

Supplementary Table 2.1. Estimated mean ages (with 95% highest posterior densities) for major angiosperm clades. The multiple-fossil analysis treated all fossil constraints as exponential or lognormal priors with offsets equal to first occurrence of a given fossil in the record (see text for more detail). Clade names are from APG III (2009), Cantino et al. (2007), Soltis et al. (1995), and Moore et al. (2010). Ages are from Bell et al. (2012) (crown ages) and Magallón et al. (2015), uncorrelated lognormal (UCLN) (stem clades are given for families, and the crown ages for the for higher categories).

Taxa	Lognormal	UCLN (median)
Angiospermae	183 (167-199)	-
Austrobaileyales	89 (88-91)	122.61
Schisandraceae	146 (109-127)	109.73
<i>Mesangiospermae</i>	140 (128-140)	135.91
<i>Magnoliidae</i>	119 (100-138)	132.39
<i>Eucotyledoneae</i>	129 (116-143)	131.68
<i>Gunneridae</i>	121 (111-124)	-
<i>Pentapetalae</i>	120 (112-131)	123.73
superasterids (including Dilleniaceae)	121 (113-129)	122.58
<i>Campanulidae</i>	100 (92-109)	102.69
superrosids	125 (118-132)	122.41
<i>Rosidae</i>	111 (107-117)	118.58
<i>Fabidae</i>	102 (95-109)	116.81
Nymphaeales	42 (27-56)	125.43
Chloranthales	98 (97-100)	122.56

Piperales	119 (100-138)	105.44
Saururaceae	54 (31-77)	65.52
Piperaceae	40 (28-56)	65.52
Aristolochiaceae	104 (82-126)	105.44
Laurales	119 (107-133)	114.9
Calycanthaceae	98 (97-100)	114.9
Lauraceae	13 (6-22)	105.09
Monimiaceae	41 (23-57)	91.2
Canellales	80 (50-111)	126
Canellaceae	10 (5-17)	126
Winteraceae	19 (11-27)	126
Magnoliales	76 (58-96)	109.59
Myristicaceae	11 (5-18)	85.3
Magnoliaceae	36 (20-54)	108.69
Annonaceae	25 (15-36)	94.22
<i>Monocotyledoneae</i>	146 (109-127)	133.23
<i>Narthecidae</i>	136 (123-147)	-
Alismatales	122 (106-138)	128.86
Araceae	89 (59-114)	128.86
Tofieldiaceae	64 (35-95)	126.55
<i>Petrosaviidae</i>	124 (113-133)	-
Pandanales	82 (65-101)	72.35
Cyclanthaceae	33 (17-50)	53.7
Liliales	114 (105-123)	97.4
Liliaceae	58 (43-73)	43.92
Melanthiaceae	67 (50-85)	84.19
Asparagales	103 (93-114)	108.96
Orchidaceae	48 (31-69)	108.96

Tecophilaceae	52 (33-71)	79.69
Iridaceae	34 (20-49)	80.66
Amaryllidaceae	32 (17-48)	62.49
Convallariaceae	21 (15-29)	-
Hyacinthaceae	32 (20-43)	-
Dioscoreales	92 (76-111)	95.23
<i>Commelinidae</i>	103 (94-113)	-
Dasypogonaceae	42 (21-64)	108.24
Arecaceae, Arecales	33 (21-36)	98.21 (49.36)
Poales	93 (84-103)	100.98
Bromeliaceae	21 (12-32)	75.89
Cyperaceae	37 (25-49)	55.16
Poaceae	31 (20-42)	58.58
Commelinales	76 (61-91)	68.55
Philydraceae	32 (17-49)	62.33
Zingiberales	84 (84-89)	58.26
Musaceae	36 (20-51)	54.88
Strelitziaceae	25 (15-36)	58.26
Marantaceae	18 (9-28)	38.24
Costaceae	21 (13-28)	-
Zingiberaceae	19 (13-25)	47.69
Ranunculales	108 (94-122)	114.83
Papaveraceae	88 (70-106)	112.94
Circaeasteraceae	48 (33-65)	86.33
Lardizabalaceae	38 (25-51)	86.33
Menispermaceae	35 (20-52)	89.93
Berberidaceae	36 (21-54)	80.28
Ranunculaceae	59 (44-73)	80.28

Proteales	116 (103-131)	117.38
Proteaceae	36 (17-57)	106.22
Sabiaceae	89 (57-126)	127.5
Buxaceae	99 (97-103)	85.1
Trochodendraceae	20 (15-65)	129
Dilleniaceae	58 (31-83)	122.58
Caryophyllales	106 (96-115)	107.05
Polygonaceae	42 (28-58)	67.9
Plumbaginaceae	43 (31-57)	67.9
Caryophyllales s. s. or core Caryophyllales	93 (82-102)	-
Amaranthaceae	39 (22-54)	64.16
Nyctaginaceae	23 (15-32)	63.5
Santalales	99 (81-115)	103.58
Viscaceae	44 (30-59)	-
Santalaceae	50 (32-68)	81.47
Vitaceae	48 (21-79)	121.29
Saxifragales	103 (96-111)	112.99
Hamamelidaceae	27 (15-42)	95.93
Altingiaceae	7 (2-14)	94.44
Saxifragaceae	38 (26-50)	85.69
Crassulaceae	50 (37-63)	95.37
Haloragaceae	24 (14-34)	72.09
COM clade	104 (97-111)	-
Celastrales	76 (62-89)	92.61
Parnassiaceae	34 (19-48)	68.54
Celastraceae	57 (44-71)	92.61
Nitrogen-fixing clade	99 (91-107)	-

Fabales	83 (73-94)	98.7
Polygalaceae	46 (31-60)	96.07
Fabaceae	63 (49-77)	92.14
Cucurbitales	67 (56-78)	64.6
Cucurbitaceae	23 (12-34)	57.08
Fagales	55 (43-68)	102.82
Fagaceae	31 (17-45)	97.88
Betulaceae	20 (11-28)	84.77
Juglandaceae	4 (1-8)	68.6
Rosales	85 (88-104)	98.96
Rosaceae	44 (30-59)	98.96
Rhamnaceae	62 (48-73)	69.7
Elaeagnaceae	20 (11-30)	65.22
Urticaceae	35 (24-46)	68.51
Moraceae	35 (21-47)	68.51
Cannabaceae	37 (27-47)	73.47
Crossosomatales	92 (73-110)	84.63
Geraniales	93 (79-106)	102.39
Melianthaceae	35 (21-52)	33.01
Geraniaceae	54 (40-71)	102.39
Oxalidales	94 (82-105)	106.36
Oxalidaceae	37 (21-52)	57.39
Cunoniaceae	29 (19-42)	80.59
Elaeocarpaceae	42 (30-55)	81.63
Malpighiales	92 (88-97)	103.51
Chrysobalanaceae	17 (7-26)	54.52
Picrodendraceae	43 (27-60)	83.78
Malpighiaceae	60 (53-67)	73.88

Rhizophoraceae	63 (47-79)	72.86
Linaceae	73 (63-82)	86.86
Achariaceae	81 (76-89)	94.36
Passifloraceae	43 (32-55)	89.2
Salicaceae	63 (55-71)	74.11
Myrtales	89 (89-99)	96.64
Onagraceae	25 (14-40)	72.64
Lythraceae	50 (34-65)	72.64
Combretaceae	24 (11-37)	89.89
Brassicales	82 (69-94)	81.6
Akaniaceae	6 (2-12)	-
Limnanthaceae	13 (6-22)	73.31
Brassicaceae	33 (23-43)	44.22
Sapindales	71 (70-75)	87.51
Sapindaceae	42 (30-53)	79.15
Meliaceae	38 (28-48)	69.28
Rutaceae	40 (29-51)	66.84
Malvales	83 (70-89)	76.35
Thymelaeaceae	36 (23-49)	59.76
Malvaceae	39 (22-44)	59.76
<i>Asteridae</i>	114 (107-122)	114.57
Cornales	87 (86-92)	104.6
Cornaceae	67 (47-82)	92.6
Nyssaceae	24 (10-42)	92.6
Hydrangeaceae (includes <i>Hydrostachys</i> in this analysis)	43 (30-58)	90.52
Loasaceae	33 (22-44)	90.52
Ericales	92 (92-102)	103.58

Primulaceae	61 (48-74)	86.95
Lecythidaceae	48 (30-65)	99.71
Polemoniaceae	36 (24-47)	82.99
Styracaceae	38 (22-52)	52.7
Ternstroemiaceae (Pentaphyllacaceae)	54 (37-69)	95.62
Ericaceae	15 (8-23)	69.29
<i>Lamiidae</i>	104 (95-113)	-
Garryales	77 (56-96)	69.35
Solanales	76 (64-85)	79.24
Solanaceae	38 (26-49)	66.65
Convolvulaceae	25 (12-37)	66.65
Boraginaceae	57 (41-73)	88.25
Gentianales	69 (54-78)	67.73
Apocynaceae	23 (11-33)	52.07
Rubiaceae	57 (45-69)	67.73
Lamiales	74 (68-78)	77.05
Oleaceae	45 (26-62)	71.02
Plantaginaceae	46 (36-57)	48.63
Scrophulariaceae	53 (45-58)	48.63
Bignoniaceae	25 (17-32)	47.03
Verbenaceae	30 (20-40)	39.82
Lamiaceae	40 (28-50)	40.29
Lentibulariaceae	42 (31-54)	43.42
Acanthaceae	41 (31-50)	43.42
Gesneriaceae	56 (46-66)	48.63
Aquifoliales	87 (85-101)	91.97
Escalloniaceae	72 (55-87)	92.73
Dipsacales	60 (48-74)	70.94

Adoxaceae	33 (16-54)	70.94
Caprifoliaceae	37 (35-40)	70.11
Apiales	53 (42-63)	80.81
Pittosporaceae	12 (7-20)	63.37
Araliaceae	19 (9-28)	60.19
Apiaceae	32 (22-42)	58
Asterales	84 (76-94)	83.2
Campanulaceae	56 (41-67)	76.05
Stylidiaceae	71 (63-80)	76.48
Menyanthaceae	47 (31-60)	68.27
Asteraceae	43 (35-52)	49.34