058	156834	87	8	37	132
<i>C. euphlebia</i>	<i>C. tamdaoensis</i>	BOP204645	86235	26115	18284	26115	156749	87	8	37	132

<i>C. flava</i>	<i>C. cucphuongensis</i>	BOP204638	86240	26001	18277	26001	156519	87	8	37	132
<i>C. flavida</i>	<i>C. longzhouensis</i>	BOP028244	86585	25965	18330	25965	156845	86	8	37	131
<i>C. flavida</i>	<i>C. longruiensis</i>	BOP028245	87431	26041	18254	26041	157767	86	8	37	131
<i>C. flavida</i>	<i>C. longgangensis</i>	BOP028544	86559	26023	18250	26016	156848	86	8	37	131
<i>C. flavida</i>	<i>C. longgangensis</i>	BOP204614	86419	26046	18260	26046	156771	86	8	37	131
<i>C. flavida</i>	<i>C. parvifolia</i>	BOP204621	86603	25938	18252	25938	156731	87	8	37	132
<i>C. huana</i>	<i>C. tianeensis</i>	BOP204588	86577	26061	18205	26061	156904	87	8	37	132
<i>C. impressinervis</i>	<i>C. impressinervis</i>	BOP204586	86559	26059	18238	26059	156915	86	8	37	131
<i>C. impressinervis</i>	<i>C. pubipetala</i>	BOP204593	86641	26093	18287	26093	157114	87	8	37	132
<i>C. impressinervis</i>	<i>C. impressinervis</i>	BOP204594	86617	26059	18255	26059	156990	86	8	37	131
<i>C. impressinervis</i>	<i>C. rosmannii</i>	BOP204603	86647	25925	18401	25925	156898	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204608	86424	26049	18265	26049	156787	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204609	86562	26040	18245	26040	156887	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204610	86620	26046	18268	26046	156980	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204611	86585	26049	18265	26049	156948	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204613	86579	26046	18265	26046	156936	86	8	37	131
<i>C. impressinervis</i>	<i>C. pubipetala</i>	BOP204617	86212	26061	18275	26061	156609	87	8	37	132
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204623	86599	26047	18252	26046	156944	86	8	37	131

<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204624	86584	26059	18250	26058	156951	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204627	86577	26065	18260	26064	156966	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204628	86579	26065	18267	26064	156975	86	8	37	131
<i>C. impressinervis</i>	<i>C. sp.</i>	BOP204631	86565	26065	18259	26064	156953	86	8	37	131
<i>C. impressinervis</i>	<i>C. rosmannii</i>	BOP204644	86582	26046	18268	26046	156942	86	8	37	131
<i>C. murauchii</i>	<i>C. amplexifolia</i>	BOP204616	86169	26061	18261	26061	156552	87	8	37	132
<i>C. murauchii</i>	<i>C. sp.</i>	BOP204625	86241	26067	18274	26067	156649	87	8	37	132
<i>C. murauchii</i>	<i>C. sp.</i>	BOP204629	86207	26065	18291	26065	156628	87	8	37	132
<i>C. murauchii</i>	<i>C. sp.</i>	BOP204630	86174	26071	18291	26071	156607	87	8	37	132
<i>C. murauchii</i>	<i>C. sp.</i>	BOP204633	86223	26072	18258	26072	156625	87	8	37	132
<i>C. perpetua</i>	<i>C. ptilosperma</i>	BOP204598	86545	26064	18256	26064	156929	86	8	37	131
<i>C. petelotii</i>	<i>C. nitidissima</i>	BOP028246	86633	26600	17735	26600	157568	87	8	37	132
<i>C. petelotii</i>	<i>C. microcarpa</i>	BOP028249	86633	26600	17735	26600	157568	87	8	37	132
<i>C. petelotii</i>	<i>C. nitidissima</i> var. <i>longistyla</i>	BOP204585	86297	26046	18255	26046	156644	86	8	37	131
<i>C. petelotii</i>	<i>C. euphlebia</i>	BOP204591	86275	26064	18257	26064	156660	86	8	37	131
<i>C. petelotii</i>	<i>C. chuongtsoensis</i>	BOP204596	86271	26046	18256	26046	156619	86	8	37	131
<i>C. petelotii</i>	<i>C. leptopetala</i>	BOP204634	86637	26091	18276	26091	157095	86	8	37	131
<i>C. petelotii</i>	<i>C. nitidissima</i>	BOP204636	86647	26072	18277	26072	157068	86	8	37	131

<i>C. pingguoensis</i>	<i>C. pingguoensis</i>	BOP204587	86583	26081	18263	26081	157008	87	8	37	132
<i>C. ptilosperma</i>	<i>C. innominata</i>	BOP204576	86550	26059	18241	26059	156909	86	8	37	131
<i>C. ptilosperma</i>	<i>C. flavida</i>	BOP204579	86605	26090	18292	26090	157077	87	8	37	132
<i>C. ptilosperma</i>	<i>C. ptilosperma</i>	BOP204580	86529	26058	18265	26058	156910	86	8	37	131
<i>C. ptilosperma</i>	<i>C. fusuiensis</i>	BOP204590	86591	26064	18267	26064	156986	86	8	37	131
<i>C. ptilosperma</i>	<i>C. ptilosperma</i>	BOP204597	86566	26064	18268	26064	156962	86	8	37	131
<i>C. pubipetala</i>	<i>C. pubipetala</i>	BOP204592	86559	26064	18265	26064	156952	86	8	37	131
<i>C. sp.</i>	<i>C. sp.</i>	BOP204632	86498	26065	18244	26064	156871	86	8	37	131
<i>C. terminalis</i>	<i>C. pingguoensis</i> var. <i>terminalis</i>	BOP204583	86618	26061	18158	26061	156898	86	8	37	131
<i>C. terminalis</i>	<i>C. pingguoensis</i> var. <i>terminalis</i>	BOP204615	86588	26059	18170	26068	156885	87	8	37	132
<i>C. terminalis</i>	<i>C. sp.</i>	BOP204639	86198	26069	18210	26069	156546	86	8	37	131
<i>C. tunghinensis</i>	<i>C. tunghinensis</i>	BOP028297	86289	26046	18240	26046	156621	86	8	37	131
<i>C. tunghinensis</i>	<i>C. tunghinensis</i>	BOP204582	86282	26046	18250	26046	156624	86	8	37	131
<i>C. wumingensis</i>	<i>C. wumingensis</i>	BOP204619	86599	26051	18191	26060	156901	87	8	37	132
Mean			86496	26073	18242	26074	156885	87	8	37	132
STDEV			203	100	98	100	237	0	0	0	0

Table S3. Accession numbers of ITS and chloroplast genome sequences of golden flower camellias (*Camellia*).

Sample	ITS	Chloroplast genome
BOP028239	C_AA082730.1	-
BOP028240	C_AA082731.1	-
BOP028241	C_AA082732.1	C_AA082665.1
BOP028242	C_AA082733.1	C_AA082666.1
BOP028243	C_AA082734.1	-
BOP028244	C_AA082735.1	C_AA082667.1
BOP028245	C_AA082736.1	C_AA082668.1
BOP028246	C_AA082737.1	C_AA082669.1
BOP028247	C_AA082738.1	-
BOP028248	C_AA082739.1	-
BOP028249	C_AA082740.1	C_AA082670.1
BOP028250	C_AA082741.1	-
BOP028251	C_AA082742.1	-
BOP028252	C_AA082743.1	-
BOP028253	C_AA082744.1	-
BOP028289	C_AA082745.1	-
BOP028290	C_AA082746.1	-
BOP028291	C_AA082747.1	-
BOP028292	C_AA082748.1	-
BOP028293	C_AA082749.1	-
BOP028294	C_AA082750.1	-
BOP028295	C_AA082751.1	-
BOP028296	C_AA082752.1	-
BOP028297	C_AA082753.1	C_AA082671.1
BOP028298	C_AA082754.1	C_AA082672.1
BOP028299	C_AA082755.1	C_AA082673.1

BOP028542	C_AA082756.1	-
BOP028543	C_AA082757.1	-
BOP028544	C_AA082758.1	C_AA082674.1
BOP028545	C_AA082759.1	-
BOP204576	C_AA082760.1	C_AA082675.1
BOP204577	C_AA082761.1	C_AA082676.1
BOP204578	C_AA082762.1	C_AA082677.1
BOP204579	C_AA082763.1	C_AA082678.1
BOP204580	C_AA082764.1	C_AA082679.1
BOP204581	C_AA082765.1	C_AA082680.1
BOP204582	C_AA082766.1	C_AA082681.1
BOP204583	C_AA082767.1	C_AA082682.1
BOP204584	C_AA082768.1	C_AA082683.1
BOP204585	C_AA082769.1	C_AA082684.1
BOP204586	C_AA082770.1	C_AA082685.1
BOP204587	C_AA082771.1	C_AA082686.1
BOP204588	C_AA082772.1	C_AA082687.1
BOP204589	C_AA082773.1	-
BOP204590	C_AA082774.1	C_AA082688.1
BOP204591	C_AA082775.1	C_AA082689.1
BOP204592	C_AA082776.1	C_AA082690.1
BOP204593	C_AA082777.1	C_AA082691.1
BOP204594	C_AA082778.1	C_AA082692.1
BOP204595	C_AA082779.1	C_AA082693.1
BOP204596	C_AA082780.1	C_AA082694.1
BOP204597	C_AA082781.1	C_AA082695.1
BOP204598	C_AA082782.1	C_AA082696.1
BOP204599	C_AA082783.1	C_AA082697.1
BOP204600	C_AA082784.1	-

BOP204601	C_AA082785.1	-
BOP204602	C_AA082786.1	-
BOP204604	C_AA082787.1	-
BOP204605	C_AA082788.1	-
BOP204606	C_AA082789.1	-
BOP204607	C_AA082790.1	-
BOP204608	C_AA082791.1	C_AA082699.1
BOP204609	C_AA082792.1	C_AA082700.1
BOP204610	C_AA082793.1	C_AA082701.1
BOP204611	C_AA082794.1	C_AA082702.1
BOP204612	C_AA082795.1	-
BOP204613	C_AA082796.1	C_AA082703.1
BOP204614	C_AA082797.1	C_AA082704.1
BOP204615	C_AA082798.1	C_AA082705.1
BOP204616	C_AA082799.1	C_AA082706.1
BOP204617	C_AA082800.1	C_AA082707.1
BOP204618	C_AA082801.1	-
BOP204619	C_AA082802.1	C_AA082708.1
BOP204620	C_AA082803.1	-
BOP204621	C_AA082804.1	C_AA082709.1
BOP204622	C_AA082805.1	C_AA082710.1
BOP204623	C_AA082806.1	C_AA082711.1
BOP204624	C_AA082807.1	C_AA082712.1
BOP204625	C_AA082808.1	C_AA082713.1
BOP204626	C_AA082809.1	C_AA082714.1
BOP204627	C_AA082810.1	C_AA082715.1
BOP204628	C_AA082811.1	C_AA082716.1
BOP204629	C_AA082812.1	C_AA082717.1
BOP204630	C_AA082813.1	C_AA082718.1

BOP204631	C_AA082814.1	C_AA082719.1
BOP204632	C_AA082815.1	C_AA082720.1
BOP204633	C_AA082816.1	C_AA082721.1
BOP204634	C_AA082817.1	C_AA082722.1
BOP204635	C_AA082818.1	C_AA082723.1
BOP204636	C_AA082819.1	C_AA082724.1
BOP204637	C_AA082820.1	C_AA082725.1
BOP204638	C_AA082821.1	C_AA082726.1
BOP204639	C_AA082822.1	C_AA082727.1
BOP204644	C_AA082823.1	C_AA082728.1
BOP204645	C_AA082824.1	C_AA082729.1
BOP204603	-	C_AA082698.1
