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Supplementary material

From the desert it came: evolution of the Australian paper daisy genus *Leucochrysum* (Asteraceae, Gnaphalieae)

Alexander N. Schmidt-Lebuhn[A,C] *and Kiarrah J. Smith*[B]

[A]CSIRO, Australian National Herbarium, GPO Box 1600, Canberra, ACT 2601, Australia.

[B]1238 Bells Line of Road, Kurrajong Heights, NSW 2758, Australia.

[C]Correspondending author. Email: alexander.s-l@csiro.au

Table. S1. Voucher specimens of the samples used in the study and GenBank accession numbers for the sequences

For each sample, the order is laboratory number, voucher (italic), GenBank accession number(s). All vouchers are deposited at CANB/CBG. Sequences of Loci A33 and C30 (Chapman *et al*. 2007) do not have GenBank accession numbers because they are shorter than 200 bp. Their sequences are, therefore, presented here. Note that all ETS and *psb*A–*trn*H sequences have previously been published in Weber and Schmidt-Lebuhn (2015) but are included for completeness

ETS: *Anemocarpa podolepidium* (F.Muell.) Paul G.Wilson, 465, *R.W. Purdie 7916*, KM508012; *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*, KM507994; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1003, *Schmidt-Lebuhn 1603*, KM507995, 1014, *Jeanes 1640*, KM507996; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*, KM507997, 1009, *Purdie 6613*, KM507998; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1016, *Schmidt-Lebuhn 1616*, KM507999; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*, KM508000, 1005, *Schmidt-Lebuhn 1179*, KM508001, 1015, *Weber 2850*, KM508002.

A01: *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*, KM507958, KM507959, 1018, *Purdie 7775*, KM507970; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1003, *Schmidt-Lebuhn 1603*, KM507953, 1014, *Jeanes 1640*, KM507967, KM507968; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*, KM507960, KM507962, 1009, *Purdie 6613*, KM507963, KM507964; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1010, *Purdie 6130*, KM507965, KM507966, 1017, *Schmidt-Lebuhn 1617*, KM507969; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*, KM507954, KM507955, 1005, *Schmidt-Lebuhn 1179*, KM507956, KM507957.

A02: *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*, KM507986, KM507987; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1014, *Jeanes 1640*, KM507992; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*, KM507988, 1009, *Purdie 6613*, KM507989, KM507990; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1010, *Purdie 6130*, KM507991, 1017, *Schmidt-Lebuhn 1617*, KM507993; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*, KM507983, 1005, *Schmidt-Lebuhn 1179*, KM507984, KM507985.

A33 (first amplicon): *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATATTTTTTTCTTTTTTATATAAAATCCTTTGTACTAAGTTCTGATTAGTATC
CTCTTTTAACATGAAACATATATTTCCTGTCTAAAAATAGGA, 1018, *Purdie 7775*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACTGAAAGACTGGTAATTGCTAAAGAAGAGTTTCATG
CCATTTTAGAGGTATTTAATATTTAATATTTTTTCTTTTTTATATAAAATCATTTGTGCTAAGTTCTGATT
AGTATCCTCTTTTAACATGAAACCTATCTTTTCTGTCTTAAATAGGA,
AAGCTATAATATATGTGGTTGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATATTTTTTCTTTTTCATATAAAATCATTTGTGCTGAGTTCTGATTAGTATCC
TCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1003, *Schmidt-Lebuhn 1603*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATATTTTTTTCTTTTTTATATAAAATCCTTTGTACTAAGTTCTGATTAGTATC
CTCTTTTAACATGAAACATATATTTCCTGTCTAAAAATAGGA,
AAGCTATAATATATGTGGTTGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTTTTTAATATTTTTTCTTTTTTTATATAAAATCATTTGTGCTAAGTTCTGATTAGTATC
CTCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA, 1014, *Jeanes 1640*,
AAGCTATAATATATGTGGTTGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTTTTTAATATTTTTTCTTTTTTATATAAAATCATTTGTGCTAAGTTCTGATTAGTGTCC
TCTTTTAACATAAAACGTATTTCTTATGTCTTAAAATAGGA,
AAGCTATAATATATGTGGTTGATTCTAGTGACACAGAAAGGCTGGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTATTATTTTTTCTTTTTTATATAAAACCATTTGTGCTATGTTCTGATTAGTATCC
TCTTTTAACTTGAAACATATCTTTTCTGTCTTAAAATAGGA; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATATTTTTTTTCTTTTTTATATAAAATCTTTTGTGCTACGTTCTGATTAGTAT
CCTCTTTTAACATGAAACATATGTTTTCTGTCTTAAAATAGGA, 1009, *Purdie 6613*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACTGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG

CAATTTTAGAGGTTTTTAATATTTTTTCTTTTTTATATAAAATCCTTTGTGCTAAGTTCTGATTAGTAATT
TAGTATCCTCTTTTAACATGAAACATATCTTTTCTGTCTATATAGGA; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1010, *Purdie 6130*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACTGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTTTTTAATATTTTTTCTTTTTTATATAAAATCCTTTGTGCTAAGTTCTGATTAGTAATT
TAGTATCCTCTTTTAACATGAAACATATCTTTTCTGTCTATATAGGA,
AAGCTATAATATATGTCGTCGATTCTAGTGACACTGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTTTTCTTTTTTTtATATAAAATCATTTGTGCTAAGTTCTGATTAGTATCCTCTTTT
TACATGAAATATATCTTCTCTGTCTTAATTAGGA, 1017, *Schmidt-Lebuhn 1617*,
AAGCTATAATATATGTGGTTGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATATTTATTATTTTTTATATAAAATCCTTTGTGCTAAGTTCTGATTAGTAATT
TAGTATCCTCTTTTAACATGAAACATATCTTTTCTGTCTATATAGGA,
AAGCTATAATATATGTCGTCGATTCTAGTGACACAGAAAGACTTGTAATTGCTAAAGAAGAGTTTCATG
CAATTTTAGAGGTATTTAATAtTTTTTTCTTTTTTATATAAAATCTTTTGTGCTACGTTCTGATTAGTATCC
TCTTTTAACCTGAAACAATAGGA; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTGGTAATTGCTAAAGAAGAGTTTCAT
GCCATTTTAGAGGTATATAATATCTTTTCTTTTTTtATATAAAATCATTTGTGCCAAGTTCTGATTAGTAT
CCTCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTGGTAATTGCTAAAGAAGAGTTTCAT
GCCATTTTAGAGGTATATAATATTTTTTCTTTTTTATATAAAATCATTTGTGCTAAGTTCTGATTAGTAAC
CTCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA, 1005, *Schmidt-Lebuhn 1179*,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTGGTAATTGCTAAAGAAGAGTTTCAT
GCCATTTTAGAGGTATATAATATTTTTTCTTTTTTATATAACATCATTTGTGCTAAGTTCTGATTAGTATC
CTCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA,
AAGCTATAATATATGTGGTCGATTCTAGTGACACAGAAAGACTGGTAATTGCTAAAGAAGAGTTTCAT
GCCATTTTAGAGGTATATAATATTTTTTCTTTTTTATATAAAATCATTTGTGCTAAGTTCTGATTAGTATC
CTCTTTTAACATAAAACATATTTCTTATGTCTTAAAATAGGA.

C30: *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*,
GCAGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAAGAATAAGAAAAAATACTACTTATAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAAGAATAAGAAAAAATACTACTTATAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA, 1018, *Purdie 7775*,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAATAATAAGAAAAAATACTACTTATAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCTGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAATAATAAGAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTA
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1003, *Schmidt-Lebuhn 1603*,
GCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAATAATAACAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA, 1014, *Jeanes 1640*,
GCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAATAATAACAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTCTATATAA
AGATTATATCCTAAATAATAACAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*,
TCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTCAATAATAAGAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTA
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTCAATAATAAGAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTA
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA, 1009, *Purdie 6613*,
GCTGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTCAATAATAAGAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTA

GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCAGTGTATATCATGTATCCTCCTGTCGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTCAATAATAAGAAAAATTACAACTTTAAGATTTAGGGGACATTAGATTATATACCTTA
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1010, *Purdie 6130*,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTTCAAAGTAACAGCACAGTTTATATAA
AGATTATATCCTAAATAATAAGAAAAAATACTACTTATAGATTTAGGGGACATTAGATTATATACCTTG
GGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTAACAAAGTAACAGCACAGTTTATATA
AATAATTATATCCTAAATAATACTAAGAAAAATTACAACTTGAAGATATAGGGGACATTAGATTATAT
ACCTTAGGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA, 1017, *Schmidt-Lebuhn 1617*,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTAACAAAGTAACAGCACAGTTTATATA
AATAATTATATCCTAAATAATACTAAGAAAAATTACAACTTGAAGATATAGGGGACATTAGATTATAT
ACCTTAGGTTTTCCGGTGCTTCCACTAGTATAAAGAAGAAA; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAAAACACCCTATCAAAGTAACAGCACAGTTTATATA
AATATTATATCCTATAAAATAAGGAAAACTACAACTTTAAGATTTAGGGGACATTAGATAATATACCTT
AGGTTTACCAGTGCTTCCACTAGTATAAAGAAGAAA,
GCGGTGTATATCATGTATCCTCCTGTAGTGTGCAGAACACCCTATCAAAGTAACAGCACAGTTTATATA
AATATATTATATCCTAGATAATAAGAAAAAAATACTACTTGTAGATTTAAGGGGCATTAGATTATATAC
CTTGGGTTTACCAGTGCTTCCACTAGTATAAAGAAGAAA.

***psb*A–*trn*H:** *Anemocarpa podolepidium* (F.Muell.) Paul G.Wilson, 465, *R.W. Purdie 7916*, KM508051; *Leucochrysum albicans* (A.Cunn.) Paul G.Wilson, 1006, *Schmidt-Lebuhn 1580*, KM508039, 1007, *Schmidt-Lebuhn 1607*, KM508040, 1018, *Purdie 7775*, KM508047; *Leucochrysum alpinum* (F.Muell.) R.J.Dennis & N.G.Walsh, 1003, *Schmidt-Lebuhn 1603*, KM508036, 1014, *Jeanes 1640*, KM508044; *Leucochrysum graminifolium* (Paul G.Wilson) Paul G.Wilson, 1008, *Mallinson 421*, KM508041, 1009, *Purdie 6613*, KM508042; *Leucochrysum molle* (A.Cunn. ex DC.) Paul G.Wilson, 1010, *Purdie 6130*, KM508043, 1016, *Schmidt-Lebuhn 1616*, KM508045, 1017, *Schmidt-Lebuhn 1617*, KM508046; *Leucochrysum stipitatum* (F.Muell.) Paul G.Wilson, 1004, *Schmidt-Lebuhn 1158*, KM508037, 1005, *Schmidt-Lebuhn 1179*, KM508038.

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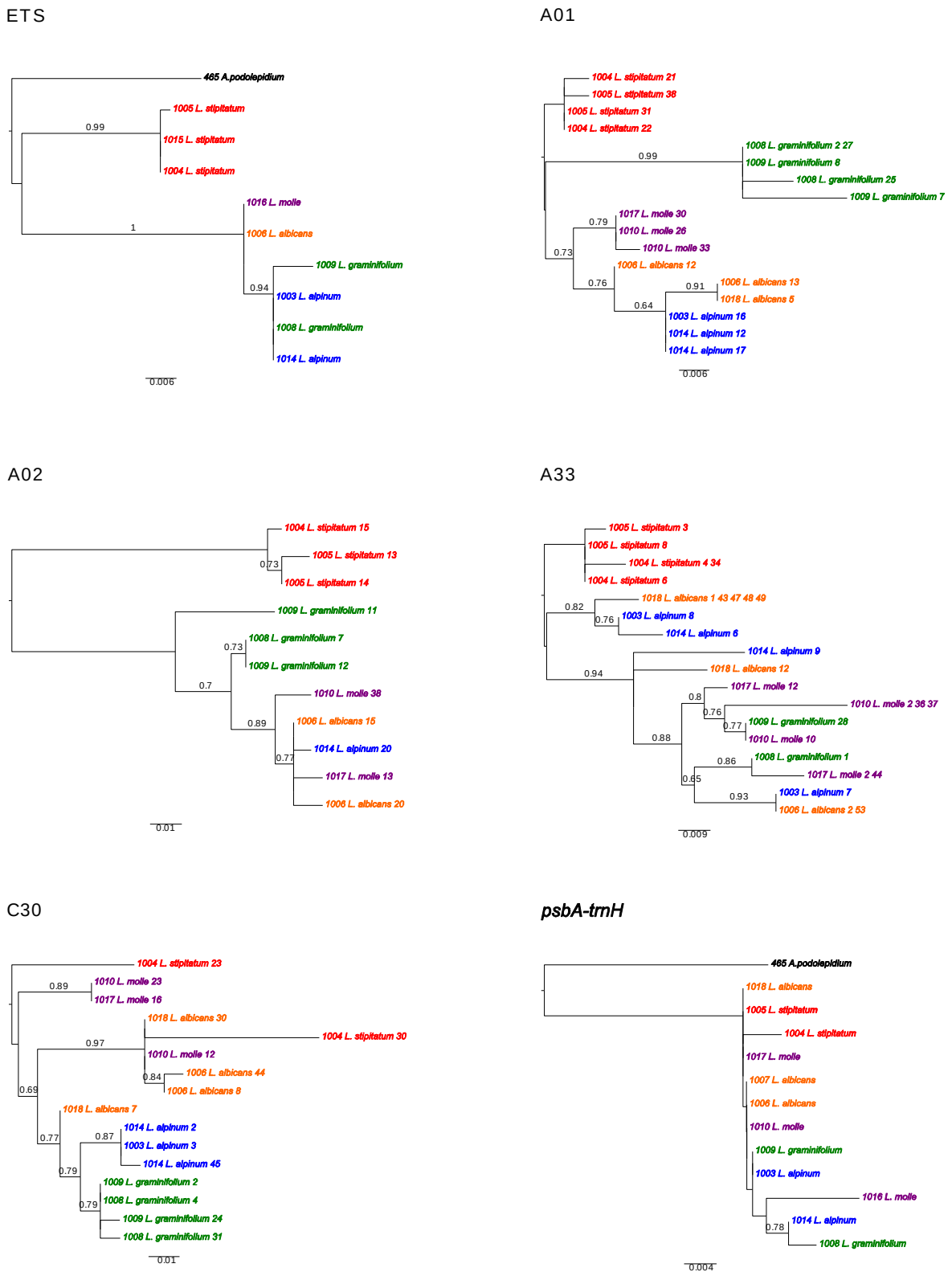

Fig. S1. PhyML likelihood gene trees of the six regions used for species-tree inference in *Leucochrysum* (Guindon *et al*. 2010). Numbers before species names are sample numbers as used in Table S1, whereas numbers after species names are consensus sequence numbers used to differentiate alleles from the same specimen. Numbers above branches indicate aLRT branch support. Trees were rooted on *Anemocarpa podolepidium* where available, otherwise on *L. stipitatum*.

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