Table 5.2. Age estimates for crown group of selected New World angiosperm lineages based on molecular data (incorporating available fossil records). From P. Stevens (2001 et seq. and references cited therein (e.g., Bell et al., 2010; Iles et al., 2014; Magallón et al., 2015; Manos et al., 2007; Tank et al., 2015; Wang et al., 2010; Wikström et al., 2001; Xi et al., 2012; Xiang et al., 2014; Zhou et al, 2014.). Names of genera in parentheses refer to fossils reported from Latin America and following the family assignments in II, appendix 2.2.

Lineage	Age (Ma)
Aquifoliaceae *(Ilex*)	52; 65; crown group *Ilex*- 15
Arecaceae	110; 78-(72)-63; and other wide-ranging estimates (21-90) "Fossil Arecaceae date to ca. 93 m.y. (Pan et al., 2006; Harley, 2006)" (P. Stevens, 2001 et seq.).
Betulaceae	131-115; 64; 63-43; 72.5-(64.4)-59.4; 88.6-(85.9)-83
Alnus/Betula divergence	25-19; 28-20, 18-10; wide range in other divergence estimates
Coryloideae	87.5; 39-22; 56.4-(54)- 50.6
Erythroxylaceae (*Erythroxylon*)	42.5-(19.3)-12.3
Juglandaceae	85.8; 96.4-(79.9)-71.2
Engelhardioideae	36.2; 44; 49.4-(37.7)-28
(*Alfaroa-Engelhardia-Oreomunnia*)	
Juglandoideae (*Carya/Juglans)*	65 ; 52-67; 69.7-(66.6)-62.6; *Carya* and *Juglans* divergence estimated at 8-4 and 7-6. Author note: The two genera have distinctive pollen and each is

reported from Oligo-Miocene (20-25 Ma) sediments in Latin America (II, p. 593).

Lythraceae (see Case Studies, Chapter 7)

Malpighiaceae 39-36; 32-29; 75-64; 68; 69-(59.8)-52.5

"The earliest fossils attributable to Malpighiaceae are from the Northern Hemisphere in the later Eocene Claiborne Formation in Tennessee, USA; the deposits are ca. 34 m.y.a. (Taylor and Crepet, 1987)" (P. Stevens, 2001 et seq.)

(*Banisteria/Banisteriopsis, Bunchosia,Byrsonima, Hiraea, Malpighia, Mascagnia*)

Malvaceae 47-44; 31-27; 78-(66)-64; 44-(39)-22; 78.6-(70.7)-63.4

"Fossils placed in the family are considerably older. Wood attributable to Malvaceae is known from the late Maastrichtian (Cretaceous) ca. 68 m.y.a.; it has simple perforation plates in radial multiples and storied wood but tile cells were not reported (Wheeler et al., 1994). Malvaceous wood (*Bombacoxylon*) has also been found in Campanian sediments in Texas 75 m.y. old (Wheeler and Lehman, 2009)" (P. Stevens, 2001 et seq.).

Sterculioideae (*Sterculia*) 46-(28)-13.8

Tilioideae (*Tilia*) 33.2-(17.1)-2.2

Malvoideae (*Hampea/Hibiscus*)	58-47; 45-43; 62.9-(61.2)-60.1
	"Leaves named as *Malvaciphyllum macondicus*, found in sediments 60-58 m.y. old from Cérrejon, Columbia, have been placed in Malvoideae (Carvalho et al., 2011). No mention is made of hairs of this fossil, but pollen of *Bombacacidites* was common in the rocks" (P. Stevens, 2001 et seq.).
Bombacoideae (*Pachira*, *Pseudobombax*)	47-(26)-12.2
Myricaceae (*Myrica)*	81.7-(69.7)-60.4
Nymphaeales	125; 133-(126.7)- 120.6; 176.6-(97.7)-42.8; 164; 188
Cabombaceae	
Brasenia/Cabomba divergence	31-21; 20-10; 109-(101)-93; 75-67; 60-52
Nymphaeaceae (*Nelumbo*, *Nymphaea)*	121; 100.1; 99.6-(95.5)-92.9; 49-32; 29-15; 60.6-(28.2)-3.8; 51.8; 40.8
Rhizophoraceae (see also Case Studies, Chapter 7)	54.5-(41.7)-30.4
Rhizophoraeae (*Rhizophora*)	50
Symphonieae (*Symphonia*)	57-54; 45-42; 73-61; 45-31; 88.7-(82.2)-73.6; ca. 91.3
Rubiaceae (see Case Studies, Chapter 7)	

Salicaceae 50-47; 40-37; 71-63; 61-55; 87-(79.2)-72.8

Samydoideae (*Casearia*) 38.8-(37.4)-36.3

Salicoideae (*Salix*) 36-33; 26-23; 55-51; 50-47; 65.1-(58)-51.3; 58-(52)-48

Sapindaceae (*Allophyllus, Cardiospermum, Cupania, Dodonea, Matayba, Meliococcus, Paullinia, Sapindus, Serjania, Talisia, Thouinia, Urvillea*)

117.4; 104.9; 90.5

Sapotaceae (*Bumelia, Chrysophyllum, Mimusops, Sideroxylon*)

105-(84)-67.1; 107

Chrysophylloideae 105-(91.7)-79

Styracaceae (*Styrax*; dates for crown group of Order Ericales)

109-103; 97-92; 85-80; 103-99; 117 +/- 9.2; 114; 126-(113)-85; 98.85; 102-92; 125-(118)-110; 103.6; 117-(109)-100

Theaceae (*Cleyera*; Ericales, see Styracaceae)

Ulmaceae (*Celtis, Ulmus*)

"*Ulmus* is known as leaves and fruits from Early Eocene deposits of northwestern China some 50 m.y. (Wang et al., 2010; see also Friis et al., 2011 for Cainozoic fossils); this suggests an appreciably greater age for crown-group Ulmaceae as a whole" (P. Stevens, 2001 et seq.).

Vochysiaceae (*Vochysia*) 36-33; 52-(39)-28

Zygophyllaceae (crown group for order Zygophyllaces)

88-(79)-70; 64-(55)-46; 102; 74-70; 64-60; 88-70; 65-45;

93.4-(61.9)-29.3; 83.5