

JESPER KÅREHED. 2001. Multiple origins of the tropical forest tree family Icacinaceae.

American Journal of Botany 88(12): 2259-2274.

Alignment gaps inserted in the *ndhF* matrix. Character number refers to the potentially phylogenetically informative gaps used in the analyses. The location of gaps corresponds to the sequence of *Nicotiana tabacum* (Shinozaki et al., 1986; Olmstead et al., 1993). As in Olmstead et al. (2000), the range of deleted nucleotides is indicated with “-” and the relative location of an insertion is indicated with “/”. Insertions of different length are regarded as separate events and completely overlapping gaps are coded as “inapplicable” (see the simple indel coding of Simmons and Ochoterena, 2000). For *Styloidium*, the sequence in the region of gap 1-5 is missing.

Gap	Character	Location	Size	Polarity	Taxa
	no. ^a				
1	1	1396-1404	9	Deletion	<i>Hedera, Panax</i>
2	2	1415-1420	6	Deletion	<i>Anagallis, Ardisia</i>
3		1437/1438	3	Insertion	<i>Gelsemium</i>
4	3	1443/1444	6	Insertion	<i>Marcgravia, Scaevola</i>
5	4	1446/1447	9	Deletion ^b	<i>Impatiens, Nicotiana</i>
6		1450-1452	3	Deletion	<i>Impatiens</i>
7	5	1455/1456	6 (3)	Insertion	<i>Portulaca (Clavija, Sambucus)</i>
8		1466-74	9	Deletion	<i>Ottoschulzia</i>
9	6 ¹	1470/71	9	Insertion	<i>Abelia, Acer, Actinidia, Alangium, Alseuosmia, Alsodeiopsis, Apodytes, Arbutus, Barnadesia, Berzelia, Bombax,</i>

Boopis, Bougainvillea, Callitriche,
Camellia, Campanula, Cassinopsis
ilicifolia, C. sp., Ceanothus,
Cercidiphyllum, Citronella gongonha, C.
moorei, Clavija, Clethra, Codonopsis,
Cornus, Corokia, Delarbrea, Diospyros,
Dipsacus, Discophora, Escallonia,
Eucnide, Eurya, Fendlera, Garrya,
Grisollea, Gustavia, Halesia, Hedera,
Heuchera, Hydrangea, Icacina, Ilex,
Impatiens, Iodes, Irvingbaileya,
Lasianthera, Leptaulus citroides, L.
daphnoides, Lobelia, Mappia,
Marcgravia, Melanophylla, Menyanthes,
Mirabilis, Mollugo, Muntingia,
Napoleonaea, Natsiatum, Nothapodytes,
Nymphoides, Nyssa, Paeonia, Panax,
Pennantia corymbosa, P. cunninghamii,
Phelline, Philadelphus, Phlox,
Phytocrene, Pittosporum, Plumbago,
Portulaca, Pyrenacantha grandifolia, P.
malvifolia, Quercus, Raphiostylis,
Rhamnus, Sambucus, Scabiosa,
Scaevola, Sollya, Stachyanthus,
Sterculia, Stylidium, Styrax,

Symphoricarpos, Valeriana, Viburnum

10		1471-1509	39	Deletion	<i>Callitriche</i>
11		1471-1479	9	Deletion	<i>Borago</i>
12		1471-1476	6	Deletion	<i>Anagallis</i>
13		1471-1473	3	Deletion	<i>Raphiostylis</i>
14		1474-1476	3	Deletion	<i>Ardisia</i>
15		1477-1482	6	Deletion	<i>Lamium</i>
16		1479-1482	4	Deletion	<i>Sterculia</i>
17		1479-1503	25	Deletion	<i>Natsiatum</i>
18	7 ^{2,3,4}	1479/1480	3 (1)	Insertion	<i>Alseuosmia, Barnadesia, Bombax, Boopis, Borago, Campanula, Codonopsis, Corokia, Jasminum, Lobelia, Menyanthes, Nymphoides, Phelline, Pyrenacantha malvifolia, Roussea, Sambucus, Scaevola, Stylidium, Zea (Pyrenacantha grandifolia)</i>
19	8	1480-1527	48	Deletion	<i>Convolvulus, Ipomoea</i>
20	9 ^{2,4,5}	1480-1488	9	Deletion	<i>Lobelia, Mappia, Nothapodytes, Veronica</i>
21		1480-1481	2	Deletion	<i>Stachyanthus</i>
22		1483-1485	3	Deletion	<i>Jasminum</i>
23		1485	1	Deletion	<i>Stachyanthus</i>
24	10 ^{2,4,5,6}	1485/1486	6 (4)	Insertion	<i>Acer, Icacina, Phlox, Pyrenacantha grandifolia, Pyrenacantha malvifolia,</i>

					<i>(Gustavia)</i>
25	11 ^{2, 4, 5, 6, 7, 8}	1486-1488	3	Deletion	<i>Alseuosmia, Alsodeiopsis, Aucuba, Barnadesia, Boopis, Borago, Campanula, Codonopsis, Corokia, Digitalis, Eucnide, Fendlera, Gelsemium, Helwingia, Ilex, Iodes, Lamium, Menyanthes, Nymphoides, Phelline, Philadelphus, Phyllonoma, Phytocrene, Roussea, Sambucus, Scaevola, Stylidium</i>
26		1486-1509	24	Deletion	<i>Bombax</i>
27		1486-1494	9	Deletion	<i>Zea</i>
28		1496-1509	14	Deletion	<i>Sterculia</i>
29		1497/1498	6 (2)	Insertion	<i>Pyrenacantha malvifolia (Gustavia)</i>
30		1498-1513	16	Deletion	<i>Plumbago</i>
31	12 ^{2, 4, 5, 7, 9, 10}	1498-1503	6	Deletion	<i>Barleria, Justicia</i>
32		1498-1500	3	Deletion	<i>Impatiens</i>
33		1507-1509	3	Deletion	<i>Impatiens</i>
34	13 ⁵	1507-1515	9	Deletion	<i>Sambucus, Viburnum</i>
35	14 ^{5, 10, 11}	1509/1510	6 (3)	Insertion	<i>Bougainvillea, Mirabilis, Mollugo, Portulaca, Sterculia (Quercus)</i>
36	15 ⁵	1515/1516	6 (2)	Insertion	<i>Mappia, Nothapodytes, Phlox (Natsiatum)</i>
37	16 ⁵	1516-1524	9	Deletion	<i>Boopis, Iodes</i>

38		1519-1527	9	Deletion	<i>Paeonia</i>
39		1525-1527	3	Deletion	<i>Arbutus</i>
40		1525-1529	5	Deletion	<i>Plumbago</i>
41	17 ¹²	1527/1528	9 (6)	Insertion	<i>Rhamnus (Muntingia, Portulaca)</i>
42		1530-1538	9	Deletion	<i>Natsiatum</i>
43	18 ¹³	1536	1	Deletion	<i>Convolvulus, Ipomoea</i>
44		1536/1537	6	Insertion	<i>Sambucus</i>
45		1544-1547	4	Deletion	<i>Natsiatum</i>
46	19 ¹⁴	1545/1546	6	Insertion	<i>Barleria, Buddleja, Callitriche, Campsis, Digitalis, Euthystachys, Justicia, Lamium, Lantana, Myoporum, Phyla, Proboscidea, Veronica</i>
47		1552-1559	8	Deletion	<i>Natsiatum</i>
48	20	1560-1566	7	Deletion	<i>Convolvulus, Ipomoea</i>
49		1564-1569	6	Deletion	<i>Natsiatum</i>
50	21	1567-1572	6	Deletion	<i>Acer, Bombax, Cercidiphyllum, Heuchera, Magnolia, Liriodendron, Sterculia, Zea</i>
51		1568-1570	3	Deletion	<i>Cardiopteris</i>
52	22	1571-1592	22	Deletion	<i>Convolvulus, Ipomoea</i>
53		1572	1	Deletion	<i>Natsiatum</i>
54	23 ¹⁵	1572/1573	6	Insertion	<i>Leptaulus citroides, L. daphnoides</i>
55		1573-1578	6	Deletion	<i>Corokia</i>
56	24 ¹⁵	1581/1582	15 (6)	Insertion	<i>Nothapodytes (Alsodeiopsis, Heuchera, Icacina, Mappia, Natsiatum,</i>

					<i>Phytocrene, Pyrenacantha grandifolia, Stachyanthus)</i>
57	25,	1686/1687	12 (9)	Insertion	<i>Ceanothus (Berzelia, Quercus)</i>
	26		[6]		<i>[Dipsacus, Scabiosa]</i>
58	27	1687-1692	6	Deletion	<i>Convolvulus, Ipomoea</i>
59	28	1693-1698	6	Deletion	<i>Campanula, Codonopsis, Lobelia</i>
60	29	1698/1699	6 (3)	Insertion	<i>Phyllonoma, (Leptaulus citroides, L. daphnoides)</i>
61	30	1699-1707	9	Deletion	<i>Jasminum, Olea</i>
62	31	1705-1710	6	Deletion	<i>Bougainvillea, Mirabilis</i>
63	32 ¹⁶	1707/1708	9 (3)	Insertion	<i>Zea, Convolvulus, Ipomoea</i>
64	33	1708-1713	6	Deletion	<i>Barleria, Borago, Hydrophyllum, Justicia</i>
65		1713/1714	6	Insertion	<i>Zea</i>
66	34	1768-1773	6	Deletion	<i>Convolvulus, Ipomoea, Mappia</i>
67		1770/1771	6	Insertion	<i>Plumbago</i>
68		1905/1906	6	Insertion	<i>Delarbrea</i>
69		1906-1911	6	Deletion	<i>Napoleonaea</i>
70		1906-1914	9	Deletion	<i>Cassinopsis sp.</i>
71	35	1914/1915	6 (3)	Insertion	<i>Camellia, Gustavia, Justicia, Natsiatum, Napoleonaea (Actinidia)</i>
72	36	1923/1924	6	Insertion	<i>Acer, Ceanothus, Quercus, Rhamnus</i>

^aCoding of overlapping gaps: (1) inapplicable for *Ottoschulzia* due to overlap with deletion 8; (2) inapplicable for *Callitriche* due to overlap with deletion 10; (3) inapplicable for *Lamium* and *Sterculia* due to overlap with deletions 15 and 16, respectively; (4) inapplicable for *Natsiatum* due to overlap with deletion 17; (5) inapplicable for *Convolvulus* and *Ipomoea*

due to overlap with deletion 19; (6) inapplicable for *Lobelia*, *Mappia*, *Nothapodytes*, *Veronica* due to overlap with deletion 20; (7) inapplicable for *Bombax* due to overlap with deletion 22; (8) inapplicable for *Zea* due to overlap with deletion 23; (9) inapplicable for *Sterculia* due to overlap with deletion 28; (10) inapplicable for *Plumbago* due to overlap with deletion 30; (11) inapplicable for *Sambucus* and *Viburnum* due to overlap with deletion 34; (12) inapplicable for *Plumbago* due to overlap with deletion 40; (13) inapplicable for *Natsiatum* due to overlap with deletion 42; (14) inapplicable for *Natsiatum* due to overlap with deletion 45; (15) inapplicable for *Convolvulus* and *Ipomoea* due to overlap with deletion 52; and (16) inapplicable for *Bougainvillea* and *Mirabilis* due to overlap with deletion 62.

^bRather an insertion of 9 bp in all taxa except *Impatiens* and *Nicotiana*.