Data Collection on Intergeneric Hybrids and Basic Types:

ANGIOSPERMAE
families A–C

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https://www.wort-und-wissen.org/artikel/data-collection-basic-types/

ANGIOSPERMAE

65 orders, 642 families, 17.000 genera, ca. 300.000 species + extinct taxa

Arranged alphabetically according to families.
Only a selection of families is listed in this paper!

families A–C

for Asteraceae see separate file

Delimitation of families and genera after AP website 2025/2026 (= **Angiosperm Phylogeny Group)** as summarized by P. Stevens (2001 onwards) http://www.mobot.org/MOBOT/Research/APweb/welcome.html accessed 2024/2025, Subdivision of families after AP website 2025/2026 or en.wikipedia 2025/2026.

Summary:

443 intergeneric hybrids (incl. IT + ISF)
26 preliminary basic types.
(1 subtribe, 8 tribes, 6 subfamilies, 11 families).
Average species-number pro basic type: 14649 / 26 = 563-

Acoraceae (*Acorus*) 1: 2–4. –
Aizoaceae subfamily Mesembryanthemoideae (*Mesembryanthemum*) 1: 100. –
Aizoaceae Ruschioideae tribes Ruschieae + Delospermeae 98: 1550. **28 IG + 8 IT**
Altingiaceae (*Liquidambar*) 1: 13. –
Amaryllidaceae Allioideae tribe Allieae (*Allium*) 1: 1020. –
Amaryllidaceae Amaryllidoideae tribe Amaryllideae 11: 146. **4 IG + 6 IST**
Amborellaceae (*Amborella*) 1: 1. –
Apocynaceae Asclepiadoideae Ceropegieae subtribe Stapeliinae 22–37: 330. **36 IG** (or 2 IG)
Aquifoliaceae (*Ilex*) 1: 600. –
Arecaceae Arecoideae tribe Cocoseae 10: 248. **5 IG**
Asparagaceae Agavoideae tribe Agaveae genus *Agave* s. l. 1: 270. –
Asphodelaceae Asphodeloideae tribe Aloeae 13: 750. **23 IG**
Balsaminaceae 2: 1050. –
Begoniaceae 2: 2000. –
Brassicaceae tribe Brassiceae 53: 243. **40 IG**
Bromeliaceae 78: 3650. **70 IG + 8 IT + 8 ISF**
Butomaceae (*Butomus*) 1: 1. –
Cactaceae subfamily Cactoideae 112: 1500. **120 IG + 30 IT**
Cactaceae subfamilies Leuenbergerioideae + Pereskioideae 2: 17. **2 ISF**

Caprifoliaceae subfamily Diervilloideae 2: 16. **1 IG**
Caricaceae 6: 28. **1 IG**
Cercidiphyllaceae (*Cercidophyllum*) 1: 2. **–**
Crassulaceae subfamily Crassuloideae (*Crassula*) 1: 200. **–**
Crassulaceae subfamily Sempervivoideae 30: 1005. **5 IG + 1 IT**
Ceratophyllaceae (*Ceratophyllum*) 1: 6. **–**
Cyperaceae Cyperoideae tribe Cariceae (*Carex*) 1: 2300. **–**

Abbreviations:

° = taxa actually not accepted in the rank of a genus, e.g. *Cerasus*° (= *Prunus* p. p.)

10: 50 etc. The numbers behind the names of families etc. refer to extant genera and species
IS = interspecific hybrid. **IG** = intergeneric hybrid. **IST** = intersubtribal hybrid.
IT = intertribal hybrid. **ISF** = intersubfamilial hybrid. **IF** = interfamilial hybrid.
EC = embryo culture or ovule culture
SO = somatic hybrid by cell fusion; normally these hybrids are asymmetric
AS = asymmetric hybrids, they do not equally express maternal and paternal features
HY = assumed intergeneric hybridogeneous origin of a taxon.
nat. hyb. = natural hybrid **art. hyb.** = artificial hybrid

Colors within the crosses:

Red letters: intergeneric hybrids (incl. former IG).
Violet = plurigeneric hybrids
Gray letters: hybridity unconfirmed or erroneous.
Green letters: notes on tribes, subfamilies etc. involved in the hybridization.

Yellow shaded: Notes concerning basic types.

General references on Angiospermae

Angiosperm Phylogeny group (Chase MW et al.) (2016) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. Bot. J. Linnean Soc. 181, 1–20. https://doi.org/10.1111/boj.12385 → Stevens

Belea A (1992) Interspecific and intergeneric crosses in cultivated plants. Budapest: Akademiai Kiado.

Brummitt RK (1992) Kews Vascular Plant Families and Genera. Royal Botanical Gardens Kew. excellent book, but meanwhile not up to date

Feng Z-H et al. (2024). Nomenclatural novelties for intergeneric nothotaxa. Phytoneuron 2024-85: 1–. https://www.phytoneuron.net/wp-content/uploads/2024/12/85PhytoN-IntergenericNothotaxa.pdf
93 new names!

Focke WO (1881) Die Pflanzenmischlinge. Berlin: Borntraeger.
Folk RA et al. (2018) New prospects in the detection and comparative analysis of hybridization in the tree of life. American Journal of Botany 105, 364–375
Haartman JJ (1751) Plantae hybridae. Dissertation Uppsala. Lidén no. 33. (also cited as „Linné C von & Haartman JJ (1751) Plantae hybridae. Upsaliae." and part of Linné C von (1756) Amoenitates academicae 3 (p. 28 ff.) http://ia600602.us.archive.org/25/items/mobot31753000806395/mobot31753000806395.pdf only of historical interest, not hybrids as defined today!
Index Kewensis **IK** preceding IPNI
International Plant Names Index (= **IPNI**) = www.ipni.org
Knobloch IW (1972) Intergeneric hybridization in flowering plants. Taxon 21, 97–103.The author writes: „No claims are made that the list is complete or absolutely accurate. ... it is pointed out that hybrids, throughout the range, show both dominance and intermediacy ..."
Mallet, J (2007) Hybrid speciation. Nature, 446, 279–283. https://doi.org/10.1038/nature05706
Mitchell N et al. (2019) Correlates of hybridization in plants. Evolution Letters 3, 570–585. https://doi.org/10.1002/evl3.146 mainly interspecific hybrids, cf. Whitney et al. (2010)
Oehler E (1956) Art- und Gattungskreuzung. Handbuch der Pflanzenzüchtung I, 563–611.
POWO Plants of the world online (= **POWO**). https://powo.science.kew.org/ This data base lists more hybrids than IPNI, but only hybrids to which a scientific name has been attributed!
Stace CA (1975) Hybridization and the flora of the British Isles. Academic Press.
Stace CA (1995) New flora of the British Isles. Cambridge: University Press.
Stevens PF (2001 onwards). Angiosperm phylogeny website. https://www.mobot.org/MOBOT/research/APweb/ (= **AP website**).
Tsitsin NV (ed.) (1960) Wide hybridization in plants. Akad. Nauk. SSSR. Translated from Russian. 1962 National Science Foundation, Washington. https://keen101.wordpress.com/wp-content/uploads/2017/12/wide_hybridization_in_plants_tsitsin2.pdf not all data are confirmed
WFO Plant List https://www.worldfloraonline.org/
Whitney KD et al. (2010) Patterns of hybridization in plants. Perspect. Plant Ecol. Evol. Syst. 12, 175–182. mainly interspecific hybrids
Willis JC (1985) Dictionary of flowering plants and ferns, ed. 8 = Student edition. Cambridge University Press.
Zander R (2008) Handwörterbuch der Pflanzennamen. Dictionary of plant names. Dictionnaire de plantes. 18. ed. Stuttgart: Ulmer.

Acanthaceae (Lamiales) 229: 5100

acanthus family = Akanthusgewächse

4 subfamilies (AP website 2024):

Acanthoideae 217: 4733, Avicennioideae 1: 8, Nelsonioideae 6: 175, Thunbergioideae 5: 260.

Acanthoideae 217: 4733. **2 IG + 1 IT**

8 tribes: Acantheae 21: 550 (*Aphelandra 170*, ...), Andrographideae 4: 122, Barlerieae 13: 520, Justicieae 96: 2473 (*Justicia 900* incl. × *Sericobonia*°, ...), Neuracantheae 1: 30, × Physacantheae 1: 3, Ruellieae 37: 1200, Whitfieldieae 8: 33.

Interestingly, one of the newly described tribes (**× Physacantheae**) is based on a (reconstructed) intertribal hybrid. It connects tribes Acantheae and Ruellieae. But please note that putative cases of (ancient) hybridization do not necessarily demonstrate that hybridization actually occurred.

Aphelandra aurantiaca (*„nitens“*) × *Aphelandra maculata* (*“lindenii”*) (*„Stenandrium lindenii”*) **IS** Acantheae (→ *Aphelandra* × *dubia* L. Linden & Rodigas 1894 in Ill. Hort. 233 t. 15) IK (art. hyb.), Knobloch 1972

Jacobinia° (= *Justicia*) *ghiesbreghtiana* × *Libonia*° *floribunda* (= *Justicia rizzinii*) **IS** Justicieae (→ *Justicia* × *penrhosiensis*) Willis 1985, Zander 2008

Libonia° (= *Justicia* p. p.) × *Sericographis*° (= *Justicia* p. p.) **IS** Justicieae (→ × *Sericobonia*° 1875) POWO 2025 (*Justicia* IS)

× *Physacanthus* **IT** × Physacantheae = Acantheae × Ruellieae **HY** Tripp et al. 2011a, b (the authors discuss an ancient intertribal hybridization for this genus, which formerly was placed in Ruellieae, AP website 2024 (accepted)

Ruspolia (*“Pseuderanthemum”, “Justicia”*) *hypocrateriformis* × *Ruttya ovata* Justicieae (→ × *Ruttyruspolia* A. Meeuse & de Wet 1961 in Bothalia 7, 440) IK 1970, Knobloch 1972, Lowrey & Crawford 1987, POWO 2025

References:

Long RW (1975) Artificial interspecific hybridization in temperate and tropical species of *Ruellia* (Acanthaceae). Brittonia 27, 289–296. https://www.jstor.org/stable/2805899

Lowrey TK & Crawford DJ (1987) Electrophoretic confirmation of the intergeneric hybrid × *Ruttyruspolia* (Acanthaceae). Plant Syst. Evol. 158, 29–36.

Tripp EA et al. (2011a) *Physacanthus* (Acanthaceae): a heteroplasmic, intergeneric, interlineage hybrid? Botany Conference. Bot. Soc. of America, July 2011. http://2011.botanyconference.org/engine/search/index.php?func=detail&aid=183,

Tripp EA et al. (2011b) Origin of African *Physacanthus* (Acanthaceae) via wide hybridization. PLoS ONE 8 (1) e55677. http://www.plosone.org/article/info:doi/10.1371/journal.pone.0055677

Acoraceae (Acorales) 1: 2–4

calamus, sweet flags = Kalmusgewächse

Sole family of the order Acorales. Formerly placed in Araceae.

Acorus.

Probably **basic type family Acoraceae** (*Acorus*) (1: 2–4), mainly due to its isolated taxonomic

position. The order Acorales has only 1 genus, and from a molecular view is thought to be sister clade to all other monocotyledons.

Agavaceae → Asparagaceae

Aizoaceae (Caryophyllales) 124: 1722

fig marigold family = Mittagsblumengewächse

5 subfamilies (AP website 2026):
Acrosanthoideae 1: 7 (since 2017).
Aizooideae 5: 116.
Mesembryanthemoideae 1: 105.
Ruschioideae 106: 800–1600.
Sesuvioideae 4: 65.

For taxonomic studies, see Chesselet et al. 2002, 2004, Hartmann 1998, 2001, Klak et al. 2003, 2004, Landrum 2001, Schwantes 1971, Thiede et al. 2007, Hartmann 2017
See also the websites http://www.mesembs.de/ and http://members.tripod.com/~mesembry/html/mesembs.
For synonyms of the former genus *Mesembryanthemum* s. l. see Brown 1929 and http://www.ars–grin.gov/cgi–bin/npgs/html/splist.pl?7489, e.g. *Carpobrotus, Glottiphyllum* and *Lampranthus* etc. (now Ruschieae), *Dorotheanthus* (now Dorotheantheae), *Mesembryanthemum* (Mesembryanthemoideae).

Acrosanthoideae 1: 7

Acrosanthes (formerly Aizooideae).

Aizooideae 5: 116

Aizoanthemopsis 1 hispanica, Aizoanthemum, Aizoon (incl. *Galenia°, Plinthus°*), *Gunniopsis, Tetragonia* (formerly part of subfamily Tetragonioideae).

Mesembryanthemoideae 1: 105

Monophyletic: *Mesembryanthemum* (incl. *Aptenia°, Aridaria°, Aspazoma°,,Brownanthus°, Caulipsolon°, Dactyopsis°, Phyllobolus°, Platythyra°, Prenia°, Psilocaulon°, Sceletium°, Synaptophyllum°*).

Probably **basic type Aizoaceae subfamily Mesembryanthemoideae** (1: 100). The actual reduction of the subfamily to one genus points in the direction of a basic type.

IS: POWO 2026 *Mesembryanthemum* 2 IS.

Aptenia° (= *Mesembryanthemum*) *cordifolia*) × *Platythyra° (Mesembryanthemum, Aptenia°) haeckeliana* **IS** Davis Arboretum Univ. California 1998

Ruschioideae 130: 1600
4 tribes:
Apatesieae 7: 11 *Apatesia, Carpanthea, Caryotophora, Conicosia, Hymenogyne, Saphesia, Skiatophytum.*
Dorotheantheae (annual taxa) 1: 13 *Cleretum* (incl. *Aethephyllum*°, *Dorotheanthus*°).
Delospermeae 27: 524 (= largest part of Ruschieae s. l. of Hartmann 2003)
Ruschieae s. str. 71: 1013.

Ruschieae s. l. (Delospermeae + Ruschieae s. str.) 98: 1550. **28 IG/IST + 7 IT**
living stones = Lebende Steine
Hartmann 1998 distinguishes 10 groups (see below), but no distinction is made later.
Recent taxonomy: Hartmann 2016. AP website 2024 separates the Delospermeae as a distinct tribe, but most authors do not differentiate within Ruschieae.
Subdivision according to Hartmann 1998:
AP website 2024 follows the separation of Delospermeae 27: 524 (Bergeranthus-Gr., Delosperma-Gr., and Stomatium-Gr.) from Ruschieae s. str. 71: 1013, as proposed by Chesselet 2002.

Bergeranthus Group: *Bergeranthus, Bijlia, Carruanthus, Cerochlamys, Hereroa, Machairophyllum, Rhombophyllum.*
Delosperma Group: *Corpuscularia, Delosperma 170, Drosanthemum, Gibbaeum, Imitaria*°*, Malephora, Mestoklema, Muiria, Oscularia, Trichodiadema*.
Dracophilus Group: *Conophytum* (incl. *Herreanthus*), *Dracophilus, Hartmanthus, Jensenobotrya, Juttadinteria, Namibia, Nelia, Psammophora, Ruschianthus.*
Eberlanzia Group: *Amphibolia, Eberlanzia, Ruschianthemum, Stoeberia.*
Lampranthus Group: *Antegibbaeaunsia, Carpobrotus, Circandra, Enarganthe, Erepsia, Esterhuysenia, Lampranthus, Namaquanthus, Scopelogena, Smicrostigma, Vlokia, Wooleya, Zeuktophyllum.*
Leipoldtia Group: *Antimima, Argyroderma, Cephalophyllum, Cheiridopsis, Cylindrophyllum, Fenestraria, Hallianthus, Jordaaniella, Leipoldtia* s. l., *Octopoma* s. str., *Odontophorus, Ottosonderia, Pleiospilos, Schlechteranthus, Vanzijlia.*
Mitrophyllum Group: *Dicrocaulon, Diplosoma, Disphyma, Drosanthemopsis, Glottiphyllum, Jacobsenia, Meyerophytum, Mitrophyllum, Monilaria, Oophytum.*
Ruschia Group: *Acrodon, Arenifera, Astridia, Ebracteola, Khadia, Marlothistella, Polymita, Ruschia, Stayneria.*
Stomatium Group: *Chasmatophyllum, Faucaria, Frithia,* Hammeria, *Mossia, Neohenricia, Orthopterum, Rabiea, Rhinephyllum, Stomatium.*
Titanopsis Group: *Aloinopsis, Deilanthe, Didymaotus, Lithops, Nananthus, Prepodesma.*

The high number of known hybrids in Ruschieae is due to the popularity of this subfamily in horticulture. According to Ihlenfeldt 1994 and Klak et al. 2004 the radiation of this group is extraordinarily high in respect to the number of species and the very short time.

Basic type Aizoaceae Ruschioideae tribes Ruschieae incl. Delospermeae (98: 1550, **28 IG, 8 IT**) (Kutzelnigg 2009, 2025): 9 of the 10 groups (subtribes) of Hartman 2003 are connected by hybridization. They are the result of an extensive recent radiation and are very closely related (Klak et al. 2003, 2004, 2014) with the high number of nearly 100 genera! The remaining *Eberlanzia*-Gr. does not differ substantially from the rest. Moreover, molecular data show that Ruschioideae as a whole are monophyletic, **so probably the basic type rather covers the whole subfamily**. – According to AP website 2024 tribe Delospermeae (Chesselet et al. 2002) is accepted as separate from Ruschieae s. l. with 3 of the 10 groups of Hartman 2003 (including all taxa with a lophomorphic meronectary). Tribe Delospermeae is linked with tribe Ruschieae anyway.

Acrodon × *Cerochlamys* **IT** Ruschia-Gr. × Bergeranthus-Gr. (→ × *Cerodon* S. A. Hammer 2013) POWO 2025

Aloinopsis × *Deilanthe* (= *Aloinopsis*) Titanopsis-Gr. (→ × *Aloilanthe* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996, POWO 2025

Aloinopsis × *Nananthus* Titanopsis-Gr. (→ × *Nananopsis* S. A. Hammer 1996 in Cact. Succ. J. (U.S.A.) 67, 172) IK 1996, Hammer & Liede 1990 (art. hyb.)

Aloinopsis × *Nananthus* × *Titanopsis* Titanopsis-Gr. (→ × *Nanalotanopsis* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996

Aloinopsis × *Prepodesma* (= *Aloinopsis* p. p.) Titanopsis-Gr. (→ × *Prepopsis* S. A. Hammer 2003 Mesemb Study Group Bull. 18, 78) IPNI 2007, POWO 2025

Aloinopsis × *Titanopsis* Titanopsis-Gr. (→ × *Alotanopsis* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) (art. hyb.) IK 1996, POWO 2025

Argyroderma × *Lapidaria* **IST** Leipoldtia-Gr. × Titanopsis-Gr. (→ × *Lapiderma* S. A. Hammer 1999 (publ. 2000) cf. Repert. Pl. Succ. (I.O.S.) 50, 7) IPNI 2007

Argyroderma × *Lithops* **IST** Leipoldtia-Gr. × Titanopsis-Gr. (→ × *Argyrops* Kimnach 1980 Cact. Succ. J. USA 52, 196) (art. hyb.) Eggli & Taylor 1994, POWO 2025

Carpobrotus × *Disphyma* **IST** Lampranthus-Gr. × Mitrophyllum-Gr. (→ × *Carpophyma* G. D. Rowley 1980 Name that Succulent, 199) (nat. hyb.) (The first hybrids were published by Chinnock RJ 1973 in New Zealand J. Bot. 10, 615–625) IK 1987, Eggli 1994, Heenan & Sykes 2010 (*C. chilensis* × *D. australe, C. edulis* × *D. australe*; nat. hyb. New Zealand.), POWO 2025

Carruanthus × *Machairophyllum* Bergeranthus-Gr. (→ × *Carruanthophyllum* 1980 G. D. Rowley, Name that Succulent, 200) IK 1987 (AP website 2024 Delospermeae)

Cheiridopsis × *Ihlenfeldtia*° (= *Cheiridopsis*) **IS** Leipoldtia-Gr. (→ × *Ihlenopsis* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996

Cheiridopsis × *Odontophorus*° *(Cheiridopsis)* **IS** Leipoldtia-Gr. (→ × *Cheirontophorus* S. A. Hammer 1995 in Cact. Succ. J. (U.S.A.) 67, 172) IK 1996

Conophytum × *Glottiphyllum* **IST** Dracophilus-Gr. × Mitrophyllum-Gr. Hammer & Liede 1990 (art. hyb.)

Conophytum × *Herreanthus*° (= *Conophytum*) **IS** Dracophilus-Gr. Hammer & Liede 1990 (art. hyb.)

Conophytum × *Lithops* **IST** Dracophilus-Gr. × Titanopsis-Gr. (→ × *Conopops* S. A. Hammer 1995 in Cact. Succ. J. (U.S.A.) 67, 172) IK 1996

Conophytum × *Ophthalmophyllum*° (= *Conophytum*) **IS** Dracophilus-Gr. (art. hyb.) Hammer &

Liede 1990 (*Ophthalmophyllum* is now regarded as section of *Conophytum*.)

Delosperma pruinosum (= *echinatum*) × *Glottiphyllum linguiforme* **IT** Delosperma-Gr. × Mitrophyllum-Gr. (→ × *Delosphyllum* 1980 G. D. Rowley, Name that Succulent, 203 = *Mesembryanthemum* × *schickii* hort.) (art. hyb.) (Brown 1929, Knobloch 1972, IK 1987

Delosperma × *Lampranthus* **IT** Delosperma-Gr. × Lampranthus-Gr. Braun & Winkelmann 2016

Didymaotus × *Gibbaeum* **IT** Titanopsis-Gr. × Delosperma-Gr. (→ × *Gibbaotus* S. A. Hammer 2004 Mesemb Study Group Bull. 19, 74) IPNI 2007

Didymaotus × *Titanopsis* Titanopsis-Gr.- (→ × *Titymaotus* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173) IK 1996, POWO 2025

Dinteranthus × *Lithops* Titanopsis-Gr. (→ × *Dinterops* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) (art. hyb.) IK 1996

Diplosoma × *Monilaria* Mitrophyllum-Gr. (→ × *Monilaroma* S. A. Hammer 2008 in Mesemb Study Group Bull. 23 (4): 80) IPNI 2011

Disphyma × *Glottiphyllum* Mitrophyllum-Gr. (→ × *Diphyllum* Kapitany 2013), POWO 2025

Dracophilus × *Juttadinteria* Dracophilus-Gr. (→ × *Dracadinteria* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996

Enarganthe × *Wooleya* Lampranthus-Gr. (→ × *Woolarganthe* S. A. Hammer 2000 Mesemb Study Group Bull. 15, 66) IPNI 2007, POWO 2025

Faucaria × *Glottiphyllum* **IT** Stomatium-Gr. × Mitrophyllum-Gr. Hammer & Liede 1990

Faucaria × *Rhombophyllum* **IT** Stomatium-Gr. × Bergeranthus-Gr. (→ × *Rhombocaria* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173; nat. hyb.) IK 1996, POWO 2025

Faucaria × *Stomatium* Stomatium-Gr. (→ × *Faumatium* S. A. Hammer 2000 Mesemb Study Group Bull. 15, 66), IPNI 2007

Gibbaeum × *Glottiphyllum* **IT** Delosperma-Gr. × Mitrophyllum-Gr. (→ × *Gibaeophyllum* 1980 G. D. Rowley, Name that Succulent, 206) (art. hyb.) IK 1987

Gibbaeum × *Muiria (Gibbaeum) hortenseae* **IS** Delosperma-Gr. (→ × *Muirio–Gibbaeum* 1933 Jacobsen, Sukkulent., 164; 1935 Jacobsen, Succ. Pl., 221; nat. hyb.) IK 1938, de Vos 1951, Knobloch 1972

Hartmanthus (= *Jensenobotrya* p. p.) × *Jensenobotrya lossowiana* Dracophilus-Gr. (→ × *Harbotrya* S. A. Hammer 1995 in Cact. Succ. J. (U.S.A.) 67, 172) IK 1996; *Hartmanthus* is accepted by the Mesemb Study Group 2008

Jacobsenia × *Mitrophyllum* Mitrophyllum-Gr. (→ × *Jacophyllum* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996

Lapidaria × *Lithops* Titanopsis-Gr. (→ × *Lapthops* S. A. Hammer 1995 in Cact. Succ. J. (U.S.A.) 67, 172; (nat. hyb., both crossing directions successful) IK 1996

Meyerophytum × *Mitrophyllum* Mitrophyllum-Gr. (→ × *Metrophyllum* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996, POWO 2025

Mossia × *Neohenricia* Stomatium-Gr. (→ × *Mohenricia* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 172) IK 1996

Neohenricia × *Stomatium* Stomatium-Gr. (→ × *Stomatricia* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173) IK 1996, POWO 2025

Neohenricia × *Titanopsis* **IT** Stomatium-Gr. × Titanopsis-Gr. (→ × *Neonopsis* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173) IK 1996

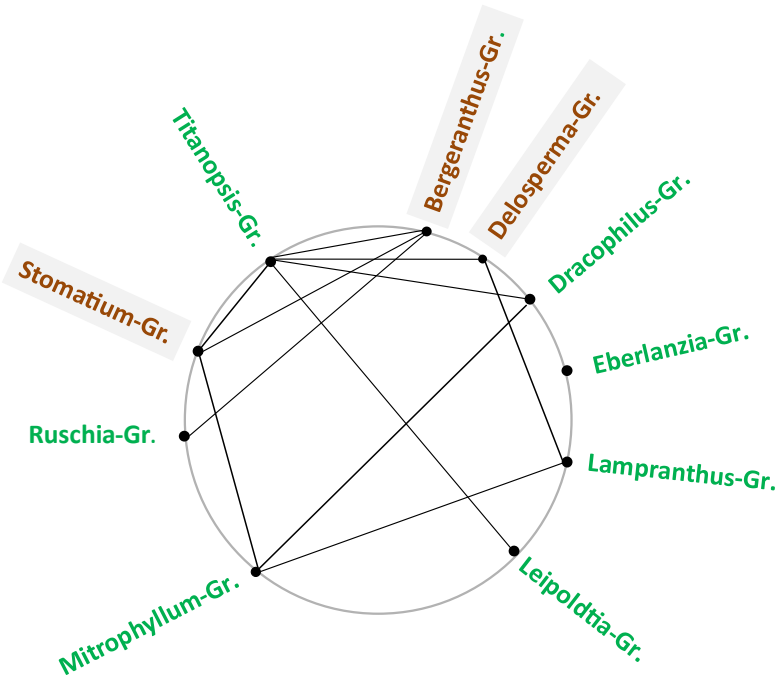
Ophthalmophyllum° (= *Conophytum* p. p.) × *Tanquana* **IST** Dracophilus-Gr. × Titanopsis-Gr.

Hammer & Liede 1990 (hybrids are viable only under special conditions)

Pleiospilos × *Prepodesma* **IST** Leipoldtia-Gr. × Titanopsis-Gr. (→ × *Pleiodesma* S. A. Hammer 2004), POWO 2025

Pleiospilos × *Tanquana* **IST** Leipoldtia-Gr. (→ × *Tanquilos* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173) (art. hyb.) IK 1996 (according to Hammer & Liede 1990 this type of hybrids has invaded the cultivated gene pool in collections of succulents), POWO 2025

Titanopsis × *Vanheerdea* Titanopsis-Gr. (→ × *Vananopsis* S. A. Hammer 1995 in Cact. Succ. J. (U. S. A.) 67, 173) IK 1996, POWO 2025



Aizoaceae Ruschioideae tribes Ruschieae + Delospermeae: hybrid connections between the subtribes (**Gr** = „groups" according to Hartmann 1998) from Kutzelnigg 2009, updated 2026. Green letters = tribe Ruschieae s. str., brown letters tribe Delospermeae.

Sesuvioideae 5: 65

C4-plants

Cypselea, Sesuvia, Trianthema, Tribulocarpus (formerly part of Tetragonioideae), *Zaleya*.

References:

Braun P & Winkelmann T (2016) Localization and overcoming of hybridization barriers in *Delosperma* and *Lampranthus* (Aizoaceae). Euphytica 211, 255–275.

Brown J (1929) New and old species of *Mesembryanthemum*. J. Linnean Soc. Bot. 42, 56.

Chesselet P, Smith GF & Van Wyk AE (2002) A new tribal classification of Mesembryanthemaceae: evidence from floral nectaries. Taxon 51, 295–308.

Chesselet P, Van Wyk AE & Smith GF (2004) Notes on African plants. Mesembryanthemaceae. A new tribe and adjustments to infrafamilial classification.

Bothalia 34, 47–51.
de Vos M (1951) Notes on the chromosome morphology of the genus *Gibbaeum* Haw. J. South Afr. Bot. 11, 77–81.
Eggli U (1994) Sukkulenten. Stuttgart: Ulmer.
Eggli U & Taylor N (1994) List of names of succulent plants other than cacti published 1950–1992 from Repertorium Plantarum Succulentarum. Kent: Whitstable Litho.
Hammer SA (1997) Some newly found natural hybrids. Mesemb Study Group Bulletin 12, 41.
Hammer SA & Liede S (1990) Natural and artificial hybrids in the Mesembryanthemaceae. South African J. Bot. 56, 356–362.
Hartmann HEK (1998) Groupings in Ruschioideae (Aizoaceae). Mesemb Study Group Bull. 13, 35–36.
Hartmann HEK (ed.) (2001) Illustrated handbook of succulent plants. Aizoaceae A–E; Aizoaceae F–Z. Berlin etc.: Springer.
Hartmann HEK (Hrsg.) (2017) Illustrated Handbook of Succulent Plants: Aizoaceae. 2. Aufl. Springer Verlag, Berlin/Heidelberg 2017.
Heenan PB & Sykes WR (2010) Taxonomic notes on the New Zealand flora: × *Carpophyma mutabilis* and × *Carpophyma pallida* (Aizoaceae), new names for two wild intergeneric hybrids. New Zealand J. Bot. 48 (3–4), 225–230.
Herre H (1971) The genera of the Mesembryanthemaceae. Cape Town: Tafelberg.
Ihlenfeldt H–D (1994) Diversification in an arid world: The Mesembryanthemaceae. Annu. Rev. Ecol. Syst. 25, 521–546.
Klak C et al. (2013) A phylogenetic hypothesis for the recently diversified Ruschieae (Aizoaceae) in southern Africa. Mol. Phyl. Evol. 69, 1005–1020. https://doi.org/10.1016/j.ympev.2013.05.030
Klak C et al. (2003) A phylogenetic hypothesis for the Aizoaceae (Caryophyllales) based on four plastid DNA regions. Amer. J. Bot. 90, 1433–1445.
Klak C et al. (2004) Unmatched tempo of evolution in Southern African semi–desert ice plants. Nature 427, 63–65.
Kutzelnigg H (2009) Die „Lebenden Steine“ und ihre Verwandten (Aizoaceae: Ruschieae). Ein neuer Grundtyp und ein weiteres Beispiel für besonders schnelle Evolution. Stud. Integrale J. 16, 100–104. http://www.si-journal.de/index2.php?artikel=jg16/heft2/sij162-5.html for the English translation see the following entry
Kutzelnigg H (2025) “Living stones” and their kin (Aizoaceae: Ruschieae) – A new basic type and further example of exceptionally rapid evolution. In Sanders RW (ed.) Basic types of life. Tulsa, Oklahoma: Blyth Institute Press, pp. 177–184. English translation of Kutzelnigg 2009
Rowley GD (1982) Intergeneric hybrids in succulents. National Cactus and Succulent J. 37, 76–80.
Schwantes G (1971) The classification of the Mesembryanthemaceae. In Herre H (ed.) The genera of the Mesembryanthemaceae. Cape Town, South Africa: Tafelberg.
Thiede J et al. (2007) Phylogenetic implication of the chloroplast *rpo*C1 intron loss in the Aizoaceae (Caryophyllales). Biochem. Syst. Ecol. 35, 372–380.

Alismataceae (Alismatales) 15: 100 + fossil genera

water plantains = Froschlöffelgewächse

3 tribes (AP website 2025)

IS: IPNI 2013: *Alisma 3 IS.*

Alisma plantago-aquatica × *Baldellia* (= *„Echinodorus“*) *ranunculoides* Alismateae (nat. hyb.) **unconfirmed,** especially questioned by Björkvist 1968, see Les & Philbrick 1993 (→ × *Alismodorus* 1929 Wehrhahn, Gartenstauden 1, 9, in obs., nothospecies × *A. muretii* = *Echinodorus* × *praegeri* Glück 1936 in A. Pascher Süßwasserflora 15: 100) IK 1947, Knobloch 1972, POWO 2025 (no entry). – The genera *Alisma* and *Baldellia* are closely related.

References:

Björkqvist I (1968) Studies in *Alisma* L., 2. Chromosome studies, crossing experiments, and taxonomy. Op. Bot. Soc. Lund 19, 1–138.

Glück H (1913) Gattungs-Bastarde innerhalb der Familie Alismaceen. Beih. Bot. Zbl. 30, 124–137.

Les DH & Philbrick CT (1993) Studies of hybridization and chromosome number variation in aquatic angiosperms: evolutionary implications. Aquatic Botany 44, 181–228.

Aloaceae → Asphodelaceae

Alstroemeriaceae (Liliales) 4: 200

Peruvian lilies = Inkaliliengewächse

2 tribes (AP website 2024):

Alstroemerieae 2: 185 *Alstroemeria 80* (incl. *Schickendantzia°, Taltalia°*), *Bomarea 105* (incl. *Leontochir° ovallei*).

Luzuriageae 2: 6 *Drymophila 2, Luzuriaga 3.*

IS: IPNI 2024: *Alstroemeria 6 IS, Bomarea 1 IS.*

Alstroemeria × *Bomarea* (= *Leontochir°*) *ovallei* Alstroemerieae ovule culture = **EC** Bridgen 2011 (no details!), Kashihara et al. 2012 (“primary embryos aborted”)

References:

Bridgen M (2011) Flowering geophytes of Chile have ornamental potential. http://wwwlib.teiep.gr/images/stories/acta/Acta%20570/570_6.pdf

Kashihara Y et al. Y (2012) Towards intergeneric hybridization between *Alstroemeria* L. and *Bomarea* Mirb. Floriculture and Ornamental Biotechnology. http://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/52570/1/FOB_6%28SI2%29146-149o.pdf

Altingiaceae (Saxifragales) 1: 13 + extinct taxa

sweet gum, star gum, styrax = Amberbäume
Separated from Hamamelidaceae as family Altingiaceae by Ickert-Bond et al. 2005.
Liquidambar 13 (incl. *Altingia°, Cathayambar°, Semiliquidambar°, Sedgwickia°*).

Probably **basic type family Altingiaceae** (1: 13). Isolated monogeneric family (*Liquidambar*). The species are closely related. Some authors accept only 2 species *orientalis* and *styraciflua*. These are connected by hybridization.

IS: *Liquidambar* (*formosana* × *styraciflua*) Lewis et al. 2024 doi:10.1007/s11056-024-10057-7, (*formosana* × *orientalis; formosana* × *styraciflua; orientalis* × *styraciflua*) Santamour 1972 https://academic.oup.com/forestscience/article/18/1/23/4675355, and see below.

Altingia° (Liquidambar) × *Liquidambar* **IS HY** (→ *Semiliquidambar°* nat. hybridogeneous taxon) Wu et al. 2009, Ickert-Bond & Wen 2013

References:

Ickert-Bond SM, Pigg KB & Wen J (2005) Comparative infructescence morphology in *Liquidambar* (Altingiaceae) and its evolutionary significance. Amer. J. Bot. 92, 1234–1255. http://www.amjbot.org/cgi/content/full/92/8/1234

Ickert-Bond SM & Wen J (2013) A taxonomic synopsis of Altingiaceae with nine new combinations. PhotoKeys 31, 21–61.

Wu W et al. (2009) Molecular evidence for natural intergeneric hybridization between *Liquidambar* and *Altingia*. J. Plant Res. 123, 231–239. doi: 10.1007/s10265-009-0275-z

Amaranthaceae (incl. Chenopodiaceae) (Caryophyllales) 180: 2000–2500

amaranth family = Fuchsschwanzgewächse
13 subfamilies:
Achyranthoideae, Aervoideae, Amaranthoideae, Betoideae, Camphorosmoideae, Celosioideae, Chenopodioideae 10: 500, Corispermoideae, Gomphrenoideae, Polycnemoideae, Salicornioideae, Salsoloideae, Suaeoideae 2: 83.

Amaranthoideae 57: 330.
polyphyletic

IS: IPNI 2013: *Amaranthus 17 IS.*

Amaranthus tricolor × *Celosia cristata* **ISF** Amaranthoideae × Celosioideae Mastuti et al. 1997 (**SO =** somatic hybrid, but some symmetric hybrids by protoplast fusion of calli)

Chenopodioideae 20: 500. **1 IG**
Some authors still retain this group as a separate family Chenopodiaceae.
4 tribes (AP website 2025):
Corispermeae 3, Chenopodieae (= Atripliceae) 10: 460, Axyrideae 3, Dysphanieae 4.

IS: IPNI 2018 (sub Chenopodiaceae): 49 IS (*Aellenia°* = *Halothamnus 1, Atriplex 6, Blitum 2, Chenopodium 40, Corispermum 3, Dysphania 2, Oxybasis 1, Salicornia 2, Suaeda 1*)

Chenopodiastrum (= *Chenopodium*) *hybridum* × *Lipandra polysperma* (= *Chenopodium polyspermum*) Chenopodieae (→ × *Lipastrum* Mosyakin 2013 in Phytoneuron 56, 1–8) Mosyakin 2013 (nat. hyb.) IPNI 218, POWO 2025

References:

Mastuti R et al. (1997) Production of intergeneric hybrid calli from C-3 and C-4 species of Amaranthaceae through protoplast fusion. Japanese J. Crop Science 66, 456–465. http://retnomastutibiologi.lecture.ub.ac.id/2012/04/production-of-intergeneric-hybrid-calli-from-c-3-and-c-4-species-of-amaranthaceae-through-protoplast-fusion/

Mosyakin SL (2013) New nomenclatural combinations in *Blitum*, *Oxybasis*, *Chenopodiastrum*, and *Lipandra* (Chenopodiaceae). Phytoneuron 56, 1–8. http://www.phytoneuron.net/2013Phytoneuron/56PhytoN-ChenopodiumNames.pdf

Amaryllidaceae (Asparagales) 73: 1605

amaryllis family = Amaryllisgewächse, Narzissengewächse

3 subfamilies (AP website 2024):
Agapanthoideae 1: 8.
Allioideae 14: 795 (4 tribes).
Amaryllidoideae 75: 900 (14 tribes).

Allioideae 14: 795

4 tribes.

Allieae 1: 1020

Allium 1020.

Probably **basic type Amaryllidaceae Allioideae tribe Allieae** (1: 1020) as a well-characterized family with only one monophyletic genus (*Allium*).

IS: POWO 2025: 1 IS only! – en.wikipedia 2026: "Many *Allium* species and hybrids are cultivated as ornamentals."

Amaryllidoideae 75: 900.

amaryllis, daffodils, snowdrops = Amaryllis-Verwandte

14 tribes (AP 2026):
Amaryllideae 11: 146.
Calostemmateae 2: 7.
Clinantheae 3: 40.
Cyrtantheae 1: 56 *Cyrtanthus* (incl. *Vallota°*).
Eucharideae (incl. Stenomesseae) 10: 100.

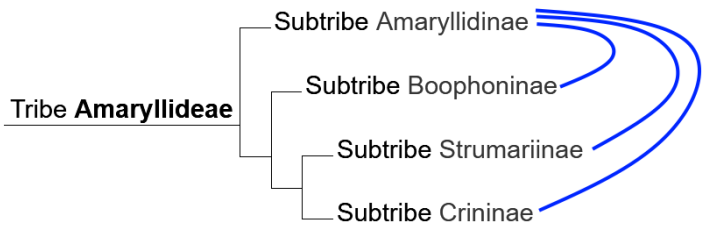
Eustephieae 4: 15.
Galantheae 5-8: 31.
Griffinieae 2: 22 *Griffinia, Worsleya*.
Haemantheae 6: 80 *Clivia, Haemanthus, …*
Hippeastreae 6: 300.
Hymenocallideae 3: 65 *Hymenocallis 50, Ismene 11, …*
Lycorideae 3: 27 *Lycoris 20, …*
Narcisseae 2: 58 *Narcissus 50* (incl. *Corbularia*°), *Sternbergia 8*.
Pancratieae 1: 20.

Amaryllideae 11: 146. **4 IG + 6 IST**

4 subtribes (en.wikipedia 2026):
Amaryllidinae 1 *Amaryllis 2*.
Boophoninae 1 *Boophone 2*.
Crininae 3 *Ammocharis 6, Crinum 65, Cybistetes 1* (included *in Ammocharis* by some authors).
Strumariinae 6 *Brunsvigia 23, Crossyne 2, Hessea 13, Namaquanula 2, Nerine 23, Strumaria 26*.

Basic type Amaryllidaceae Amarylloideae tribe Amaryllideae (11: 146): all 4 subtribes are connected by hybridization.

Amaryllis × *Ammocharis longifolia* Amaryllidinae (→× *Amaristes* Hannibal) http://de.wikipedia.org/wiki/Amaryllidoideae
Amaryllis bella-donna × *Boophone disticha* **IST** Amaryllideae × Boophoninae (→ × *Boopharyllis*) http://www.flickr.com/photos/amarguy/2742635323/ (2011), not in IPNI 2024
Amaryllis bella-donna × *Brunsvigia josephinae* **IST** Amaryllidinae × Strumariinae (→ × *Amarygia* Ciferri & Giacom. 1950 Nomencl. Fl. Ital., Pt. 1, 121; „× *Brunsdonna*“ van Tubergen ex Worsley 1925 in Gard. Chron., Ser.3, 78, 391; the latter name adopted from the old synonym *Belladonna* of *Amaryllis belladonna*) IK 1974, Willis 1985, Zander 2008, POWO 2026
Amaryllis × *Brunsvigia* × *Nerine* **IST** Amaryllidinae × Strumariinae (→ × *Traubara* Lehmiller 2010 in Herbertia 63: 255–256) IPNI 2015. POWO 2026
Amaryllis bella-donna (*„Belladonna“*) × *Crinum moorei* **IST** Amaryllidinae × Crininae (→ × *Amarcrinum* 1925 hort. ex Coutts in Gard Chron., Ser. 3, 78, 411; = × *Crindonna*° Ragioneri 1921 in Gard. Chron., Ser.3, 69, 32; = × *Crinodonna*° Stapf 1927/1929) IK 1929, Knobloch 1972, Zander 2008, POWO 2026
Amaryllis bella-donna × *Nerine bowdenii* et div. spec. **IST** Amaryllidinae × Strumarinae (→ × *Amarine* Sealy 1968 in J. Roy. Hort. Soc. London 92, 432) IK 1974, Willis 1985, BR 1992, Katsukawa et al. 1999, POWO 2026
Ammocharis × *Crinum* **IST** Amaryllidinae × Crininae (→ × *Crimocharis* Lehmiller 1999 (publ. 2000) Herbertia 54, 125) IPNI 2007 etc., AP website 2025
Brunsvigia × *Nerine* Strumariinae (→ × *Brunserine* Traub 1963 in Plant Life 19, 59) IK 1970, POWO 2026 (art. hyb.)
Crinum × *Cybistetes* (*“Ammocharis”*) *longifolia* Crininae (→ × *Crinetes* Lehmiller 2013 in Herbertia 66: 335) IPNI 2015, POWO 2025



Amaryllideae: hybrid connections in the phylogeny from en.wikipedia (2026, CC BY SA 4.0).

Cyrtantheae 1: 56

Cyrtanthus (incl. *Vallota*°) 56.

Cyrtanthus × *Vallota*° (= *Cyrtanthus* p. p.) **IS** Cyrtantheae (→ × *Vallanthus* Ciferri & Giacom. 1950 Nomencl. Fl. Ital., Pt. 1, 122; = *Cyrtanthus hybridus* N. E. Brown 1885) IK 1974

Eucharideae (incl. Stenomesseae) 10: 100. **1 IG**

Phaedranassa, Plagiolirion, Stenomesson 35, Urceolina 26 (incl. *Caliphruria*°, *Eucharis*°), …. It has been proposed to unite all or most taxa in *Urceolina.*

Caliphruria° (= *Urceolina* p. p.) × *Eucharis*° (= *Urceolina* p. p.) **IS** Eucharideae (→ × *Calicharis* A. W. Meerow 1989 in Ann. Missouri Bot. Gard. 76, 208) (nat. hyb.) IK 1991, POWO 2025 (*Urceolina butcheri*)

Eucharis° (*Urceolina*) × *Urceolina* **IS** Eucharideae (→ × *Urceocharis* Mast. 1892 Gard. Chron. ser. 3, 12: 214) (nat. hyb.) Watson 1893, IK, Knobloch 1972, now often included in *Urceolina,* POWO 2025 (*Urceolina* IS)

Phaedranassa × *Stenomesson* Eucharideae
http://forums.gardenweb.com/forums/load/amaryllishippeastrum/msg120402195545.html

Hippeastreae 7: 300. **1 IG + 1 IT**

2 subtribes (en.wikipedia 2026: the subdivision is provisional and several species have been shifted to other genera, even of the other subtribe):

Hippeastrinae *Hippeastrum 105, Zephyranthes 175* (incl. *Cooperia*°, *Habranthus*°, *Sprekelia*°, *Rhodophiala*° *bifida*)

Traubiinae *Eremolirion/Paposoa, Phycella 14* (incl. *Habranthus chilensis, Rhodophiala*° *chilensis*), *Pyrolirion* (or part of Eustephieae*), Rhodolinum, Traubia 1.*

IS: POWO 2026 *Hippeastrum 9 IS.*

Cooperia° (= *Zephyranthes* p. p.) × *Habranthus*° (= *Zephyranthes* p. p.) **IS** Hippeastrinae (→ × *Coobranthus* T. M. Howard 1990, publ. 1991 in Herbertia 46, 121) (nat. hyb.) Howard 1990, IK 1996, David 2011, POWO 2025 (*Zephyranthes* IS)

Cooperia° (= *Zephyranthes* p. p.) × *Zephyranthes* **IS** Hippeastrinae (→ × *Cooperanthes* Lancaster 1913 in Journ. Roy. Hort. Soc., Lond. 38, 531) (art. hyb.) IK 1966, Knobloch 1972, Willis 1985, David 2011, POWO 2026

Habranthus° (*Phycella!*) *chilensis* × *Hippeastrum miniatum* × *Rhodophiala*° *(Zephyranthes) bifida*
IST Hippeastrinae × Traubinae (→ × *Rhodobranthus* Traub 1958 in Plant Life 14, 48, art.

hyb.) Traub 1952, IK 1966, Knobloch 1972, Willis 1985, cf. *Phycella* × *Zephyranthes*

Habranthus° (= *Zephyranthes* p. p.) × *Sprekelia*° (= *Zephyranthes* p. p.) **IS** Hippeastrinae (→ × *Sprekanthus* Traub 1969 in Plant Life 25, 78) IK 1974, Willis 1985

Habranthus° (= *Zephyranthes* p. p.) × *Zephyranthes* **IS** Hippeastrinae (→ × *Zephybranthus* T. M. Howard 1990, publ. 1991, in Herbertia 46: 123; = „× *Sydneya*“ Traub 1954 in Plant Life 10, 47; et 1958 in Plant Life 14, 49; invalid name) (art. hyb.) (2 nothospecies) Traub 1952, IK 1966, Knobloch 1972, David 2011

Hippeastrum × *Sprekelia*° (= *Zephyranthes* p. p.) × *Zephyranthes* Hippeastrinae (→ × *Howardara* Lehmiller 2010 in Herbertia 64: 130) IPNI 2011, POWO 2026

Hippeastrum miniatum („*Amaryllis chilensis*“) × *Rhodophiala*° (= *Zephyranthes*) *bifida* Hippeastrinae Traub 1952

Hippeastrum × *Sprekelia*° (= *Zephyranthes* p. p.) **IS** Hippeastrinae (→ × *Hippeaskelia*° = × *Hippeastrelia*) see Katsukawa et al. 1999, not IPNI 2024

Hippeastrum × *Sprekelia*° (= *Zephyranthes* p. p.) × *Zephyranthes* **IS** Hippeastrinae (→ × *Howardara* Lehmiller 2010 in Herbertia 64: 130) IPNI 2011, POWO 2026

Phycella chilensis × *Zephyranthes bifida* **IST** Hippeastrinae Z. H. Feng 2024 (→ × *Zecella*) (art. hyb.) POWO 2026 (synonymous to × *Rhodobranthus* ?)

Sprekelia° (= *Zephyranthes* p. p.) × *Zephyranthes* **IS** Hippeastreae (→ × *Sprekelianthes* Lehmiller Herbertia 2003/2004 (publ. 2005) 58: 124) IPNI 2007, POWO 2026

Hymenocallideae 3: 65. **1 IG**

Hymenocallis 50, Ismene 11, …

Hymenocallis × *Ismene* (→ × *Ismenocallis*) https://www.plantdelights.com/products/ismene-sulphur-queen?srsltid=AfmBOorJ-Z7ALHhV1UYedWjMMcD6Zot_jK0n2eUI0wADyjBFKRpC7AVD 2026

Narcisseae 2: 58

Narcissus 50 (incl. *Corbularia*°), *Sternbergia 8.*

IS: POWO 2025: *Narcissus* (incl. *Corbularia*°) *133 IS.*

Corbularia° (= *Narcissus*) *bulbocodium* × *Narcissus* **IS** Narcisseae (→ × *Narcibularia* Wehrhahn 1929, Gartenstauden I, 204) IK 1947, Knobloch 1972, Willis 1985, POWO 2026

Presumed intertribal hybrids of Amaryllidoideae

Clivia × *Eucharis*° (= *Urceolina* p. p.) **IT** Haemantheae × Eucharideae (→ × *Cliveucharis* Rodigas 1891 ex Rev. Hortic. 93: 316 et ex Gard. Chron. (1891) I: 708; = × *Cliveocharis* hort.) IK, Knobloch 1972, Willis 1985, POWO 2026, IPNI 2026 (unplaced). unconfirmed!

Clivia × *Hippeastrum* **IT** Haemantheae × Hippeastreae (→ "× *Hippo–Clivia*" Bonavia) Knobloch 1972, Willis 1985, cf. http://aristongardening.blogspot.com/2009/10/clivia-miniata.html: (blog no longer available) „Gordon [Mc Neil] conducted countless hybridization experiments with his bulbs, incl. many intergeneric crosses; he was particularly proud of his putative hybrid between *Clivia miniata* and an unidentified *Hippeastrum* species, which

he named 'Green Girl', of which the author was fortunate enough to receive a plant shortly before Gordon's passing."; see also http://forums.gardenweb.com/forums/load/clivia/msg0808042426170.html?2, https://www.pacificbulbsociety.org/pbslist/2015-March/ljsr5h5lnve5dhq9hqqbpdgfu5.html (There is frequent mention of a Clivia × Hippeastrum hybrid created by the late Gordon McNeil in South Africa called 'Green Girl' but there is no evidence that I can find substantiating the claim that it is a true intergeneric cross. The picture of 'Green Girl' looks like just another nice Clivia selection, IPNI 2024 (no entry!) This hybrid is definitely unconfirmed!

Clivia × *Lycoris* **IT** Haemantheae × Lycorideae Lv et al. 2023 Sci. Hort. 319: it is a sexual „hybrid" with absolute dominance of the female parent!!

~~*Crinum* × *Leucojum* **IT**~~ Amaryllideae × Galantheae (→ „× *Leucocrinum*") http://mwalnik.wodip.opole.pl/botanika/amaryllidaceae.html erroneous: *Leucocrinum* is the accepted name of a monotypic species of Asparagaceae Agavoideae and no hybrid.

Hemerocallis × *Lycoris* **IF** Asphodelaceae Hemerocallidoideae × Amaryllidaceae Lycorideae Lv et al. 2022 (*L. aurea* × *H.* 'My Complementary', **EC**, one embryo developed into a plantlet with both intermediate and novel characteristics of parents). This appears to be the first case of an interfamily hybrid in Angiosperms. But it is obviously only a partial hybrid with absolute dominance of the female parent. Both families are part of the order Asparagales and the systematic position has changed variously.

Hippeastrum × *Sprekelia* (= *Zephyranthes* p. p.) × *Nerine* div. spec. **IT** Hippeastreae × Amaryllideae (trigeneric) Katsukawa et al. 1999 **unconfirmed**

Lycoris × *Nerine* div. spec. **IT** Lycorideae × Amaryllideae Katsukawa et al. 1999 **unconfirmed**

Nerine div. spec. × *Sprekelia*° (= *Zephyranthes* p. p.) **IT** Amaryllideae × Hippeastreae Katsukawa et al. 1999. unconfirmed

Nerine div. spec. × *Vallota*° (= *Cyrtanthus* p. p.) **IT** Amaryllideae × Cyrtantheae Katsukawa et al. 1999 unconfirmed

References:

Chase MW et al. (2009) A subfamilial classification for the expanded asparagelean families Amaryllidaceae, Asparagaceae and Xanthorrhoeaceae. Bot. J. Linnean Soc. 161, 132–136.

David JC (2011) Nomenclature of intergeneric hybrids of *Zephyranthes.* Hanburyana 5, 37–46. https://www.rhs.org.uk/about-us/pdfs/publications/hanburyana/vol-5-june-2011/nomenclature-of-intergeneric-hybrids-of-zephyranth.pdf

Howard TM (1990) × *Coobranthus coryi* T. M. Howard. A natural bigeneric hybrid of the tribe Zephyrantheae. Herbertia 46, 119–124.

Katsukawa K et al. (1999) Seed formation and germination in progenies from interspecific and intergeneric hybridization between *Nerine* and related species and genera of Amaryllidaceae. [Japanese] J. Japanese Soc. Hortic. Science 68, 900–902. confirmation needed

Lv Y et al. (2022) Interfamily wide hybridization between daylily (*Hemerocallis*, Xanthorrhoeaceae) and lycoris (*Lycoris*, Amaryllidaceae). Plant Breeding 141, 820–827. https://doi.org/10.1111/pbr.13058 cf. https://www.ishs.org/news/distant-hybridization-

hemerocallis-eremurus-and-lycoris This is the first case of an interfamily hybrid in Angiosperms, but obviously only partial
Lv Y et al. (2023) Maternal dominance of intergeneric hybridization between *Lycoris* and *Clivia*. Sci. Hort. 319. https://www.sciencedirect.com/science/article/abs/pii/S0304423823003035
Meerow AW et al. (2000) Phylogeny of the American Amaryllidaceae based on nrDNA ITS sequences. Syst. Bot. 25, 708–726.
Traub HP (1952) Biosystematic experiments involving *Zephyranthes, Habranthus* and *Amaryllis*. Taxon 1 (8), 121–123. http://www.bulbnrose.org/Amaryllis/Traub/Traub1952.html
Watson W (1893) *Urceocharis clibrani* and bigeneric hybrids. Garden and Forest 6 (256), 28–30.

Amborellaceae (Amborellales) 1: 1

Amborella trichopoda.

Basic type family Amborellaceae (1: 1): The dioecious shrub *Amborella trichopoda* endemic in New Caledonia is the only species of the whole order! It is very isolated and from a molecular view considered to be basal to all other Angiosperms.

Annonaceae (Magnoliales) 109: 2550

custard-apple family

23 subfamilies (AP website 2024)

IS: IPNI 2013: *Annona 1 IS*, *Asimina* 6 IS.

Asimina × *Deeringothamnus*° (= *Asimina* p. p.) **IS** Annonoideae Norman 2003 (nat. hyb.) (*A. pygmaea* × *D. rugelii*, *A. reticulata* × *D. pulchellus*)

References:

Norman EM (2003) Reproductive biology of *Deeringothamnus rugelii* and *D. pulchellus* (Annonaceae). Taxon 52, 547–555.

Apiaceae = Umbelliferae (Apiales) 446: 3820

umbellifers = Doldenblütler

8 main groups (subfamilies) (AP website 2024)

The large and important **family Apiaceae** has long been known for its paucity of hybrids (e.g. Bell 1971, Webb & Druce 1984), and is therefore unsuitable for basic type studies.

Apioideae 380: 3200. **3 IG**

IS: IPNI 2015: 18 IS in 8 genera.

Aciphylla div. spec. × *Anisotome* div. spec. Aciphylleae questionable, for a discussion see Webb & Druce 1984

Aciphylla squarrosa × *Gingidia montana* Aciphylleae Webb & Druce 1984 (nat. hyb. in New Zealand)

Apium graveolens × *Petroselinum crispum* (= *hortense*) Apieae Becker 1925/1926 (art. hyb., success only when *Apium* was the female parent) Lamprecht 1961, Honma & Lacy 1980

~~*Anthriscus* × *„Chaerophyllum"*~~ (→ × *Anthrichaerophyllum* P. Fournier 1937 Quatre Fl. France, 663) Scandiceae IK 1950, Knobloch 1972, Willis 1985. erroneous, according to Index synonymique France http://www2.dijon.inra.fr/flore-france/an.htm: „Erreur. Le type correspond à *Anthriscus sylvestris* subsp. *sylvestris*.", Nevertheless, this nothogenus is accepted by many authors, even in IPNI 2017 and on the AP website 2024

Berula erecta × *Helosciadium* (*"Apium"*) *nudiflorum* Oenantheae (→ × *Beruladium* A. C. Leslie 2015 in Taxon 64) Desjardins et al. 2015 (*Berula erecta* × *Helosciadium nodiflorum*, nat. hyb. Cambridgeshire, England). Formerly *Helosciadium* was grouped in *Apium* (tribe Apieae)

References:

Becker J (1925/1926) Ein neuer Gattungsbastard: *Apium graveolens* (Sellerie) gekreuzt mit *Petroselinum sativum* (Wurzelpetersilie). Z. Pflanzenzüchtung 11, 199–204. seems reliable.

Desjardins SD (2015) Intergeneric hybridisation between *Berula erecta* and *Helosciadium nodiflorum* (Apiaceae). Taxon 64, 784–794. http://dx.doi.org/10.12705/644.9.

Dudits D et al. (1979) Plant regeneration from intergeneric cell hybrids. Plant Science Letters 15 (2), 101–112.

Dudits D et al. (1980) Intergeneric gene transfer mediated by plant protoplast fusion. Molecular & General Genetics 179, 283–288.

Honma S & Lacy ML (1980) Hybridization between pascal celery and parsley. Euphytica 29, 801–805. https://doi.org/10.1007/BF00023227 *Apium* × *Petroselinum*

Lamprecht H (1961) Ein Bastard *Apium graveolens* L. × *Petroselinum hortense* Hoffm. Agri Hortique Genetica 19 (2), 223–224.

Webb CJ & Druce AP (1984) A natural intergeneric hybrid, *Aciphylla squarrosa* × *Gingidia montana*, and the frequency of hybrids among other New Zealand apioid Umbelliferae. New Zealand J. Bot. 22, 403–411.

Apocynaceae (Gentianales) 400: 5000

dogbane family = Hundsgiftgewächse

This family has been much enlarged since about 2010:
5 subfamilies, 25 tribes (AP website 2025):
Apocynoideae 77: 860.
Asclepiadoideae 214: 2365.
Periplocoideae 33: 180.
Rauvolfioideae 84: 980.
Secamonoideae 8: 160.

IS: IPNI 2013 (excl. Asclepiadoideae): 8 IS (*Apocynum 1, Malouetia 1, Mandevilla* incl. *Dipladenia° 2, Pachypodium 2, Parsonia 1, Rauvolfia 1, Tabernaemontana 1*).

Asclepiadoideae 214: 3000

milkweeds and carrion flowers = Seidenpflanzen- oder Schwalbenwurzgewächse

5 tribes:

Asclepiadeae 87: 1840.

Ceropegieae 11: 800.

Eustegieae 2: 4.

Fockeeae 2: 9.

Marsdenieae 26.

Asclepiadeae 87: 1840. **1 IG**

Asclepias woodii × *Pachycarpus concolor* Asclepiadinae Shuttleworth & Johnson 2010

Ceropegieae 12(–48): 800. **36 IG** (or 2 IG after the taxonomy of AP website 2025)(Stapeliinae)

carrion or starfish flowers = Aasblumen-Verwandte

No subtribes in AP website 2025 or in en.wikipedia 2025.

Endress et al. 2014 differentiate 4 subtribes:

Anisotominae 5: 37 *Anisotoma 4, Emplecanthus 2, Neoschumannia 2, Riocreuxia 15, Sisyranthus 14.*

Heterostemminae 1: 45 *Heterostemma 45.*

Leptadeniinae 4: 36 *Conomitra 1, Leptadenia 24, Orthanthera 7, Pentasacme 4.*

Stapeliinae 2: 330 (37 genera in Endress et al. 2014, cf. es.wikipedia 2025) *Ceropegia* (incl. *Baynesia°, Brachystelma°, Caralluma °, Decabelone°, Duvalia°, Duvaliandra°, Echidnopsis°, Edithcolea°, Frerea°, Gonostemum°, Hoodia°, Hoodiopsis°, Huernia°, Huerniopsis°, Lavrania°, Notechidnopsis°, Ophionella°, Orbea°, Orbeanthus°, Orbeopsis°, Pectinaria°, Pseudolithos°, Quaqua°, Rhytidocaulon°, Stapelia°, Stapelianthus°, Stapeliopsis°, Tavaresia°, Trichocaulon°, Tridentea°, Tromotriche°, White-Sloanea°*), *Piaranthus 16* (incl. *Obesia°*).

Basic type Asclepiadaceae Asclepiadoideae Ceropegieae subtribe Stapeliinae (22–37: 330). Kutzelnigg 2009, unpubl.: 18 of the former 37 genera according to Endress et al. (2014) are closely connected by 36 intergeneric hybrids. Possibly the basic type can be extended to the whole tribe Ceropegieae, but no hybrids are known within or with genera of the other 3 subtribes. Differences between the subtribes obviously are not big, because Stevens (AP website 2024) and en.wikipedia 2925 do not differentiate within tribe Ceropegieae, and according to Meve & Liede (2004) the tribe is monophyletic. This is also confirmed by the phylogeny of Nazar et al. 2019.

According to AP website 2025 nearly all of the following hybrids have been degraded to interspecific hybrids with the exception of *Duvalia* × *Piaranthus* and *Piaranthus* × *White-Sloanea*.

Brachystelma × *Gonostemon* (= *Stapelia* p. p.) (→ × *Gonostelma* P. V. Heath 1995 in Calyx 5, 49; = × *Brachystemon* P. V. Heath 1992 in Calyx 1, 20) IK 1996

Brachystelma × *Stapelia* (→ × *Brachypelia* 1980 G. D. Rowley, Name that Succulent, 91) IK 1987

Caralluma × *Hoodia* (→ × *Hoodialluma* G. D. Rowley 1976, publ. 1979 in Repert. Pl. Succ. 27, 4) IK1987, Albers & Meve 2002

Caralluma × *Pseudolithos* (→ × *Carallithos* 1980 G. D. Rowley, Name that Succulent, 91) IK 1987

Caralluma div. spec. × *Stapelia* (→ × *Carapelia* G. D. Rowley 1972 publ. 1974 in Repert. Pl. Succ. (I.O.S.) 23, 6) IK 1981

Duvalia × *Huernia* (→ × *Huernivalia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 77; = × *Dernia* M. Kimnach, J. N. Trager & D. Tufenkian 1993 in Cact. Succ. J. (U.S.A.) 65, 75) IK 1987, IK 1996, Albers & Meve 2002

Duvalia × *Piaranthus* (→ × *Duvaliaranthus* P. V. Bruyns 1976 in J. South Afr. Bot. 42, 365) IK 1987, Albers & Meve 2002, POWO 2025

Duvalia × *Stapelia* (→ × *Stapevalia* Cumming 2015), POWO 2025

Frerea × *Huernia* (→ × *Frernia* Barad ex M. Kimnach & J. N. Trager 1992 in Cact. Succ. J. (U.S.A.) 64, 88) IK 1996

Gonostemon × *Hoodia* (→ × *Hoodiostemon* P. V. Heath 1992 in Calyx 1, 20) IK 1996

Gonostemon × *Orbeopsis* (→ × *Orbeostemon* P. V. Heath 1992 in Calyx 1, 20) IK 1996

Gonostemon× *Stapelia* (→ × *Gonostapelia* P. V. Heath 1992 in Calyx 1, 21) IK 1996

Gonostemon × *Tavaresia* (→ × *Tavastemon* P. V. Heath 1992 in Calyx 1, 21) IK 1996

Gonostemon × *Tridentea* (→ × *Gonodentea* P. V. Heath 1993 in Calyx 3, 3) IK 1996

Gonostemon × *Tromotriche* (→ × *Gonotriche* P. V. Heath 1992 in Calyx 1, 21) IK 1996

Hoodia × *Orbea* (→ × *Hoodiorbea* G. D. Rowley 2003 Asklepios 89, 10) IPNI 2008 (*H. gordonii* × *Orbea* = *Orbeopsis lutea* → *Hoodiopsis trieneri* C. A. Lückh.; × *Hoodialluma triebneri* (Lückh.) G. D. Rowley.), POWO 2025

Hoodia × *Stapelia* (→ × *Hoodiapelia* G. D. Rowley 1976 publ. 1979 in Repert. Pl. Succ. (I.O.S.) 27, 4) IK 1987, POWO 2025

Hoodia × *Trichocaulon* (= *Hoodia* p. p.) (→ × *Hoodiocaulon* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 77) IK 1987

Hoodia × *Tromotriche* (→ × *Hoodiotriche* G. D. Rowley 2003 Asklepios 89, 10 = *Echidnopsis atlantica*) IPNI 2008 (= „× *Lueckhoffia*" White & Sloane 1935 in S. African Gard. 25: 36), POWO 2025

Huernia × *Orbea* (→ × *Huerniorbea* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 77) IK 1987

Huernia × *Stapelia* (→ × *Huernelia* G. S. Barad 1995 in Cact. Succ. J.(U.S.A.) 67, 255 = × *Stuernia* P.V. Heath 1995 in Calyx 5, 49) IK 1996, Albers & Meve 2002

Huernia × *Stapelianthus* (→ × *Huernianthus* G. S. Barad 1995 in Cact. Succ. J. (U.S.A.) 67, 255) IK 1996, Albers & Meve 2002

Huernia × *Tavaresia* Hübner & Tränkle 2011, 2025 (art. hyb.)

Huerniopsis × *White-Sloanea* (→ × *Whitesloaniopsis* G. S. Barad 1995 in Cact. Succ. J. (U.S.A.) 67, 255) IK 1996, Albers & Meve 2002

Orbea × *Stapelia* (→ × *Orbelia* 1980 G. D. Rowley, Name that Succulent, 95) IK 1987, Albers & Meve 2002, Hübner & Tränkle 2025, POWO 2025

Orbea × *Tavaresia* (= *Decabelone*) (→ × *Tavarorbea* C. C. Walker 2004 New Zealand Cact. Succ. J. 57, 103) IPNI 2008, http://oro.open.ac.uk/29405/, Hübner & Tränkle 2025

Orbea × *Tromotriche* (→ *Orbeotriche* G. D. Rowley 2011 Asklepios 109: 14) IPNI 2013

Orbea maculata × *Stapelia kwebensis* (→ × *Orbelia plowesii* (P. V. Heath) Z. H. Feng 2024 comb.

nov.

Orbeopsis × *Stapelia* (→ × *Orbeopelia* 1980 G. D. Rowley, Name that Succulent, 95) IK 1987

Piaranthus × *White-Sloanea* (→ × *Piaroanea* G. D. Rowley 2003 Asklepios 89, 11) IPNI 2008

Stapelia × *Tavaresia*° (= *Decabelone*) (→ × *Staparesia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 79) IK 1987, Albers & Meve 2002, Hübner & Tränkle 2025, POWO 2025

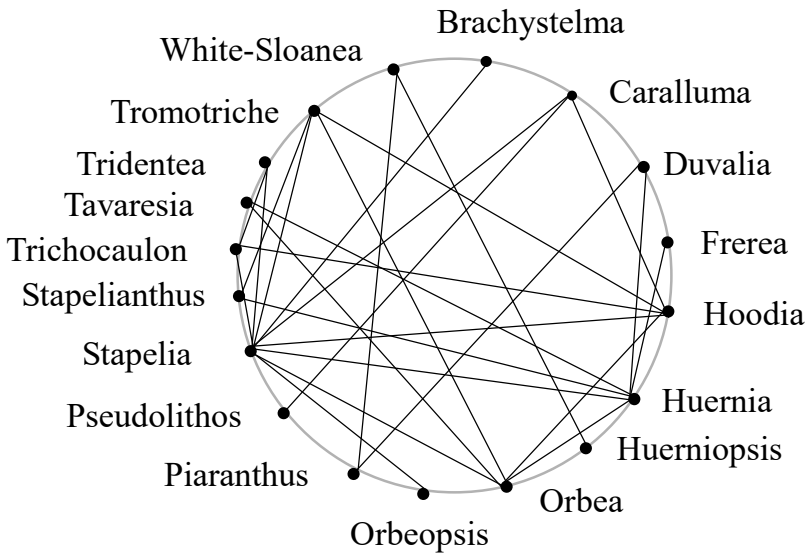
Stapelia × *Trichocaulon* (→ × *Trichopelia* 1980 G. D. Rowley, Name that Succulent, 98) IK 1987

Stapelia × *Tridentea* (→ × *Tridentapelia* 2003 G. D. Rowley Asklepios 89, 11) IPNI 2008, POWO 2025, see also: *Gonostemon*° (= *Stapelia* p. p.) × *Tridentea* (→ × *Gonodentea* P. V. Heath 1993 in Calyx 3, 3) IK 1996

Stapelia × *Tromotriche* (→ × *Tromostapelia* P. V. Heath 1992 in Calyx 1, 21) IK 1996, Albers & Meve 2002, Feng 2024

Stapelianthus decaryi × *Tromotriche aperta* (→ × *Stapelianthriche*, ined.) 2009 http://www.asclepidarium.de/Photoausstellung%20Bilder%20Hybriden.htm

Trichocaulon (= *Hoodia* p. p.) × *Tridentea* (→ × *Trichodentea* P. V. Heath 1992 in Calyx 1, 22) IK 1996



Apocynaceae Asclepiadoideae Ceropegieae subtribe Stapeliinae: hybrid connections between the main classical genera (from Kutzelnigg 2009). AP website 2025 accepts only 2 genera: *Ceropegia* and *Piaranthus*.

Marsdenieae 36: 790

Dischidia × *Hoya*, was published in 1994 in the internet as a possible intergeneric hybrid; the two genera are closely related. → *Hoya heuschkeliana* from the Philippines is supposed to be this hybrid, see e.g. http://www.dasgrueneforum.com/hoyah/hoya-heuschkeliana-t220.html, etc. The leaves closely resemble those of *Dischidia*. Original description by Kloppenburg 1989 in The Hoyan 11 (1: 2).

Rauvolfioideae 84: 980

11 tribes (AP website 2025)

Catharanthus roseus × *Rauvolfia serpentina* **IT** Vinceae × Rauvolfieae **SO** Kostenyuk et al. 1991 (only in vitro growth up to 20 months, **probably asymmetric AS**)

Catharanthus roseus × *Vinca minor* Vinceae **probably asymmetric SO** Kostenyuk et al. 1991 (see above)

Rauvolfia serpentina × *Rhazya stricta* Rauvolfieae **probably asymmetric SO** Kostenyuk et al. 1991 (see above), Sheludko et al. 2000, Gerasimenko et al. 2001 **SO** (cell subcultures)

Rauvolfia serpentina × *Vinca minor* **IT** Rauvolfieae × Vinceae **probably asymmetric SO** Kostenyuk et al. 1991 (see above)

References:

Barad GS & Lavranos JJ (1978) *Echidnopsis atlantica*, a natural intergeneric hybrid? Madoqua 11, 163–166. *Hoodia* × *Tromotriche*

Albers F & Meve U (2002) Sukkulentenlexikon 3, Asclepiadaceae. Stuttgart: Ulmer.

Albers F & Meve U (2002) Handbook of Succulent Plants. Asclepiadaceae. Berlin usw.: Springer.

Bruyns PV (1976) A new putative intergeneric Stapeliad hybrid Asclepiadaceae. J. South African Botany 42, 365–367.

Eggli U & Taylor N (1994) List of names of succulent plants other than cacti published 1950–1992 from Repertorium Plantarum Succulentarum. Kent: Whitstable Litho.

Endress ME et al. (2014) An updated classification for Apocynaceae. Phytotaxa 159, 175-194. doi: https://doi.org/10.11646/phytotaxa.159.3.2

Gerasimenko I et al. (2001) Development of an efficient system for the separation of indole alkaloids by high performance liquid chromatography and its applications. Phytochemical analysis 12, 96–103.

Hübner F & Tränkle U (2025) http://www.asclepidarium.de/Photoausstellung%20Bilder%20Hybriden.htm

International Asclepiad Society: http://www.succulent-plant.com/families/apocynaceae/asclepiadaceae.html

Kostenyuk I et al. (1991) Isolation and Characterization of intergeneric somatic hybrids in the Apocynaceae family. Theoretical & Applied Genetics 82, 713–716. somatic, asymmetric

Kutzelnigg H (2009, unpubl.) Der Grundtyp der *Stapelia*-Verwandtschaft. Apocynaceae, Subtribus Stapeliinae. Fachtagung Biologie, Studiengemeinschaft Wort und Wissen,

Liede-Schumann S & Meve U (2011) The genera of Asclepiadoideae, Secamonoideae and Periplocoideae (Apocynaceae). Descriptions, illustrations, identification, and information retrieval. http://www.bio.uni-bayreuth.de/planta2/research/databases/delta_as/triblist.html

Meve U & Liede S (2004) Subtribal division of Ceropegieae. Taxon 53, 61–72.

Meve U et al. (2017) Origin and early evolution of Ceropegieae (Apocynaceae-Asclepiadoideae). Systematics and Biodiversity 15, 143–155. https://doi.org/10.1080/14772000.2016.1238019

Nazar N et al. (2019) Phylogenetic relationships in Apocynaceae based on nuclear PHYA and plastid trnL-F sequences, with a focus on tribal relationships. Caryologia Int. J. Cytology, Cytosystematics and Cytogenetics, 72: 55–81, doi:10.13128/caryologia-251

Rowley GD (1982) Intergeneric hybrids in succulents. National Cactus and Succulent Journal 37, 76–80.

Sheludko Y et al. (2000) Divergence of the indole alkaloid pattern in two somatic hybrid plant

cell subcultures of *Rauvolfia serpentina* × *Rhazya stricta*. Planta Medica 66, 656–659.
Shuttleworth A & Johnson SD (2010) Floral scents of chafer-pollinated asclepiads and a potential hybrid. South African J. Bot. 76, 770–778. https://doi.org/10.1016/j.sajb.2010.07.023

Aquifoliaceae (Aquifoliales) 1: 600

holly family = Stechpalmengewächse

Ilex 400 (incl. *Nemopanthus° mucronatus*)

Probably **basic type family Aquifoliaceae** (1: 600) consisting of only 1 genus (*Ilex)* with many known hybrids.

IS: POWO 2025: *Ilex 6 IS.*
Ilexgarden 2026 https://ilexgarden.com/hybrids.html: *Ilex 8 IS.*
en.wikipedia 2026: "Many hundreds of hybrids and cultivars have been developed for garden use, among them the very popular "Highclere holly", *Ilex* × *altaclerensis* (*I. aquifolium* × *I. perado*) and the "blue holly", *Ilex* × *meserveae* (*I. aquifolium* × *I. rugosa*).[41] The cultivars I. × meserveae Blue Prince = 'Conablu' and Blue Princess = 'Conapri'[42] have gained the Royal Horticultural Society's Award of Garden Merit. […] Another hybrid is *Ilex* × *koehneana*, with the cultivar 'Chestnut Leaf'.

Araceae (incl. Lemnaceae) (Alismatales) 123: 3500–5500. **1 IG + 1 ISF**

Arum family, aroids = Aronstabgewächse

8 subfamilies:
Aroideae 72: 2300, Gymnostachyoideae, Lasioideae, Lemnoideae, Orontioideae, Monsteroideae 4 tribes, 12 genera. Pothoideae 2 tribes, 3 genera. Zamioculcoideae.

IS: IPNI 2015: 53 IS: *Alocasia 11 IS, Anthurium 34 IS, Arum 1 IS, Caladium 1 IS, Cryptocoryne 2 IS, Lysichiton 1 IS, Philodendron 1 IS, Spathiphyllum 1 IS, Xanthosoma 1 IS.*

Anthurium andraeanum × *Spathiphyllum wallisii* **ISF** Pothoideae Anthurieeae × Monsteroideae Spathiphylleae Yunshang et al. 2002. These 2 subfamilies are sister clades.
Alocasia odora × *Colocasia esculenta* Aroideae Colocasieae Yoshino et al. 1998. The tribe has only these 2 genera.

References:
Yoshino H et al. (1998) An artificial intergeneric hybrid between *Colocasia esculenta* (L.) Schott and *Alocasia macrorrhiza* (L.) G. Don. Monocots II. Paper given at the Second Int. Conf. on the Comparative Biology of the Monocotyledons, Sydney, 27 September–2 October 1998.
Yunshang L et al. (2002) Amplification of PCR in identification of intergeneric hybrids between *Anthurium andraeanum* and *Spathiphyllum wallisii*. J. Anhui Agricult. Univ. 29 (4), 403–406.

Araliaceae (Apiales) 43: 1450. **1 IG**

ginseng or ivy family = Araliengewächse
3subfamilies:
Aralioideae 55: 1275.
Harmsiopanax 1: 3.
Hydrocotyloideae 4: 180.

Aralioideae 41: 1275

3 tribes: Aralieae 13, Mackinlayeae 3, Schefflerieae 25.

IS: IPNI 2013 (sub Araliaceae s. str.): *Aralia 1, Nothopanax 1, Raukana° = Pseudopanax 2.*

Fatsia japonica × *Hedera helix* Schefflerieae (→ × *Fatshedera* Guillaumin 1923 in J. Soc. Nat. Hort. France, Ser. IV. 24, 524) (sterile) IK 1938, Bilquez 1957, Knobloch 1972, Willis 1985, Deghan 1987, BR 1992, Zander 2008 (× *Fatshedera lizei* originated in 1912 in the French nursery Lize Frères in Nantes by hybridization of *F. japonica* and *H. helix* or rather *H. hibernica*) http://152.1.237.188/arbweb/digital_images/2002/05-may/300/DSC01636.JPG

Pseudopanax (= *Neopanax°*) *arboreus* × *Pseudopanax crassifolius unifoliatus* **IS** Aralieae Knobloch 1972

References:

Bilquez A-F (1957) Etude des causes de la stérilité de × *Fatshedera lizei*. J. Agr. Trop. Bot. Appl. 1957, 545–547.

Dehgan B (1987) Comparative morphology of *Fatsia japonica, Hedera helix* and their hybrid *Fatshedera lizei*. J. Amer. Soc. Horticult. Science 112, 1053–1060.

Arecaceae = Palmae (Arecales) 188: 2500

palms = Palmen
Sole family of the order Arecales.
5 subfamilies (AP website 2025):
Arecoideae 14 tribes 107: 1390.
Calamoideae 21: 655.
Ceroxyloideae 8: 45.
Coryphoideae 46: 480.
Nypoideae 1: 1.

Arecoideae 107: 1390

14 tribes, e.g. Areceae, Cocoseae, …

Areceae 61: 665. **1 IG**

16 subtribes.

Veitchia macdanielsi, montgomeryana × *Wodyetia bifurcata* Ptychospermatinae 2004 (art. hyb.) Stein 2010 (*V. arecina* × *W. bifurcata*)

Cocoseae 17: 412. **5 IG**

cocoid palms = Kokospalmen-Verwandte

3 subtribes (de.wikipedia 2025/NCBI 2010):

Attaleinae 10: 248 *Allagoptera 5, Attalea 70, Beccariophoenix 3, Butia 20, Cocos 1, Jubaea 1, Jubaeopsis 1, Parajubaea 3, Syagrus 56* (9 IS), *Voaniola 1.*

Bactridinae 5: 175 *Acroconia 8, Aiphanes 29, Astrocaryum 36, Bactris 78, Desmoncus 24.*

Elaeidinae 2: 3 *Barcella 1, Elaeis 2.*

Probably **basic type Arecaceae Arecoideae Cocoseae** (10: 248): The tribe is well-defined and monophyletic. The genera *Butia* + *Jubaea* + *Syagrus* are connected by hybridization. A view on the phylogeny of Gunn (2016) shows that another 4 genera of the same subtribe are included, and that the genera of the sister clade belong to it as well, see the figure below.

Arecastrum° (= *Syagrus*) *romanzoffianum* × *Butia capitata* (→ × *Butiarecastrum*) → see: *Butia* × *Syagrus*

Attalea × *Orbignya*°(= *Attalea* p. p.) **IS** Attaleinae (→ × *Attabignya* Balick, A. B. Anderson & J. T. Medeiros-Costa 1987 in Brittonia 39, 27 = *Attalea* × *minarum* 2002 Balick, A. B. Anderson & Med.-Costa) Zona) IK 1991, Pintaud 2008

Butia capitata × *Jubaea chilensis* Attaleinae (→ × *Jubautia* Demoly 2002 (publ. 2003) J. Bot. Soc. France 18–19, 189) IPNI 2011, see also Wilcox & Raulerson 2004, POWO 2025 (nat. hyb., fertile)

Butia × *Jubaea* × *Syagrus* Attaleinae trigeneric (→ × *Jubutyagrus*) http://www.palmtalk.org/forum/index.php?showtopic=26741, Stein 2010, POWO 2025 (no entry) this hybrid is offered for sale in the internet

Butia × *Parajubaea* Stein 2010

Butia capitata (= "*Cocos australis*") × *Syagrus* (= *Arecastrum*°) *romanzoffianum* Attaleinae (→ × *Butyagrus* P. Vorster 1990 in Taxon 39, 662; = × *Butiarecastrum* Proschowsky 1921 in Rev. Hort 93 (17), 290) (art. hyb.) IK 1991, Wilcox & Raulerson 2004, POWO 2025

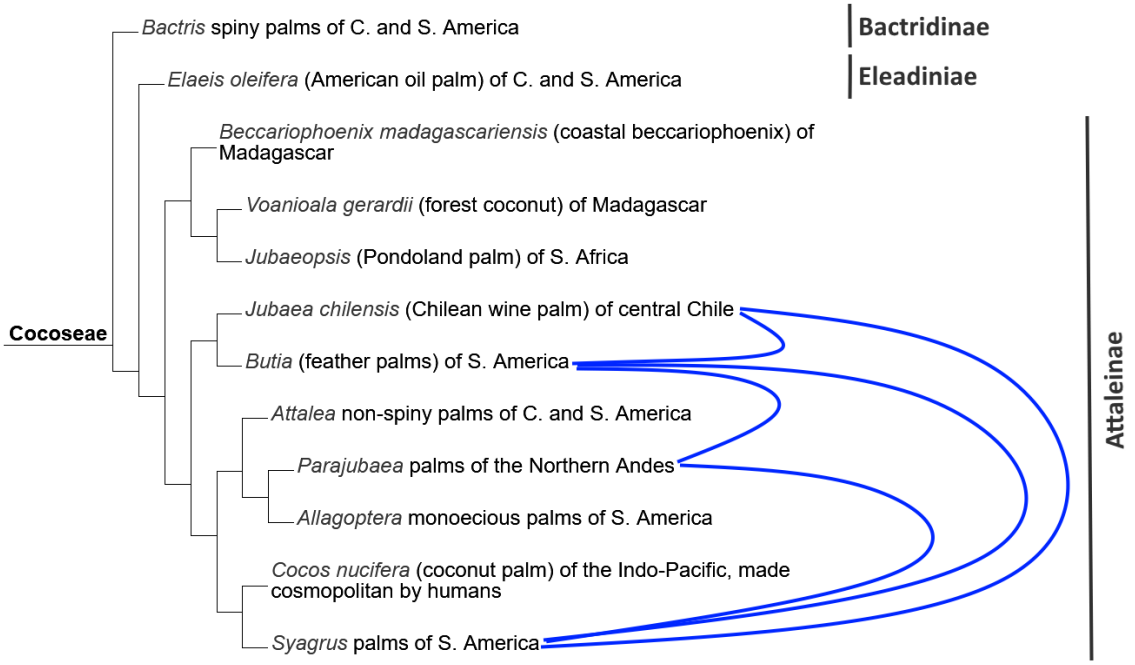
Corozo° *oleifera* (= *Elaeis* p. p.) × *Elaeis guineensis* **IS** Elaedinae Kushairi 1985, BE 1992

Jubaea × *Syagrus* Attaleinae (→ "× *Jubagrus*") Stein 2010, POWO (no entry)

Lytocaryum° (= *Syagrus* p. p.) × *Syagrus* **IS** Attaleinae (→ × *Lytoagrus* Hodel 2005 Palms (1999+) 49, 123; = *Syagrus* × *nabonnandi* 1989 (Prosch.) Demoly) IPNI 2006, Stein 2010, POWO 2025 (*Syagrus* IS)

Maximiliana° (= *Attalea* p. p.) × *Orbignya*° (= *Attalea* p. p.) **IS** Attaleinae (→ × *Maximbignya* S. F. Glassman 1999 Illinois Biol. Monogr. 59, 199; = *Attalea dahlgreniana,* which is supposed to be of hybridogeneous origin **HY**) IPNI 2006, POWO 2025 (*Attalea* IS)

Parajubaea × *Syagrus* Stein 2010



Arecaceae Arecoideae tribe Cocoseae: hybrid connections in the phylogeny of Gunn BF (2016. https://openresearch-repository.anu.edu.au/bitstreams/98d7d3c7-600e-4ead-963e-337362a11b0e/download), simplified by en.wikipedia (2026, CC BY SA 4.0).

Coryphoideae 45: 480. **2 IG**

8 tribes, e.g.
Cryosophileae 10.
Phoeniceae.
Trachycarpeae, …

Chamaerops humilis × *Phoenix dactylifera* (→ „× *Microphoenix decipiens*“ Naudin ex Carrière 1885 in Rev. Hort. [Paris] 57: 513) **IT** Trachycarpeae × Phoeniceae (art. hyb.) IK, Petrucci 1900 („unconfirmed“), Berger 1916 („unconfirmed“), Knobloch 1972, Willis 1985, POWO 2025, WFO 2025 („**unchecked**“), POWO 2025

Chamaerops humilis × *Phoenix dactylifera* × *Trachycarpus fortunei* **IT** Trachycarpeae × Phoeniceae (art. hyb.) (= „× *Microphoenix sahuti*“ Carrière 1885) IK (art. hyb.), Berger 1916 („**unconfirmed**“), POWO 2025 art. hyb., not validly published)

Coccothrinax argentata × *Thrinax morisii* Cryosophileae (Nauman 1988, 1990 (*C. argentata* × *T. morrisii*, nat. hyb. Florida)

Coccothrinax × *Zombia* Cryosophileae Stein 2010

References:

Bacon DC & Hill A (2024) Hybridization in palms (Arecaceae). Ecology and Evolution 14. https://doi.org/10.1002/ece3.70014 much information on natural interspecific hybrids

Balick MJ, Anderson AB & de Medeiros-Costa JT (1987) Hybridization in the Babassu Palm Complex. II. *Attalea compta* × *Orbignya oleifera* (Palmae). Brittonia 39, 26–36.

Berger A (1916) Die Zwergpalme, *Chamaerops humilis* L. Die Gartenwelt 20 (34), 408–409.

Gunn BF (2016) Phylogenomics of the coconut (Cocos nucifera L.). Australian National

University (PhD thesis). phylogeny of tribe Cocoseae on p. 126
Faurby S et al. (2016) An all-evidenve species-level supertree fot the palms (Arecaceae). Mol. LOhyl. Evol. 100, 57–69. https://doi.org/10.1016/j.ympev.2016.03.002
Kushairi AD (1985) Agronomic performance and genetic variability of *Elaeis oleifera* × *Elaeis guineensis* hybrids. ISOPH Newsletter 2, 12.
Nauman CE (1988) Intergeneric hybridization between *Coccothrinax* Sargent and *Thrinax* Swartz (Palmae: Coryphoideae). Amer. J. Bot. 75 (6, pt. 2), 195–196.
Nauman CE (1990) Intergeneric hybridization between *Coccothrinax* and *Thrinax* Palmae Coryphoideae. Principes 34 (4), 191–198.
PALM web https://palmweb.org
Petrucci GB (1900) Ricerche anatomiche sopra la *Chamaerops humilis* (Linn.), la *Phoenix dactylifera* (Linn.) ed i loro pretesi ibridi (*Microphoenix*). Malpighia 15, 306–360.
Pintaud JC (2008) An overview on the taxonomy of *Attalea* (Arecaceae). http://sisbib.unmsm.edu.pe/Bvrevistas/biologia/v15sup1/pdf/a06v15sup1.pdf, see also: http://www.palmsociety.com/palmsjournal/2002/vol46n3p132-133.pdf.
Proschowsky AR (1921) Un beau palmier hybride *Butiarecastrum Nabonnandi*. Revue Horticole 93, 290–291, fig. 72.
Stein G (2010) Hybrid palms. Dave's Garden https://davesgarden.com/guides/articles/view/3012/ valuable information on interspecific and intergeneric palms
Vorster P (1990) × *Butyagrus*, a new nothogeneric name for × *Butiarecastrum* (Arecaceae). Taxon 39, 662–663.
Wilcox M & Raulerson C (2004) Practical Methods for Hybridization in the Butiinae. http://www.plantapalm.com/vpe/horticulture/vpe_horticulture5.htm

Aristolochiaceae (Piperales) 8: 500

birthworts, pipevines = Osterluzeigewächse

2 subfamilies

IS: IPNI 2013: *Aristolochia* 2 IS, *Heterotropa 1 IS.*

Asclepiadaceae → Apocynaceae

Asparagaceae (Asparagales) 153: 2900

asparagus family = Spargelgewächse

This family has been much enlarged since about 2000.

7 subfamilies (AP website 2025):

Agavoideae 23: 640.

Aphyllanthoideae 1: 1 (stems alone photosynthetic).

Asparagoideae 2: 165–295.

Brodiaeoideae 12: 62.

Convallarioideae = Nolinoideae 26: 530.

Lomandroideae 12: 186.
Scilloideae (= Hyacinthaceae) 41–70: 800–1025.

P. Steven on AP website 2025 writes: „This is a highly unsatisfactory family. Nothing characterises it, and while some of the subfamilies have several distinctive apomorphies and are also easy to recognise, others are difficult to recognise ...“

Agavoideae 23: 640

agave and allies = Agavengewächse

The subdivision is still matter of debate! Genera have been shifted from one family to another! The following subdivision is preliminary.
5 tribes (AP website 2025):
Agaveae (incl. Yuccaeae) 10: 425.
Anemarrheneae 1: 1.
Anthericeae 8: 285.
Behnieae 1: 1.
Herrerieae 2: 9.

Agaveae 14: 425

Agave 270 (incl. *Bravoa°, Manfreda°, Polianthes°, Prochnyanthes°, Pseudobravoa°*), *Beschorneria, Camassia, Chlorogalum, Echinoagave, Furcraea, Hastingsia, Hesperaloe 1, Hesperocallis, Hesperoyucca, Hosta 23, Paleoagave, Paraagave, Schoenolirion, Yucca 50* (incl *Clistoyucca°, Samuela° 1,*).

The members of the large genus *Agave* s. l. (270) belong to the same basic type. At least 12 hybrids are known, including those connecting the 3 subgenera (*Agave, Littea, Manfreda*).

IS: IPNI 2018 (sub Agavaceae): *Agave 12 IS, Bravoa° 1 IS, Cordyline 5 IS, Polianthes 2 IS, Yucca 2 IS.*
All known „intergeneric hybrids“ of **tribe Agaveae** as listed below are now downgraded as interspecific within *Agave.*
For further interspecific hybrids (>12 IS) within *Agave* s. l. see: POWO and http://de.wikipedia.org/wiki/Agaven

Agave × *Manfreda°* (= *Agave* p. p.) **IS** Agaveae (→ × *Mangave* hort. ex D. Klein 2010 Kakteen And. Sukk. 61 (8), 212) Howard 2001, http://www.plantdelights.com/xMangave/products/247/, POWO 2025, now intersubgeneric hybrid *Littea mitis* (*celsii*) × *Manfreda variegata*

Agave asperrima × *Agave nickelsieae* **IS** Agaveae (→ *Agave* × *pumila*) see POWO 2025, intersubgeneric hybrid *Agave* × *Littea*

Agave × *Manfreda°* × *Polianthes°* **IS** Agaveae (→ × *Hansara*) van der Meer 2019, POWO 2025

Bravoa° (= *Agave* p. p.) × *Polianthes°* (= *Agave* p. p.) **IS** Agaveae (→ × *Bravanthes* Cif. & Giacom. 1950 Nomencl. Fl. Ital., Pt. 1, 134 = *Polianthes* p. p.) IK 1974, Willis 1985 (it is unresolved which species were involved, but consider that *Bravoa polyphylla* and *B. densiflora* have later been included in *Polianthes*), now subgenus *Manfreda* section *Bravoa*

Manfreda° (= *Agave*) div. spec. × *Polianthes*° *tuberosa* (= *Agave* p. p.) **IS** Agaveae (→ × *Polifreda* W. Ritchie & J. T. Lindstrom (*Manfreda virginica, maculosa* × *Polianthes tuberosa*), POWO 2025 now subgenus *Manfreda* section *Bravoa*

Polianthes° *geminiflora* (= *Bravoa geminiflora* = *Agave duplicata*) × *Prochnyanthes*° *viridescens* = *Agave bulliana* **IS** Agaveae (→ *Bravoa* × *kewensis* = *Agave* × *neokewensis* Thiede 2012 Haseltonia 17, 95) Thiede 2012, now subgenus *Manfreda* section *Bravoa*

Anthericeae 8: 285. 1 **IG**

Anthericum 65, Chlorophytum 150, Diamena, Echeandra 60, Leucocrinum, Paradisea, ...

Anthericum × *Paradisea* (→ × *Antherisia* 1929 Wehrhahn, Gartenstauden I, 58, 64, in obs., *Anthericum* × *Paradisea liliastrum*) IK 1947, Knobloch 1972, Willis 1985, POWO 2025

Asparagoideae 2: 165–295

Asparagus 290, Hemiphylacus 5.

Convallarioideae = Nolinoideae 26: 605

The genera have much varied in their limits and assignments to families and subfamilies.
7 tribes (AP website 2025):
Convallarieae 6: 303, Dracaeneae 1: 170, Eriospermeae 1: 100, Nolineae 4: 52, Ophiopogoneae 3: 145, Polygonateae 3: 95, Rusceae 3: 8.
Beaucarnea (incl. *Calibanus*°), *Convallaria, Dracaena* (incl. *Sansevieria*), *Nolina, Maianthemum, Polygonatum, Ruscus, ...*

IS: POWO 2025 *Dracaena 2 IS, …*

Beaucarnea recurvata × *Calibanus*° (= *Beaucarnea*) *hookeri* **IS** Nolineae presumed hybrid (→× *Calicarnea* = *Calibanus* 'Lotusland')

Dracaena × *Sansevieria*° (*Dracaena* p. p.) **IS** Dracaeneae (→ × *Dravieria*) van der Meer 2020) POWO 2025 (synonym of *Dracaena*)

Scilloideae 37: 996

4 tribes AP website 2024):
Hyacintheae 32: 566, Oziroeeae 1: 5, Ornithogaleae 1(–4): 312, Urgineae 2–3: 112

IPNI 2011 (sub Hyacinthaceae): *Hyacinthoides* 1 IS, *Lachenalia 5 IS, Muscari 1 IS, Veltheimia 1 IS.*

Ornithogaleae 1: 312

Ornithogalum (incl. *Honorius*°), …

Honorius° (= *Ornithogalum* p. p.) × *Ornithogalum* **IS** (→ × *Honogalum* J. Holub 1976 in Folia Geobot. Phytotax. 11, 81) (*Honorius boucheanus* = *Ornithogalum* (*nutans* subsp.) *boucheanum* × *Ornithogalum*) IK 1987, POWO 2025 (IS)

Hyacintheae = Scilleae 32: 566. **2 IG**

Hyacintheae are characterized by Homoisoflavones!

3 subtribes:

Hyacinthinae 21: 295 *Bellevalia 50, Chionodoxa 6, Hyacinthella 18, Hyacinthus 3, Hyacinthoides Muscari 30–50, Puschkinia 1, Scilla 30–50, ...*

Massoniinae 10: 270.

Pseudoprosperinae 1: 1.

Chionodoxa (= *Scilla* p. p.) × *Scilla* Hyacinthinae (→ × *Chionoscilla* J. Allen ex G. Nicholson 1897 in Gard. Chron. Ser. 3, 21, 191) (*Chionodoxa luciliae = forbesii* × *Scilla bifolia* → × *Chionoscilla allenii* = *Chionodoxa allenii* = *Scilla allenii*) IK 1966, Knobloch 1972, Willis 1985, AP website 2025

Puschkinia × *Scilla* Hyacinthinae (→ × *Puschkiscilla* Cif. & Giacom.) (art. hyb.) Willis 1985, POWO 2025

References:

Howard TM (2001) Bulbs for warm climates. University of Texas Press.

Thiede J (2012) *Agave bulliana* (*Prochnyanthes*) Geschichte, Einführung, Gartenkultur, Biologie & Taxonomie (bilingual). Avonia 30.

Thiede J & Eggli U (1999, 2001) Einbeziehung von *Manfreda* Salisbury, *Polianthes* Linné und *Prochnyanthes* S.Watson in *Agave* Linné (Agavaceae). Kakteen und andere Sukkulenten 50 (5) 109–113, 52 (6), 166–167. http://www.agavaceae.com/botanik/pflanzen/botanzeige_scan_en.asp?gnr=110&cat=&scan=110-3

van der Meer (2020) × *Dravieria*: Valid publication of a nothogeneric name for hybrids between *Dracaena* and *Sansevieria* (Asparagaceae). Cactologia Phantastica. https://www.researchgate.net/publication/354462462_Dravieria_Valid_Publication_of_a_Nothogeneric_Name_for_Hybrids_Between_Dracaena_and_Sansevieria_Asparagaceae

Asphodelaceae (= Xanthorrhoeaceae) (Asparagales) 41: 900–1060

aloe, asphodil and daffodil family

3 subfamilies (AP website 2024):

Asphodeloideae (formerly Agavaceae) 2 tribes 22: 850 (now including the 5 genera of the former family Aloaceae and the 8–11 genera of the former Asphodelaceae s. str.)

Hemerocallidoideae 20: 89.

Xanthorrhoeoideae 1: 30.

An interfamilial hybrid (**IF**) *Hemerocallis* × *Lycoris* (Amaryllidaceae) has been reported in 2022, but it is only a partial hybrid, not expressing the genes of both parents, see Amaryllidaceae.

Asphodeloideae 22: 850

affodils = Affodillgewächse

2 tribes:

Aloeae 12: 750.
Asphodeleae 10: 100.

Aloeae 13: 750. **23 IG**

aloe and relatives = Aloe-Verwandte

Aloe 500 (incl. *Leptaloe°, Lemeaea°, Lomatophyllum°*/ a valuable list is in af.wikipedia), *Aloestrela* 1 (formerly *Aloe suzannae*), *Aloiampelos 7, Aloidendron 7 (formerly Aloe barberae dichotoma, eminens, montana, pillansii, ramosissimum, sabaeum), Aristaloe 1, Astroloba 12* (incl. *Poellnitzia*), *Chortolirion 4, Gasteria 29, Gonialoe 3* (= *Aloe dinteri, sladeniana, variegata*), *Haworthia 150, Haworthiopsis 28, Kumara 2, Tulista 4.*

Probably **basic type Asphodelaceae Asphodeloideae tribe Aloeae** (13: 750): Kutzelnigg 2009, unpubl. The main taxa (11: 735) are connected by hybridization (23 IG). The tribe is monophyletic with a distinctive karyotype and a characteristic leaf morphology. It was for a long time known as family "Aloaceae" and Linné used a single genus *Aloe* for all species known to him. – An open question is, if the rest of the tribe can be added to this basic type.

Aloe × *Aloiampelos* (→ × *Aloiampaloe* G. D. Rowley 2014) POWO 2025

Aloe × *Aloinella°* (= *Aloe* p. p.) **IS** (→ × *Aloella* Rowley 1967 in Nat. Cact. & Succ. Journ. 22, 74) IK 1974 → see below (*Aloe* × *Lemeea°*)

Aloe × *Astroloba* (→ × *Aloloba* Rowley 1967 in Nat. Cact. & Succ. Journ. 22, 74) IK 1974, Willis 1985, Eggli 2001

Aloe × *Astroloba* × *Gasteria* (→ × *Algastoloba* D. M. Cumming 1999 Haworthiad 13, 20) Eggli 2001

Aloe × *Chamaealoe°* (= *Aloe* p. p.) **IS** (→ × *Alamaealoe* P. V. Heath 1993 in Calyx 3, 153 = „× *Alchamaloe*" Rowley 1967 in Nat. Cact. & Succ. Journ. 22, 16) IK 1974, IK 1996, Willis 1985

Aloe × *Chortolirion* (→ × *Alolirion* Rowley 1973 in Nation. Cact. Succ. J. (U. K.) 28, 7) IK 1981, Eggli 2001

Aloe div. spec. × *Gasteria* div. spec. (→ × *Gasteraloe* Guillaumin 1931 Bull. Mus. Hist. Nat. Paris, Ser.II, 3, 339; confer „× *Gastrolea kewensis*" (A. Berger) Uitew. 1949 Succulenta 1949, 12) IK 1938, IK 1950, Knobloch 1972, Willis 1985, Eggli 2001, AP website 2025

Aloe × *Gasteria* × *Haworthia* (→ × *Bayerara* D. M. Cumming 1999 Haworthiad 13, 20) (trigeneric) Eggli 2001

Aloe × *Guillauminia°* (= *Aloe* p. p.) **IS** (→ × *Allauminia* Rowley 1967 Nat. Cact. & Succ. Journ. 22, 74) **IS** IK 1974, Willis 1985

Aloe × *Guillauminia°* (= *Aloe* p. p.) × *Lemeea°* (= *Aloe* p. p.) **IS** (→ × *Bleckara* P. V. Heath 1994 Calyx 4, 146) **IS** IK 1996

Aloe × *Guillauminia°* (= *Aloe* p. p.) × *Leptoaloe°* (= *Aloe* p. p.) **IS** (→ × *Alleptauminia* D. M. Cumming 1974 in Bull. Afr. Succ. Pl. Soc. 9, 40) IK 1996

Aloe × *Haworthia* (→ × *Alworthia* G. D. Rowley 1973 in Nation. Cact. Succ. J. (U.K.) 28, 7) IK 1981, Willis 1985, Eggli 2001

Aloe × *Lemeea°* (= *Aloe* p. p.) **IS** (→ × *Allemeea* P. V. Heath 1993 Calyx 3, 153) IK 1996

Aloe × *Leptaloe°* (= *Aloe* p. p.) **IS** (→ × *Aloptaloe* P. V. Heath 1993 Calyx 3, 153 = „× *Aleptoe*" Rowley 1967 in Nat. Cact. & Succ. Journ. 22, 7) IK 1974, IK 1996

Aloe × *Lomatophyllum*° (= *Aloe* p. p.) **IS** (→ × *Lomataloe* Guillaumin 1931 in Bull. Mus. Hist. Nat. Paris, Ser. II, 3, 339) IK 1938, Willis 1985

Aloe × *Tulista* (→ × *Altulista* G. D. Rowley 2014)

Aloinella° (= *Aloe* p. p.) × *Leptaloe*° (= *Aloe* p. p.) **IS** (→ × *Leptaloinella* Rowley 1973 Nation. Cact. Succ. J. (U.K.) 28, 7) IK 1981

Apicra° (= *Haworthia* p. p. × *Haworthia* **IS** (→ × *Apworthia* 1943 Poelln. ex Journ. Roy. Hort. Soc. 68, 259, in obs.) IK 1950

Aristaloe × *Gasteria* (→ ×*Aristeria* M. H. J. van der Meer 2019)

Astroloba × *Chamaealoe*° (= *Aloe* p. p.) (→ × *Chamaeloba* D. M. Cumming 1974 in Bull. Afr. Succ. Pl. Soc. 9, 36) IK 1996 → see *Aloe* × *Astroloba*

Astroloba × *Gasteria* (→ × *Gastroloba* D. M. Cumming 1974 Bull. Afr. Succ. Pl. Soc. 9, 36) IK 1996

Astroloba × *Gasteria* × *Haworthia* (→ × *Maysara* D. M. Cumming 1999 Haworthiad 13, 115) (trigeneric) Eggli 2001

Astroloba × *Gonialoe* (→ × *Goniloba* M. H. J. van der Meer 2019) POWO 2025

Astroloba × *Haworthia* (→ × *Astroworthia* Rowley 1973 Nation. Cact. Succ. J. (U.K.) 28, 7; nat. hyb. South Africa) IK 1981, Eggli 2001

Astroloba × *Haworthiopsis* (→ × *Astroworthiopsis* M. H. J. van der Meer 2019) POWO 2025

Astroloba × *Tulista* (→ × *Astrolista* Molteno & Figueiredo Bradleya 35, 196 (2017) Cape Prov., POWO 2024

Chamaealoe° (= *Aloe* p. p.) × *Gasteria* (→ × *Chamaeteria* D. M. Cumming 1974 Bull. Afr. Succ. Pl. Soc. 9, 36) IK 1996 → see *Aloe* × *Gasteria*

Chamaealoe° (= *Aloe* p. p.) × *Leptaloe*° (= *Aloe* p. p.) **IS** (→ × *Chamaeleptaloe* Rowley 1973 in Nation. Cact. Succ. J. (U.K.) 28, 7) IK 1981

Chortolirion × *Gasteria* (→ „× *Gastrolirion*“ Walth. 1933 Cact. & Succ. Journ. Amer. 67, 468) IK 1938, Knobloch 1972, Willis 1985 (= × *Gasterlirion* Mays & G. D. Rowley 2006 Alsterworthia Int. 6 (2), 10), AP website 2025

Gasteria × *Gonialoe* (→ × *Gastonialoe* Walker 2019) POWO 2025

Gasteria × *Guillauminia*° (= *Aloe* p. p.) (→ × *Gaslauminia*° P. V. Heath 1994 Calyx 4, 146) IK 1996 see *Aloe* × *Gasteria*

Gasteria × *Haworthia* (→ × *Gasterhaworthia* Guillaumin 1931 Bull. Mus. Hist. Nat. Paris, Ser. II, 3, 339) IK 1938, Willis 1985, Knobloch 1972, Eggli 2001, AP website 2025

Gasteria × *Haworthia* × *Poellnitzia*° (= *Astroloba* p. p.) (→ × *Cummingara* G. D. Rowley 1999 Haworthiad 13, 115) (trigeneric) Eggli 2001, IPNI 2008

Gasteria × *Haworthiopsis* (→ × *Gasworthiopsis* G. D. Rowley 2014) POWO 2025

Gasteria × *Lomatophyllum*° (= *Aloe* p. p.) (→ × *Lomateria* Guillaumin 1931 Bull. Mus. Hist. Nat. Paris, Ser.II, iii, 339) IK 1938, Knobloch 1972, Willis 1985 → see *Aloe* × *Gasteria*

Gasteria × *Poellnitzia*° (= *Astroloba* p. p.) (→ × *Poellneria* Rowley 1973 Nation. Cact. Succ. J. (U.K.) 28, 7) IK 1981 see *Astroloba*× *Gasteria*

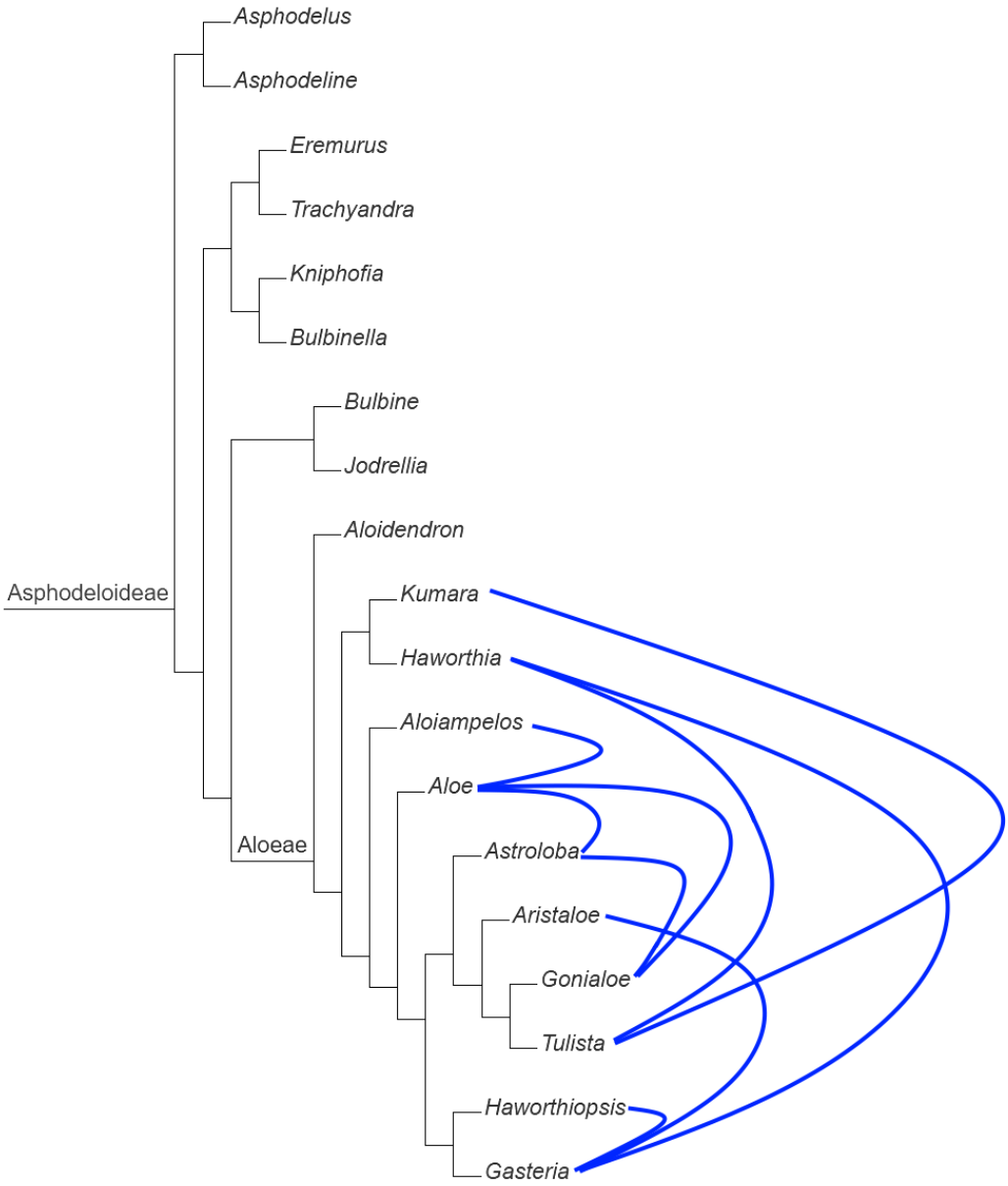
Gasteria × *Tulista* (→ × *Gastulista* G. D. Rowley 2014) POWO 2025

Gonialoe variegata × *Kumara plicatilis* (→ × *Gonimara* Gideon F. Sm. & Molteno) Smith 2018, AP website 2025, POWO 2025

Guillauminia° (= *Aloe* p. p.) × *Lemeea*° (= *Aloe* p. p.) **IS** (→ × *Leminia* P. V. Heath 1994 in Calyx 4, 146) IK 1996

Haworthia × *Haworthiopsis* (→ × Hawiopsis G. D. Rowley 2014) POWO 2025

Haworthia × *Tulista* (→ × *Tulworthia* G. D. Rowley 2014) POWO 2025
Haworthiopsis × *Tulista* (→ × *Tulworthiopsis* G. D. Rowley 2014, art. hyb.) POWO 2025
Kumara × *Tulista* (→ × *Kumalista* G. D. Rowley 2014) POWO 2025



Asphodelaceae Asphodeloideae: hybrid connections (in selection) of tribe Aloeae in the phylogeny of Devey et al. 2006 Aliso 22 (Monocots: Comparative Biology and Evolution)345–351. ISSN 0065-6275, from en.wikipedia (2026, CC BY SA 4.0).

Asphodeleae 10: 100

Asphodeline 17, Asphodelus, Bulbine 50, Bulbinella, Eremurus, Hemiphylacus, Jodrellia, Kniphofia, Simethis, Trachyandra, ...

References:

Devey DS et al. (2006) Systematics of Xanthorrhoeaceae sensu lato, with an emphasis on *Bulbine*. Aliso 22 (Monocots: Comparative Biology and Evolution):345–351.

Eggli U (1994) Sukkulenten. Stuttgart: Ulmer.
Eggli U (2001) Sukkulenten-Lexikon, Band 1: Einkeimblättrige Pflanzen (Monocotyledonen). Stuttgart: Ulmer.
Eggli U & Taylor N (1994) List of names of succulent plants other than cacti published 1950–1992 from Repertorium Plantarum Succulentarum. Kent: Whitstable Litho.
Kutzelnigg H (2009) Neue Grundtypen bei Pflanzen. Die *Aloe*-Verwandtschaft. Fachtagung Biologie der Studiengemeinschaft Wort und Wissen, unpubl.
Malakasi P-P et al. (2019/) Museomics clarifies the classification of *Aloidendron* (Asphodelaceae), the iconic African tree Aloes. Frontiers in Plant Science. doi: 10.3389/fpls.2019.01227
Smith GF & Molteno S (2019) *Aloestrela* Molteno & Gideon F. Sm. (Asphodelaceae: Alooideae), a new alooid genus with *A. suzannae* (Decary) Molteno & Gideon F.Sm. as the only species". Bradleya. 2019 (37): 3. doi:10.25223/BRAD.N37.2019.A2
Smith GF & van Wyk B-E (1991) Generic relationships in the Alooideae (Asphodelaceae). Taxon 40, 557–581.
Smith GF et al. (2018) × *Gonimara* Gideon F. Sm. & Molteno (Asphodelaceae): a new nothogenus name for the artificial hybrid, × *Gonimara corderoyi* (A. Berger) Gideon F. Sm. & Molteno, between the alooid species *Gonialoe variegata* and *Kumara plicatilis*, two southern African endemics. Bradleya 36, 53–60.
Treutlein J et al. (2003) Phylogenetic relationships in Asphodelaceae (subfamily Alooideae) inferred from chloroplast DNA sequences (rbcL, matK) and from genomic fingerprinting (ISSR). Taxon 52, 193–207.

Asteliaceae (Asparagales) 3: 31

silver spear family = Asteliengewächse

IPNI 2013: 0 IS

Astelia (incl. *Collospermum*°), *Milligania, Neoastelia*.

Astelia div. spec. × *Collospermum*° (= *Astelia* p. p.) div. spec. **IS** Moore 1980 (art. hyb., New Zealand), POWO 2025 (no entry)

References:

Moore LB (1980) Hybrid Asteliads (Liliaceae). New Zealand J. Botany 18, 37–42.

Asteraceae → see separate file

Austrobaileyaceae (Austrobaileyales) 1: 2

Austrobaileyales is a very small order with only 3 families (7: 168).

Balsaminaceae (Ericales) 2: 1050

balsam family = Balsaminengewächse

Hydrocera 1, Impatiens (incl. *Balsamina*°) *1050.*

IS: POWO 2025: *Impatiens 4 IS.*
https://www.jstor.org/stable/4119063: 9 IS in Africa.
More than 50 hybrids have been produced in *Impatiens*, often by embryo rescue, connecting divergent species.

Probably **basic type family Balsaminaceae** (2: 1050).

Begoniaceae (Cucurbitales) 2: 2000

begonia family = Schiefblattgewächse

Begonia 2000 (incl. *Symbegonia*°), *Hillebrandia sandwicensis.*

IPNI 2013: *Begonia* 54 IS.
POWO 2025: 10 accepted IS.

Possibly **basic type family Begoniaceae** (2: 2000).

Berberidaceae (Ranunculales) 14: 700

barberry family = Berberitzengewächse

3 subfamilies (AP website 2025):
Berberidoideae 2: 629 *Berberis 628* (incl. *Mahonia 60*) (6 IS), *Ranzania 1.*
Nandinoideae 4: 20 *Caulophyllum, Gymnospermium, Leontice, Nandina 1.*
Podophylloideae 8: 75 *Achlys 2–3, Bongardia 1, Diphylleia, Disosma, Epimedium 50–60, Jeffersonia, Podophyllum 12, Vancouveria.*

Aceranthus° (= *Epimedium* p. p.) × *Epimedium* **IS** Podophylloideae (→ × *Bonstedtia*° 1930 Wehrhahn, Gartenstauden 1, 455; *Epimedium* × *youngianum* 'Lilacinum' = *E. lilacinum*) IK 1947, Knobloch 1972, Willis 1985, POWO 2025 (IS)
Berberis div. spec. × *Mahonia*° *aquifolium* **IS** Berberidoideae (→ × *Mahoberberis* C. K. Schneider) Knobloch 1972, Willis 1985, IPNI 2008 (3 nothospecies), Zander 2008, POWO 2025 (IS)

Betulaceae (Fagales) 6: 145

birch family = Birkengewächse

2 subfamilies (AP website 2025)
IPNI 2013: 0 IG, 32 IS: *Alnus 10 IS, Betula 23 IS.* – POWO 2025: *Alnus 13 IS, Betula 31 IS, Carpinus 1 IS, Corylus 4 IS*

Betuloideae 2: 95.

Alnus 25–40 (incl. *Alnaster*°, *Alnobetula*°), *Betula 35–60.*

Coryloideae 4: 50

Carpinus 25–50, Corylus 15–20, Ostrya 5–8, Ostryopsis 3

Corylus avellana × *Carpinus caucasica* **ISF** Coryloideae × Betuloideae Knobloch 1972 **unconfirmed**

Carpinus × *Ostrya* **HY** Coryloideae Wang et al. 2022 (*Carpinus* sect. *Distegocarpus* is supposed to be of ancient intergeneric hybrid origin)

References:

Wang Z et al. (2022) Genomic evidence for homoploid hybrid speciation between ancestors of two different genera. Nature Communications 13, Article number: 1987.

Bignoniaceae (Lamiales) 110: 800. **2 IG**

bignonia or trumpet-creeper family = Trompetenbaumgewächse

8 tribes, e.g.:

Bignonieae 21: 400.

Catalpeae 2: 11 *Catalpa*, *Chilopsis*.

Tecomeae 12 (or 45): 55 *Campsis* 2, *Incarvillea* 66, *Tecoma*, *Tecomaria*, …

IS: POWO 2025*: Campsis 2 IS, Tecoma 1 IS.*

Catalpa bignonioides × *Chilopsis linearis* Catalpeae (→ × *Chitalpa* T. S. Elias & W. Wisura 1991 in Baileya 23, 142) (art. hyb.: *Ca. bignonioides* × *Ch. linearis* → × *Catalpa tashkentensis*) Marguard & Tipton 1990, Elias & Wisura 1991, IK 1996, Li et al. 2006 (many photos in the web), POWO 2025

Tecoma × *Tecomaria* (*"Tecoma"*) *capensis* Tecomeae Knobloch 1972

References:

Elias TS & Wisura W (1991) *Chitalpa tashkentensis* new genus new species (Bignoniaceae) an intergeneric hybrid of ornamental value. Baileya 23, 139–144.

Li JH et al. (2006) Molecular confirmation of intergeneric hybrid × *Chitalpa tashkentensis* (Bignoniaceae). HortScience 41, 1162–1164.

Marguard RD & Tipton JL (1990) Verification of an intergeneric hybrid between Desert willow and *Catalpa*. HortScience 25 (9), 1067. Chilopsis × *Catalpa*

Boraginaceae (Boraginales) 100: 1800

borage family or forget-me-not-family = Raublattgewächse

3 subfamilies, e.g. Boraginoideae.

Boraginoideae 42: 610

IS: IPNI 2013: 37 IS (*Alkanna 1, Cynoglossum 1, Echium 4, Heliotropium 1, Heterocaryum 1, Lithospermum 2, Moltkia 2, Myosotis 9, Nonea 1, Onosma 2, Pulmonaria 6, Symphytum 14*).

Procopiania° (= *Symphytum*) *circinalis* × *Symphytum icaricum* **IS** Boraginoideae (→ × *Procopiphytum* Pawlowski 1971 in Fragm. Flor. Geobot. 17, 50) IK 1981 (nat. hyb. E. Aegean Is.: *P. circinalis* × *S. icaricum*), Willis 1985, Feng et al. 2024

Brassicaceae (= Cruciferae) (Brassicales) 350: 4150

mustard or cabbage family, crucifers = Kreuzblütler

Attempts to subdivide the family are difficult and vary much as to the author. The actual solution is: either no subfamilies or a second monogeneric subfamily and 60 tribes!
Division according to AP Website 2025, Hendriks et al. 2023. German et al. 2023.
2 subfamilies: Aethionemoidae 1: 50, Brassicoideae 350: 4100, 60 tribes!

The **family Brassicaceae** (350: 4150) is a uniform group of plants with a unique flower and fruit structure etc. The uniformity is indirectly confirmed by the various and divergent attempts to divide the family, of which none is really satisfying. An extensive actual investigation by Hendriks et al. (2023) differentiates 60 tribes with one of them in the rank of a monogeneric subfamily Aethionemoideae. The authors compared the phylogenies based on nuclear or plastome genes, respectively, and found substantial differences between them. Hybridization has obviously been of high importance in the evolution of the family. The authors mention two tribes which obviously are the result of hybridization (Chorisporeae × Dentostomoneae → × Shebazieae, and Crucihimalayeae × Smelowskieae).
From a basic type view, one might tend to consider the whole family as a basic type. But the data known so far are insufficient to confirm that.
Species of Brassicaceae often do not readily cross today and many hybrids could only be achieved by overcoming crossing barriers through ovule culture or cell fusion. That is especially true for intertribal hybrids of which several have been reported (see below). But many of these "hybrids" are only partial hybrids to various degrees including nearly symmetric hybrids by cell fusion.
Anyway, all members of the **tribe Brassiceae** belong to the same basic tribe, possibly as part of a putative more extensive basic type family Brassicaceae, see below.

Aethionemoideae 1: 50. 1 tribe

Aethionemeae 1: 50 *Aethionema 50*.

Brassicoideae 350: 4100. 5 supertribes, 60 tribes

5 supertribes Arabodae, Brassicodae Camelinodae, Heliophilodae, Hesperodae.
supertribe Arabodae (provisionally): Alysseae 24: 290, Arabideae 18: 560, Asperuginoideae 1: 1, Stevenieae 3: 11.
supertribe Brassicodae: Aphragmeae 1: 11, Brassiceae 53: 243, Calepineae 3: 3, Cochlearieae 2: 30, Coluteocarpeae 1: 130, Conringieae 1: 3, Eutremeae 1: 25, Fourraeeae 2: 3, Isatideae 5:100, Kernereae 3:3, Plagiolobeae 1: 5, Schrenkielleae 1:1, Thelypodieae 34: 235, Sisymbrieae 1: 48, Thlaspideae 13: 39.
supertribe Camelinodae: Alyssopsideae 4: 9, Arabidopsideae 1: 18, Boechereae 8: 110, Camelineae 4: 16, Cardamineae 12: 350, Crucihimalayeae 3: 15, Descurainieae 6: 50, Erysimeae 1: 255, Halimolobeae 5: 40, Hemilopheae 2: 7, Lepidieae 1: 270, Malcomieae 1: 6, × Microlepidieae [= Crucihimalayeae × Smelowskieae] 17: 56, Oreophytoneae 2: 8, Physarieae 7: 133, Smelowskieae 1: 25, Turritideae 1: 2, Yinshanieae 1: 13.

supertribe Heliophilodae: Anastaticeae 13: 65, Asteae 2: 2, Biscutelleae 2: 54, Chamireae 1: 1, Cremolobeae 3: 30, Eudemeae 11: 43, Heliophileae 1: 90, Hillielleae 1: 11, Iberideae 2: 30, Megacarpaeeae 1: 9, Notothlaspideae 1: 3, Schizopetaleae 2: 16, Subularieae 2: 3.
supertribe Hesperodae: Anchonieae 10: 100, Buniadeae 1: 2, Chorisporeae 5: 64, Dontostemoneae 2: 17, Euclidieae 29: 150, Hesperideae 1: 2, × Shehbazieae 1: 1.

IS: IPNI 2018: 90 IS.
For a comprehensive compilation of intergeneric and interspecific hybrids (mainly tribe Brassiceae), see Warwick et al. (2009. http://www.brassica.info/info/publications/guide-wild-germplasm.php).

Brassiceae 53: 243. **40 IG.** For intertribal hybrids see next section.
Genera mainly according to Warwick et al. 2009. Since then, many names and circumscriptions of genera have changed. But in this case, it is not relevant for considerations in the basic type concept.
Ammosperma 2, Brassica 39, Cakile 6, Carrichtera 1, Ceratocnemum 1, Chalcanthus 1, Coincya 6 (incl. *Brassicella, Thynchosinapis*), *Conringia 6, Cordylocarpus 1, Crambe 34, Crambella 1, Didesmus 2, Diplotaxis 32, Douepea 2, Enarthrocarpus 5, Eremophyton 1, Eruca 4, Erucaria 10, Erucastrum 25, Fezia 1, Foleyola 1, Fortuynia 2, Guiraoa 1, Hemicrambe 3, Henophyton 2, Hirschfeldia incana, Kremeriella 1, Moricandia 8, Morisia 1, Muricaria 1, Mutarda* (since 2025, *arvensis, carinata, nigra,* cf. *Sinapis*), *Orychophragmus 2, Otocarpus 1, Physorhynchus 2, Pseuderucaria 2, Pseudofortuynia 1, Psychine 1, Quezeliantha 1, Raffenaldia 2, Raphanus 3, Rapistrum 2, Rytidocarpus 1, Savignya 1, Schouwia 1, Sinapidendron 4, Sinapis 5* (since 2025 only *alba, frutescens, pubescens; former Sinapis arvensis and Brassica nigra* are now part of *Mutarda*), *Succowia 1, Trachystoma 3, Vella 7, Zilla 2.*

All members of **tribe Brassiceae** (53: 243) belong to the **same basic type** (first studies by Sickinger 2003). They are connected by some 40 intergeneric hybrids. The high number of known hybrids is mainly the result of the economic importance of this group.
Some intertribal connections exist, often as partial hybrids after cell fusion. So that the basic type could be much more extensive (see above), but it is difficult to evaluate the hybrids, and further studies are necessary to clarify the situation.

Brassica × *Coincya monensis* (= *Hutera* = *Rhynchosinapis*) Warwick et al. 2009
Brassica div. spec. × *Crambe abyssinica* (= *hispanica*) Luo et al. 1996, Youping & Peng 1998, Luo & Wang 1998
Brassica div. spec. × *Diplotaxis* div. spec. Zenkteler 1990, Vyas et al. 1995 **EC**, Kirti et al. 1995 (**SO** Warwick et al. 2009 (**EC,** sex. hyb.)
Brassica div. spec. × *Enarthrocarpus lyratus* **EC** Warwick et al. 2009
Brassica × *Eruca* Knobloch 1972, Willis 1985, Belea 1992, Warwick et al. 2009
Brassica div. spec. × *Erucastrum* div. spec. **EC** Rao et al. 1996, Sarmah 1998, Mohanty et al. 2009 Warwick et al. 2009 (**EC +** sex. hyb.)
Brassica div. spec. × *Hirschfeldia incana* (= *Sinapis* p. p.) Aparajita et al. 2007, Warwick et al. 2009 (sex. hyb.)
Brassica div. spec. × *Moricandia arvensis, nitens* (→ × *Brassicomoricandia*) Toriyama et al. 1987 **SO**, Zenkteler 1990, Warwick et al. 2009, Takahata et al. 1993, Rawsthorne et al. 1998

Brassica div. spec. × *Mutarda* (= *Brassica*) *arvensis, carinata, nigra* (→ × *Brassarda* Su Liu & Z. H. Feng) Feng et al. 2024, POWO 2025

Brassica div. spec. × *Orychophragmus violaceus* Li et al. 1995 **EC**, Li et al. 1998 **EC,** Cheng et al. (sex. hyb., no EC), Ding et al. 2013, Warwick et al. 2009 (sex. hyb.)

Brassica div. spec. × *Raphanus* div. spec. (→ × *Brassicoraphanus* Sageret 1929) Karpechenko 1928, Knobloch 1972, Lefol et al. 1997, Warwick et al. 2009, POWO 2025

Brassica fruticulosa × *Sinapidodendron frutescens* Harberd & McArthur 1980, Warwick et al. 2009 (**EC**)

Brassica div. spec. × *Sinapis* div. spec. Willis 1985, Warwick et al. 2009

Brassica juncea × *Trachystoma ballii* **SO** Baldev et al. 1998 (The recombination between chloroplast genomes of the two genera is reported), Warwick et al. 2009

Ceratocnemum × *Trachystoma* (→ × *Trachycnemum* Maire & G. Samuelsson 1937 in Bull. Soc. Hist. Nat. Afr. Nord 28, 11, in obs., 335) IK 1947, Knobloch 1972, POWO 2025 (*Ceratocnemum* IS)

Coincya monensis × *Mutarda nigra* Warwick et al. 2009

Cordylocarpus × *Rapistrum* (→ „× *Rapistrella*" Pomel) (nat. hyb. Algeria) http://bibdigital.rjb.csic.es/Imagenes/O_ENG_13/O_ENG_13_0264.pdf, Knobloch 1972, Willis 1985

Diplotaxis tenuifolia × *Eruca sativa* Takahata & Hinata 1983 see Warwick et al. 2009

Diplotaxis × *Erucastrum gallicum* **EC HY** Warwick et al. 2009, suppose that the natural species *Erucastrum gallicum* is the result of the intergeneric hybridization *Diplotaxis erucoides* × *Erucastrum leucanthemum*

Diplotaxis × *Hirschfeldia incana* **EC** Warwick et al. 2009

Diplotaxis muralis × *Moricandia arvensis* Zenkteler 1990, Razmjoo et al. 1996

Diplotaxis tenuifolia × *Mutarda nigra* Warwick et a. 2009

Diplotaxis tenuifolia× *Raphanus sativus* Bang et al. 2003

Diplotaxis muralis × *Sinapidendron frutescens* **EC** Warwick et al. 2009

Diplotaxis × *Sinapis pubescens* **EC** Warwick et al. 2009

Enarthrocarpus lyratus × *Erucastrum abyssinicum* Warwick et al. 2009

Eruca sativa × *Raphanus sativus* Warwick et al. 2009

Erucastrum gallicum × *Hirschfeldia incana* Warwick et al. 2009

Erucastrum gallicum × *Mutarda nigra* Warwick et al. 2009

Erucastrum gallicum × *Raphanus sativus* Warwick et al. 2009

Erucastrum gallicum × *Sinapidendron frutescens* Warwick et al. 2009

Erucastrum gallicum × *Sinapis arvensis* Warwick et al. 2009

Hirschfeldia incana × *Mutarda nigra* Warwick et al. 2009

Hutera° (= *Coincya* p. p.) × *Rhynchosinapis*° (= *Coincya* p. p.) **IS** Sobrina Vesperinas 1988

Moricandia × *Mutarda nigra* **EC** Warwick et al. 2009

Moricandia × *Raphanus* **EC** Bang et al. 1996

Mutarda nigra (= *Brassica nigra*) × *Orychophragmus* Warwick et al. 2009

Mutarda nigra (= *Brassica nigra*) × *Raphanus sativus* **EC** Warwick et al. 2009

Mutarda nigra (= *Brassica nigra*) × *Sinapis alba* Warwick et al. 2009

Raphanus × *Sinapis* Willis 1985, Warwick et al. 2009

Sinapidodendron frutescens × *Sinapis pubescens* Warwick et al. 2009

Other tribes than Brassiceae and all intertribal hybrids **3 IG + 5 IT**

In the case of somatic hybrids produced by cell fusion it is often difficult to decide if or to what extent the progeny expresses all features of both parents. Interestingly, a small part of somatic hybrids achieved by cell fusion was able to backcross, but in these cases the question is which parts of the genetic information has been transferred. – Due to the permanent changing of tribes possibly some tribe names given below are not actual.

Arabidopsis thaliana × *Brassica* div. spec. **IT SO** Arabidopsideae × Brassiceae (→ × *Arabidobrassica* Gleba & F. W. Hoffm. 1979 Naturwiss. 66: 548) (*A. thaliana* × *B. campestris*; some of the plantlets are symmetric) Gleba & Hoffmann 1979, 1980, Nagl & Hoffmann 1981, Hoffmann & Adachi 1981 (*A. thaliana* × *B. napus*), Forsberg et al. 1994 **SO** symmetric? (*A. thaliana* × *B. oleracea*), **SO** Nitovskaya & Shakhovskii 1998a, **SO** Landgren & Glimelius 1994, Fahleson et al. 1994, POWO 2025

Arabidopsis thaliana × *Boechera furcata* **IT** Arabidopsideae × *Boechereae* Lohe & Perotti 2012 allopolyploid

Arabidopsis thaliana × *Pachycladon cheesemanii* **IT** Arabidopsideae × Microlepideae (→ × *Pachydopsis* Heenan 2008 Bot. J. Linn. Soc. 157, 543) (art. hyb.; sexually produced) Heenan et al. 2008, IPNI 2008, see Joly et al. 2008, POWO 2025

Arabidopsis thaliana × *Raphanus sativus* **IT SO** Arabidopsideae × Brassiceae Warwick et al. 2009

Armoracia rusticana × *Brassica oleracea* **IT SO** Cardamineae × Brassiceae Navratilova et al. 1997 → asymmetric

Armoracia rusticana × *Eutrema wasabi* (*Wasabia*°) **IT** Cardamineae × Eutremeae **EC** Ohi et al. 1994 → only a few plantlets, probably asymmetric

Barbarea × *Brassica napua* **IT** Cardamineae × Brassiceae **SO** Eriksson et al. symmetric?)

Boechera lemmonii × *Nevada* Boechereae Windham et al. 2014

Boechera stricta × *Borodinia laevigata* Boechereae Windham et al. 2014

Brassica × *Camelina* **IT** Brassiceae × Camelineae somatic hybrid = **SO** Narasimhulu et al. 1994 (asymmetric, no mature plants), Hansen 1998 (probably symmetric, not very vital), Sigareva & Earle 1999, Jiang et al. 2009

Brassica napus, oleracea × *Capsella bursa-pastoris* **IT SO** Brassiceae × Camelineae Sigareva & Earle (not totally symmetric), Nitovskaya et al. 1998b (asymmetric), Chen et al. 2007, 2009 (asymmetric), Warwick et al. 2009 (sex. + somatic hyb.)

Brassica napus × *Descurainia* sophia **IT SO** Brassiceae × Descurainieae somatic hybrid Warwick et al. 2009

Brassica × *Isatis* **IT** Brassiceae × Isatideae Du et al. 2009 (asymmetric and symmetric), Tu et al. 2008, 2009 (partial hybrids)

Brassica napus × *Lesquerella* (= *Physaria*) *fendleri* **IT** Brassiceae × Physarieae Skarzhinskaya et al. 1996 (**SO**, for some part probably symmetric), Huang et al. 1999 **EC**, Du et al. 2008 (sex. hyb., partial hybrids, asymmetric), see also this hybrid × *Brassica napus* sex. hyb. F1 and back cross: Schröder-Pontoppidan et al. 1999

Brassica napus × *Matthiola incana* **IT** Brassiceae × Anchonieae **EC** Luo et al. 2003 (probably **asymmetric**, F1 is partly intermediate and mixoploid, even few F2-plants could be obtained), Sheng et al. 2008

Brassica napus × *Orychophragmus* × *Rorippa indica* **IT** Brassiceae × Cardamineae **EC** Guan et al. 2007

Brassica napus × *Physaria fendleri* (= *Lesquerella* p. p.) see *Brassica* × *Lesquerella*

Brassica napus × *Rorippa indica* **IT SO** Brassiceae × Cardamineae Guan et al. 2007, Warwick et al. 2009

Brassica × *Thlaspi* **IT SO** Brassiceae × Thlaspideae Landgren & Glimelius 1994, Fahleson et al. 1994 (backcross successful!)

Camelina × *Capsella* Camelineae Zhang et al. 2020 (*C. sativa* × *C. bursa-pastoris*, art. hyb., sterile)

Camelina × *Mutarda* (= *Brassica*) *nigra* **SO** Warwick et al. 2009

Cardamine × *Iti*° **IS** Cardamineae (art. hyb.) Heenan 2003

Cheiranthus° (= *Erysimum*) *cheiri* × *Erysimum cheiranthoides* **IS** Erysimeae (→ × *Cheiranthesimum* Bois 1913 in Rev. Hort., n. s. 13, 443; = × *Cheirysimum* Janchen 1933 in Oesterr. Bot. Zeitschr. 82, 153) IK 1926, IK 1938, Knobloch 1972, Willis 1985, POWO 2025 (IS)

Chorispora vel. aff. × *Dontostemon* vel aff. **IT HY** Chorisporeae × Dentostomoneae (→ × *Shehbazieae*) (→ × *Shehbazia tibetica* D. A. German 2014) German & Friesen 2014 (the authors suppose that *Dontostemon* (= "*Nasturtium*") *tibeticum* is of hybridogeneous origin of an ancient hybridization event, rename it and place it in an own monotypic tribe), POWO 2025

Diplotaxis × *Sisymbrium* **IT** Brassiceae × Sisymbrieae Zenkteler 1990 (EC: in vitro fertilization of ovules; only up to the globular state of embryo development)

Ischnocarpus° (*Pachycladon*) *novae-zelandiae* × *Pachycladon* **IS** (Camelineae or) Microlepidieae (art. hyb.) Heenan 1999

Rapistrum × *Sisymbrium* **IT** Brassiceae × Sisymbrieae (→ × *Rapistrosymbrium* P. Fourn. ex Madiot 1932 in Le Monde des Plantes 33, 43) IK 1938, Knobloch 1972, Willis 1985, IPNI 2008 → very questionable, not mentioned in the Index of Synonyms of France, POWO 2025 (accepted)

References:

Al-Shehbaz IA et al. (2006) Systematics and phylogeny of the Brassicaceae (Cruciferae): an overview. Plant Syst. Evol. 259, 89–120.

Aparjita M et al. (2007) Wide hybridization between *Hirschfeldia incana* L. (Lagreze Fossat) and *Brassica carinata* Braun: Towards development of new genetic resource. Indian J. Plant Genetic Resources 20 (3).

Arias T et al. (2014) Diversification times among *Brassica* (Brassicaceae) crops suggest hybrid formation after 20 million years of divergence. American J. Bot. 101, 86–91.

Baldev A et al. (1998) Recombination between chloroplast genomes of *Trachystoma ballii* and *Brassica juncea* following protoplast fusion. Mol. Gen. Genet. 260, 357–361.

Bang SW (1996) Production of intergeneric hybrids between *Raphanus* and *Sinapis* and the cytogenetics of their progenies. Breeding Science 46, 45–51.

Bang SW et al. (1996) Production of intergeneric hybrids between *Raphanus* and *Moricandia*. Plant Breeding 115, 385–390.

Bang SW et al. (2003) Production of intergeneric hybrids between the C3–C4 intermediate species *Diplotaxis tenuifolia* (L.) DC. and *Raphanus sativus* L. Breed. Sci. 53 (3), 231–236.

Brezhnev DD (1960; English Transl. 1962) wide hybridization in vegetable breeding. pp. 39–

47 in Tsitsiv (ed.) Wide hybridization in plants. Jerusalem.
Chen HF et al. (2007) Production and genetic analysis of partial hybrids in intertribal crosses between *Brassica* species (*B. rapa, B. napus*) and *Capsella bursa-pastoris*. Plant Cell Reports 26 (10), 1791–1800.
Chen HF et al. (2009) Genetic and histological characterization of a novel recessive genic male sterile line of *Brassica napus* derived from a cross with *Capsella bursa-pastoris*. Euphytica 167 (1), 31–37. asymmetric
Cheng BF et al. (2002) Cytogenetic and molecular characterization of intergeneric hybrids between *Brassica napus* and *Orychophragmus violaceus*. Genome 45, 110–115. http://article.pubs.nrc-cnrc.gc.ca/ppv/RPViewDoc?issn=1480-3321&volume=45&issue=1&startPage=110
Ding L et al. (2013) Intergeneric addition and substitution of *Brassica napus* with different chromosomes from *Orychophragmus violaceus*: Phenotype and cytology. Scientia Horticulturae 164, 303–309.
Du XZ et al. (2008) Chromosome elimination and fragment introgression and recombination producing intertribal hybrids from *Brassica napus* × *Lesquerella fendleri* crosses. Plant Cell Reports 27 (2), 261–271.
Du × et al. (2009) Production and cytogenetic characterization of intertribal somatic hybrids between *Brassica napus* and *Isatis indigotica* and backcross progenies. Plant Cell Reports 28 (7), BP 1105–1113. doi: 10.1007/s00299-009-0712-4 obviously asymmetric and symmetric, cf. Tu et al. 2009.
Eriksson I et al. (1994) Intertribal somatic hybrids between *Brassica napus* and *Barbarea vulgaris* – production of in vitro plantlets. Plant Cell Reports 13, 411–416.
Fahleson J et al. (1994) Intertribal somatic hybrids between *Brassica napus* and *Thlaspi perfoliatum* with high content of the *T. perfoliatum*-Specific nervonic acid. Theoretical & Applied Genetics 87, 795–804. probably asymmetric
Forsberg J et al. (1994) Fertile somatic hybrids between *Brassica napus* and *Arabidopsis thaliana*. Plant Science 95, 213–223.
German DA et al. (2023) An updated classification of the Brassicaceae (Cruciferae). PhytoKeys 220, 127–144. doi: 10.3897/phytokeys.220.97724.
German DA & Friesen NW (2014) *Shehbazia* (Shehbazieae, Cruciferae), a new monotypic genus and tribe of hybrid origin from Tibet. Turczaninowia 17 (4), 17–23. https://www.researchgate.net/publication/270959126_Shehbazia_Shehbazieae_Cruciferae_a_new_monotypic_genus_and_tribe_of_hybrid_origin_from_Tibet
Gleba Y & Hoffmann F (1979) „*Arabidobrassica*“. Plant genome engineering by protoplast fusion. Naturwissenschaften 66, 547–554.
Gleba Y & Hoffmann F (1980) *Arabidobrassica*, a novel plant obtained by protoplast fusion. Planta (Berlin) 149 (2), 112–117.
Guan R et al. (2007a) Studies on rapeseed germplasm enhancement by use of cruciferous weed *Descurainia sophia*. Proc. GCIRC 12th Inter. Rapeseed Congr. 1, 261–265.
Guan R et al. (2007b) Studies on rapeseed germplasm enhancement by use of cruciferous weed *Rorippa indica*. Proc. GCIRC 12th Inter. Rapeseed Congr. 1, 329–332.
Hansen LN (1998) Intertribal somatic hybridization between rapid cycling *Brassica oleracea* L. and *Camelina sativa* (L.) Crantz. Euphytica 104, 173–179.

Harberd DJ & McArthur ED (1980) Meiotic analysis of some species and genus hybrids in the Brassiceae. pp. 65–87 in: Tsunoda S, Hinata K & Gomez–Campo C (eds.) *Brassica* crops and wild allies. Japan. Scientific Societies Press, Tokyo.

Heenan PB (1999) Artificial intergeneric hybrids between the New Zealand endemic *Ischnocarpus* and *Pachycladon* (Brassicaceae). New Zealand J. Botany 37, 595–601.

Heenan PB (2003) *Cardamine lacustris*, a new combination for *Iti lacustris* (Brassicaceae). New Zealand J. Bot. 40 (4), 563–569.

Heenan PB et al. (2008) An artificial intergeneric hybrid derived from sexual hybridization between the distantly related *Arabidopsis thaliana* and *Pachycladon cheesemanii* (Brassicaceae). Bot. J. Linnean Soc. 157, 533–544.

Hendriks KP et al. (2023) Global Brassicaceae phylogeny based on filtering of 1,000-gene dataset. Current Biology 33, 4052–4068.e6. https://doi.org/10.1016/j.cub.2023.08.026

Hoffmann F & Adachi T (1981) *Arabidobrassica* chromosomal recombination and morphogenesis in asymmetric intergeneric hybrid cells. Planta (Berlin) 153 (6), 586–593.

Jiang JJ et al. (2009) Intertribal somatic hybrids between *Brassica napus* and *Camelina sativa* with high linolenic acid content. Plant Cell Tissue Organ Culture 99 (1). http://www.springerlink.com/content/l227x41888118x9u/

Joly S et al. (2009) A pleistocene inter-tribal allopolyploidization event precedes the species radiation of *Pachycladon* (Brassicaceae) in New Zealand. Mol. Phylogen. Evol. 51, 365–372.

Kaneko Y & Bang SW (2014) Interspecific and intergeneric hybridization and chromosomal engineering of Brassicaceae crops. Breeding Science 64, 14–22. doi: 10.1270/jsbbs.64.14.

Karpechenko GD (1928) Polyploid hybrids of *Raphanus sativus* L. × *Brassica oleracea* L. Z. Ind. Abst. Vererbungsl. 48, 1–85.

Kirti PB et al. (1992) Production and characterization of intergeneric somatic hybrids of *Trachystoma ballii* and *Brassica juncea*. Plant Cell Reports 11 (2), 90–92.

Kirti PB et al. (1995) *Diplotaxis catholica* plus *Brassica juncea* somatic hybrids molecular and cytogenetic characterization. Plant Cell Reports 14, 593–597.

Koch MA & Mummenhoff K (2006) Editorial: Evolution and phylogeny of the Brassicaceae. Plant Syst. Evol. 259, 81–83.

Koch MA & Al-Shehbaz IA (2009) Molecular systematics and evolution of „wild" crucifers (Brassicaceae or Cruciferae), pp. 1–19 in Gupta SK (ed.) Biology and breeding of Crucifers.

Landgren M & Glimelius K (1994) A high frequency of intergenomic mitochondrial recombination and an overall biased segregation of *B. campestris* or recombined *B. campestris* mitochondria were found in somatic hybrids made within Brassicaceae. Theoretical & Applied Genetics 87 (7), 854–862. Mitochondrial recombination.

Lefol E et al. (1997) Sexual hybridisation in crosses of cultivated *Brassica* species with the crucifers *Erucastrum gallicum* and *Raphanus raphanistrum*: Potential for gene introgression. Euphytica 95 (2), 127–139.

Li Z, Liu HL & Luo P (1995) Production and cytogenetics of intergeneric hybrids between *Brassica napus* and *Orychophragmus violaceus*. Theoretical & Applied Genetics 91, 131–136.

Li Z et al. (1998) Production and cytogenetics of the intergeneric hybrids *Brassica juncea* × *Orychophragmus violaceus* and *B. carinata* × *O. violaceus*. Theoretical & Applied Genetics 96, 251–265.

Lohe AR & Perotti E (2012) Intertribal hybrid plants produced from crossing *Arabidopsis thaliana* with apomictic *Boechera*. Planta 236, 371–385.
Luo P et al. (2003) Phytogenetic studies on intergeneric hybridization between *Brassica napus* and *Matthiola incana.* Acta Bot. Sinica 45 (4), 432–437. http://www.chineseplantscience.com/img/a2.jpg **EC** asymmetric
Luo P, Lan Z-Q & Li ZY (1994) *Orychophragmus violaceus*, a potential edible-oil crop. Plant Breeding – Z. Pflanzenzüchtung 113, 83–85.
Luo P & Wang Y (1998) Intergeneric hybridization between *Brassica* species and *Crambe abyssinica*. Euphytica 101, 1–7f.
Luo P, Wang Y & Li X (1996) Studies on compatibility in intergeneric crosses between *Crambe abyssinica* and genus *Brassica*. J. Sichuan University Natural Science Edition 33, 590+.
Metz PLJ et al. (1995) Hybridization of radish (*Raphanus sativus* L.) and oilseed rape (*Brassica napus* L.) through a flower culture method. Euphytica 83, 159–168.
Mohanty A et al. (2009) Broadening the genetic base of crop brassicas by production of new intergeneric hybrid. Czech J. Genet. Plant Breed., 2009, 45(3):117–122. doi: 10.17221/35/2009-CJGPB http://cjgpb.agriculturejournals.cz/artkey/cjg-200903-0003_broadening-the-genetic-base-of-crop-brassicas-by-production-of-new-intergeneric-hybrid.php
Nagl W & Hoffmann F (1981) „*Arabidobrassica*“: Evidence for intergeneric somatic hybrid nature from electron microscopic morphometry of chromatin. Eur. J. Cell Biol. 21 (2), 227–228.
Narasimhulu SB et al. (1994) Intergeneric protoplast fusion between *Brassica carinata* and *Camelina sativa*. Plant Cell Reports 13 (11), 657–660. **SO**, asymmetric (see Hansen 1998).
Navratilova B, Siroky J, Buzek J & Havranek P (1997) Construction of intergeneric somatic hybrids between *Brassica oleracea* and *Armoracia rusticana*. Biologia Plantarum 39, 531–541. *Armoracia* × *Brassica* **SO,** asymmetric
Nitovskaya IO et al. (1998) Production of „*Brassicapsella*“ somatic hybrids based on the double inactivation of donor protoplasts. Dopov. Nats. Akad. Nauk Ukr. 0 (9), 181–186 [In Ukrainian; English abstract] probably asymmetric
Ohi M, Isoda H & Ohsawa K (1994) Production of intergeneric hybrids of *Eutrema wasabi* Maxim. and *Armoracia rusticana* Gaertn., Mey. & Scherb. by ovule culture. J. Japanese Soc. Hort. Science 63, 603–610.
Rao GU et al. (1996) Production of hybrids, amphiploids and backcross progenies between a cold-tolerant wild-Species, *Erucastrum abyssinicum* and crop brassicas. Theoretical & Applied Genetics 92, 786–790.
Rawsthorne S et al. (1998) Cellular expression pattern of the glycine decarboxylase P protein in leaves of an intergeneric hybrid between the C3–C4 intermediate species *Moricandia nitens* and the C3 species *Brassica napus*. Theoretical & Applied Genetics 96, 922–927. http://www.springerlink.com/content/0040-5752/96/6-7/
Razmjoo K et al. (1996) Photosynthetic properties of hybrids between *Diplotaxis muralis* DC., a C3 species, and *Moricandia arvensis* (L.) DC., a C3-C4 intermediate species in Brassicaceae. Genes and Genetic Systems 71, 189–192. *Diplotaxis* × *Moricandia*
Sarmah BK (1998) *Erucastrum abyssinicum* × *Brassica oleracea* hybrids obtained by ovary and ovule culture. Euphytica 102 (1), 37–45.

Scheffler JA (1994) Opportunities for gene-transfer from transgenic oilseed rape (*Brassica napus*) to related species. [Review article] Transgenic Research 3 (5), 263–278. http://www.springerlink.com/content/w616p17851455528/
Schröder-Pontoppidan M et al. (1999) Very long chain and hydroxylated fatty acids in offspring of somatic hybrids between *Brassica napus* and *Lesquerella fendleri*. Theoretical & Applied Genetics 99, 108–114.
Sheng XG et al. (2008) Production and analysis of intergeneric somatic hybrids between *Brassica oleracea* and *Matthiola incana*. Plant cell issue and organelle culture 92 (1), 55–62. asymmetric
Sickinger J (2003) Kreuzungen bei Brassicaceen unter besonderer Berücksichtigung der Systematik dieser Familie und tribusübergreifender Kreuzungen. Studienarbeit (unpubl.). University of Essen.
Sigareva M & Earle ED (1997) *Capsella bursa-pastoris*: regeneration of plants from protoplasts and somatic hybridization with rapid cycling *Brassica oleracea*. Cruciferae Newsletter 19, 57–58. symmetric.
Sigareva MA & Earle ED (1999) Camalexin induction in intertribal somatic hybrids between *Camelina sativa* and rapid-cycling *Brassica oleracea*. Theoretical & Applied Genetics 98, 164–170. Original cross by Hansen 1998
Skarzhinskaya M et al. (1996) Production of intertribal somatic hybrids between *Brassica napus* L. and *Lesquerella fendleri* (Gray) Wats. Theoretical & Applied Genetics 93, 1242–1250. cf. http://www.intas.be/catalog/94-2019.htm
Sobrino Vesperinas E (1988) Obtainment of some new intergeneric and interspecific hybrids between wild Brassiceae. Candollea 43 (2), 499–504. *Hutera = Coincya = Rhynchosinapis*.
Takahata Y (1990) Production of intergeneric hybrids between a C–3–C–4 intermediate species *Moricandia arvensis* and a C–3 species *Brassica oleracea* through ovary culture. Euphytica 46 (3), 259–264.
Takahata Y et al. (1993) Wide hybridization between *Moricandia* arvensis and *Brassica* amphidiploid species (*B. napus* and *B. juncea*). Euphytica. 69, 155–160.
Toriyama K et al. (1987) Production of somatic hybrid plants *Brassicomoricandia* through protoplast fusion between *Moricandia arvensis* and *Brassica oleracea*. Plant Science (Shannon) 48 (2), 123–128.
Tu Y er al. (2008) Production and characterization of intertribal somatic hybrids of *Raphanus sativus* and *Brassica rapa* with dye and medicinal plant *Isatis indigotica*. Plant Cell Reports 27 (5), 873–883.http://www.springerlink.com/content/jwh5n3766kn87q04/
Tu Y et al. (2009) Chromosome elimination, addition and introgression in intertribal partial hybrids between *Brassica rapa* and *Isatis indigotica*. Ann. Bot. 103 (7) 1039–1048.
Ueno O et al. (2006) Evidence from photosynthetic characteristics for the hybrid origin of *Diplotaxis muralis* from a C-3–C-4 intermediate and a C-3 species. Plant Biol. 8, 253–259.
Vyas P et al. (1995) Production of wide hybrids and backcross progenies between *Diplotaxis erucoides* and crop brassicas. Theoretical & Applied Genetics 90, 549–553.
Warwick SI et al. (eds.) (2009) Guide to the wild germplasm. *Brassica* and allied crops (tribe Brassiceae, Brassicaceae). III. Interspecific and intergeneric hybridization. Ed. 3. Ottawa (Ontario, Canada): Centre for Land and Biological Resources Research, Minister of Supply and Services Canada. http://www.brassica.info/info/publications/guide-wild-

germplasm.php. 462 references!
Warwick SI et al. (2010) Closing the gaps: phylogenetic relationships in the Brassicaceae based on DNA sequence data of nuclear ribosomal ITS region. Plant Systematics and Evolution 285, 3–4, 209–232.
Windham MD et al. (2014) Newly documented hybrids in the tribe Boechereae (Brassicaceae) challenge current generic circumscriptions in the group. p. 217 in Botany 2014. New Frontiers in Botany.
Youping W & Peng L (1998) Intergeneric hybridization between *Brassica* species and *Crambe abyssinica*. Euphytica 101, 1–7.
Zenkteler M (1990) In-vitro fertilization of ovules of some species of Brassicaceae. Plant Breeding 105, 221–228.
Zhang XL et al. (2013) Genomic change, retrotransposon mobilization and extensive cytosine methylation alteration in *Brassica napus* introgressions from two intertribal hybridizations. PLOS ONE 8 (2).
Zhangh C-J et al. (2020) Hybridization between *Camelina sativa* (L.) Crantz and common *Brassica* weeds. Industrial Crops and Products 147, Art.-Nr. 112240.

Bromeliaceae (Poales) 82: 3650. **in total: 70 IG + 8 IT + 8 ISF**

bromeliads, pineapple family = Ananasgewächse, Bromelien

AP website 2025: 8 subfamilies (see the figure below) (until 2004 Pitcairnioideae included Lindmanioideae, Brocchinioideae, Hechtioideae and Puyoideae):
Brocchinioideae 1: 20.
Bromelioideae 41: 995.
Hechtioideae 1: 78.
Lindmanioideae 1–2: 43.
Navioideae 5: 107.
Pitcairnioideae s. str. 5: 642.
Puyoideae 1: 225.
Tillandsioideae 21: 1450 (4 tribes).

For compilations of intergeneric hybrids, see the website of the Bromeliad Society International **BSI** https://bsi.org, the official Bromeliad Registry https://registry.bsi.org/index.php and the Florida Council of Bromeliad Societies: http://fcbs.org. Pictures from nearly all bigeneric taxa and several articles on hybridization techniques are available from http://fcbs.org/pictures.htm.

Probably **basic type family Bromeliaceae** (78: 3650). The family is uniform and all 8 subfamilies have much in common. Hybrids connect directly or indirectly all subfamilies except the 2 small basal monogeneric subfamilies Brocchinioideae and Lindmanioideae, if compared with the phylogeny of Givnish et al. 2011, see the figure below. First basic type studies were presented by Neuhaus (1995) with the headline: "The bromeliad family: one or several basic types?" Since then, the taxonomy has been much changed, and several new hybrids were found.

Bromelioideae 41: 995. **57 IG** (+ **2 ISF)**

1 tribe, fleshy fruits.

Kessous et al. (2025) separate genus *Bromelia* from the rest of the subfamily (no intergeneric hybrids known).

Aechmea 244, Billbergia 63, Bromelia 70, Cryptanthus 66, Hohenbergia 49, Neoregelia 123, Nidularium 47, Orthophytum 67, …

Aechmea × *Ananas* (→ × *Anamea* Anon. 1979, Int. Checklist Bromel. Hybrids) Neuhaus 1995, Grant & Zijlstra 1999

Aechmea × *Androlepis* (→ × *Androlaechmea* C. Chev. 1951, Bull. Bromeliad Soc. 1, 24) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011, AP website 2025

Aechmea × *Billbergia* (→ × *Billmea* K. Williams 1974, J. Bromeliad Soc. 24, 26) Neuhaus 1995, IPNI 2011, AP website 2025

Aechmea × *Canistropsis* (→ × *Aechopsis* D. Butcher 1999 J. Bromeliad Soc. 49, 14) IPNI 2011

Aechmea × *Canistrum* (→ × *Canmea* Racine C. Foster & M. B. Foster 1973, J. Bromeliad Soc. 23, 175) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Cryptanthus* (→× *Cryptmea* E. L. Smith 1983, J. Bromeliad Soc. 33, 72) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Hohenbergia* (→ × *Hohenmea* B. R. Silva & L. F. Sousa 2003 J. Bromeliad Soc. 53, 73) IPNI 2008, AP website 2025

Aechmea × *Hohenbergia* × *Quesnelia* (→ *Hohenquesmea* M. H. J. van der Meer 2019), POWO 2025

Aechmea × *Hohenbergiopsis* (→ × *Aechbergiopsis* M. H. J. van der Meer 2019), POWO 2025

Aechmea × *Neoregelia* (→ × *Neomea* M. B. Foster 1958 in Bromeliad Soc. Bull. 8, 75) IK 1981, Neuhaus 1995, Grant & Zijlstra 1999, AP website 2025

Aechmea × *Canistrum* × *Quesnelia* (→ „× *Quesistrumea*") (trigeneric) Chayangsu 2009 http://forums.gardenweb.com/forums/load/bromeliad/msg121020076866.html?11

Aechmea × *Canistrum* × *Neoregelia* × *Quesnelia* (→ „× *Chayangsuara*") (tetrageneric) Chayangsu 2009 http://forums.gardenweb.com/forums/load/bromeliad/msg121020076866.html?11

Aechmea × *Nidularium* (→ × *Nidumea* L. B. Smith 1968 in Bromeliad Soc. Bull. 18, 63; cf. Gray Herb. Card Cat.) IK 1974, Willis 1985, Neuhaus 1995, Grant & Zijlstra 1999

Aechmea × *Orthophytum* (→ × *Orthomea* E. L. Smith 1983, J. Bromeliad Soc. 33, 75) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Portea* (→ × *Portemea* Ariza-Julia 1978, J. Bromeliad Soc. 28, 21) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Pseudananas* (→ × *Pseudanamea* H. U. Baensch & U. Baensch 1994 Blüh. Bromel.: 249; Bloom. Bromel.: 249) Neuhaus 1995, Grant & Zijlstra 1999, POWO 2025 (includes *Pseudananas* in *Ananas*), BSI 2025 (IS)

Aechmea × *Quesnelia* (→ × *Quesmea* E. Knobloch 1972, J. Bromeliad Soc. 22, 58) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Sincoraea* (→ × *Sincoraechmea* M. H. J. van der Meer 2019), POWO 2025

Aechmea × *Streptocalyx* (→ × *Streptomea* E. L. Smith 1983, J. Bromeliad Soc. 33, 75) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Aechmea × *Ursulaea* (→ × *Ursumea* D. Butcher 2005, J. Bromeliad Soc. 55, 56)

Aechmea × *Wittrockia* (→ × *Wittmea*) BSI 2025

Ananas × *Cryptanthus* (→ × *Cryptananas* D. A. Beadle 1991, Prelim. Listing Cultivar Grex Names Bromel.: 36) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Ananas × *Neoregelia* (→ × *Anagelia* E. L. Smith 1983, J. Bromeliad Soc. 33, 72) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Ananas × *Pseudananas* (→= × *Anananananas* D. A. Beadle 1991, Prelim. Listing Cultivar Grex Names Bromel.: 20. Jun 1991 = „× *Anapseudananas*“) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Androlepis × *Ursulaea* (→ × *Ursulepis*) 2025

Billbergia × *Cryptanthus* (→ ×°*Biltanthus* Roehrs 1947, Exotics 12; = × *Cryptbergia* M. H. J. van der Meer 2019) IK 1981, Neuhaus 1995, Grant & Zijlstra 1999, AP website 2025, POPWO 2025

Billbergia × *Neoregelia* (→ × *Neobergia* E. L. Smith 1983, J. Bromeliad Soc. 33, 73) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Billbergia × *Nidularium* (→ × *Nidbergia* D. Butcher 1982, Checklist Bromel. Hybrids Australia: 28) Neuhaus 1995, Grant & Zijlstra 1999

Billbergia × *Puya* (→× *Puybergia* van der Meer 2022 = „× *Billya*“ van der Meer 2019) **ISF** Bromelioideae × Puyoideae

Billbergia × *Quesnelia* (→× *Billnelia* A. D. Hawkes 1959, Bromel. Pap. 1(6): 52 = × *Billque*° incorrect name) Neuhaus 1995, Grant & Zijlstra 1999

Canistropsis° (= *Aechmea* p. p.) × *Neoregelia* (→× *Neostropsis* D. Butcher 1999 J. Bromeliad Soc. 49 (1): 14, contrary to Art. H. 6.2 ICBN (1994)) IPNI 2011

Canistrum × *Neoregelia* (→× *Canegelia* D. Butcher 1991, Hybridist's Handb., Ed. 3: 2; = „× *Neoistrum*“ M. H. J. van der Meer 2019) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011, POWO 2025

Canistrum × *Nidularium* (→× *Nidulistrum* A. D. Hawkes 1963, Bromel. Pap. 3 (9): 85 = × *Canularium* M. H. J. van der Meer 2019) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011, POWO 2025

Canistrum × *Quesnelia* (→× *Quesistrum* H. Graf ex D. A. Beadle 1998, Brom. Cult. Reg.: 350) Butcher 2008

Cryptanthus × *Forzzaea* (→ × *Forzzanthus* M. H. J. van der Meer 2019), POWO 2025

Cryptanthus× *Rokautskya* (→ × *Rokautanthus* M. H. J. van der Meer 2019), POWO 2025

Cryptanthus × *Neoregelia* (→ × *Neotanthus* M. B. Foster 1978, Grande 1 (1), 21.) Neuhaus 1995, Grant & Zijlstra 1999

Cryptanthus × *Orthophytum* (→ × *Orthotanthus* Anon. (hort.) 1974 in J. Bromeliad Soc. 24, 26) IK 1981, Neuhaus 1995, Grant & Zijlstra 1999, AP website 2025, BSI 2025

Cryptanthus × *Sincoraea* (→ × *Sincortanthus*) 2025

Deuterocohnia × *Orthophytum* **ISF** Pitcairnioideae × Bromelioideae (→ × *Orthocohnia* M. H. J. van der Meer 2019) POWO 2025 (art. hyb.) https://tropiflora.com/products/xorthocohnia-surprise (interestingly, this cross was made by R. Lemieux in 1996 at a time when he did not know that the two parents belong to different tribes)

Forzzaea × *Rokautskya* (→ × *Forzzautskya* M. H. J. van der Meer 2019), POWO 2025

Hohenbergia × *Portea* (→ × *Hohentea* D. A. Beadle 1991, Prelim. Listing Cultivar Grex Names Bromel.: 89) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Hohenbergia × *Quesnelia* (→ × *Hohenelia* D. Butcher 2002 J. Bromeliad Soc. 52, 51) Butcher 2005

Hohenbergiopsis × *Neoregelia* (→ × *Neobergiopsis* D. Butcher 2001 J. Bromeliad Soc. 51, 7) Butcher 2005, IPNI 2011

Lapanthus × *Sincoraea* (→ × *Lapacoraea*) BSI 2022

Neoglaziovia × *Orthophytum* (→ × *Orthoglaziovia* Lawn 2012, J. Bromeliad Soc. 61 (5): 234 (figs. 1–2)

Neoglaziovia × *Syncoraea* (→ × *Sincorglaziovia*) BSI 2025

Neoregelia × *Nidularium* (→ × *Neolarium* M. H. J. van der Meer 2019, × *Niduregelia* A. D. Hawkes 1963 in Bromel. Pap. 3 (9), 85) Neuhaus 1995, Grant & Zijlstra 1999, AP website 2025, POWO 2025

Neoregelia × *Sincoraea* (→ × *Sincoregelia* M. H. J. van der Meer 2019), POWO 2025

Neoregelia × *Orthophytum* (→ × *Neophytum* M. B. Foster 1958 in Bromeliad Soc. Bull. 8, 73) IK 1981, Neuhaus 1995, Grant & Zijlstra 1999, AP website 2025

Neoregelia × *Quesnelia* (→ × *Quesregelia* J. F. Carrone 1983 in Bromeliad Soc. 33, 207) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Neoregelia × *Wittrockia* (→ × *Neorockia* 1999 D. Butcher, J. Bromeliad Soc. 49: 14) Butcher 2005, IPNI 2011

Nidularium × *Orthophytum* (→ × *Ortholarium* Racine C. Foster & M. B. Foster 1973 in J. Bromeliad Soc. 23, 175) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011 (Attention: 11 species of *Orthophytum* have been transferred into the reactivated genus *Sincoraea*, the hybrid is named × *Nidosincoraea*)

Nidularium antoineanum × *Quesnelia lateralis* (→ × *Nidunelia rodriguana*) 2025 https://ui.adsabs.harvard.edu/abs/2025Phytx.692....1L/abstract, https://bromeliad.nl/encyclopedia/index.php?find=xNidunelia%252frodrigoana

Nidularium × *Sincoraea* (→ × *Nidusincoraea* M. H. J. van der Meer 2019), POWO 2025

Nidularium × *Streptocalyx* (= *Aechmea* p. p.) (→ × *Streptolarium* D. A. Beadle 1991 in Prelim. Listing Cultivar Grex Names Bromel.: 201) Grant & Zijlstra 1999, IPNI 2011

Orthophytum × *Sincoraea* (→ × *Sincorphytum*) BSI 2025

Rokautskya × *Sincoraea* (→ × *Rokautsincoraea*) BSI 2025

Brocchinioideae 1: 20

Brocchinia (incl. *Ayensua*°).

Hechtioideae 1: 78. **(2 ISF)**

Hechtia.

Deuterocohnia × *Hechtia* **ISF** Pitcairnioideae s. str. × Hechtioideae (→× *Hechcohnia* G. H. Anderson ex J. R. Grant 1998 Selbyana 19 (1): 117) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Dyckia × *Hechtia* **ISF** Pitcairnioideae s. str. × Hechtioideae (→ × *Dycktia* D. A. Beadle 1991 in Prelim. Listing Cultivar Grex Names Bromel.: 82) Neuhaus 1995, Grant & Zijlstra 1998, IPNI 2011

Lindmanioideae 1–2: 43

Connelia 5, Lindmania 39.

Navioideae 5: 107

Brewcaria, Cottendorfia, Navia 94, Sequencia, Steyerbromelia.

Pitcairnioideae s. str. 5: 642. **7 IG (+ 5 ISF)**

Deuterocohnia 18, Dyckia 175, Encholirium 22, Fosterella 34, (= *Pitcairnia* p. p.), *Pitcairnia 409* (incl. *Pepinia*°).

Deuterocohnia × *Dyckia* Pitcairnioideae s. str. (→ × *Dyckcohnia* G. H. Anderson ex J. R. Grant 1998 Selbyana 19 (1): 116) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Deuterocohnia × *Hechtia* **ISF** Pitcairnioideae s. str. × Hechtioideae (→× *Hechcohnia* G. H. Anderson ex J. R. Grant 1998 Selbyana 19 (1): 117) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Deuterocohnia × *Orthophytum* **ISF** Pitcairnioideae s. str. × Bromelioideae (→× *Orthocohnia* Lawn ex M. H. J. van der Meer 2019)

Deuterocohnia brevifolia × *Pitcairnia hartwigii* Pitcairnioideae s. str. (→ × *Deuterocairnia* D. Butcher 2002 J. Bromeliad Soc. 52, 51) Butcher 2008 (The hybrid is well documented, the *Pitcairnia* species involved was collected in Mexico in the 1980's, but has not yet been officially described), not IPNI 2013

Deuterocohnia × *Puya* **ISF** Pitcairnioideae s. str. × Puyoideae (→ × *Pucohnia* G. H. Anderson ex D. A. Beadle 1991 in Prelim. Listing Cultivar Grex Names Bromel.: 200) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Dyckia × *Encholirium* Pitcairnioideae s. str. (→ × *Dicklirium*) BSI 2025

Dyckia × *Hechtia* **ISF** Pitcairnioideae s. str. × Hechtioideae (→ × *Dycktia* D. A. Beadle 1991 in Prelim. Listing Cultivar Grex Names Bromel.: 82) Neuhaus 1995, Grant & Zijlstra 1998, IPNI 2011

Dyckia × *Pitcairnia* Pitcairnioideae s. str. (→ × *Pitkia*) BSI 2025

Dyckia × *Puya* **ISF** Pitcairnioideae s. str. × Puyoideae (→ × *Puckia* 2002 D. Butcher 2002 J. Bromeliad Soc. 52, 52)

Encholirium × *Puya* Pitcairnioideae s. str. (→ × *Pulirium*) BSI 2025

Encholirium × *Hechtia* Pitcairnioideae s. str. (→ × *Enchotia*) BSI 2025

Fosterella × *Pitcairnia* Pitcairnioideae s. str. (→ × *Piterella*) BSI 2025

Pepinia° (= *Pitcairnia*) × *Pitcairnia* **IS** Pitcairnioideae s. str. (→ × *Pitinia* J. Irvin ex Baskerville, 1998 in J. Bromeliad Soc. 48 (2), 64, for the cultivar 'Coral Horizon' formed by the cross *Pitcairnia rubronigrifolia* × *Pepinia corallina* by Jim Irvin, registered by the Bromeliad Society International 01–20–94) Grant & Zijlstra 1998, IPNI 2011

Puyoideae 1: 225. **(3 ISF)**

Puya 225.

Billbergia × *Puya* **ISF** Bromelioideae × Puyoideae (→× *Puybergia* van der Meer 2022 = „× *Billya*" van der Meer 2019)

Deuterocohnia × *Puya* **ISF** Pitcairnioideae s. str. × Puyoideae (→ × *Pucohnia* G. H. Anderson ex

D. A. Beadle 1991 in Prelim. Listing Cultivar Grex Names Bromel.: 200) Neuhaus 1995, Grant & Zijlstra 1999, IPNI 2011

Dyckia × *Puya* **ISF** Pitcairnioideae s. str. × Puyoideae (→ × *Puckia* 2002 D. Butcher 2002 J. Bromeliad Soc. 52, 52)

Tillandsioideae 22: 1450. **6 IG + 8 IT**

Seeds plumose.

3 tribes (AP website 2025):

Catopsideae 2 *Catopsis 18, Glomeropitcairnia* (or own tribe).

Tillandsieae 2 *Gregbrownia, Tillandsia 800* (AP website includes now: *Barfussia°, Guzmania° 215, Lemeltonia°, Pseudalcantarea°, Racinaea° 61, Wallisia°*).

Vriesieae 13 *Alcantarea 23, Arachnandra, Cipuropsis, Goudaea, Jagrantia, Josemania, Lutheria, Mezobromelia 9, Stigmatodon, Vriesea, Waltillia, Werauhia 87, Zizkaea*.

Alcantarea × *Vriesea* Vriesieae (→ × *Vriecantarea* J. R. Grant 1996 in Phytologia 79, 256) Grant & Zijlstra 1999, IPNI 2011, de Souza et al. 2017, POWO 2025

Barfussia° (= *Tillandsia*) × *Racinaea°* (= *Tillandsia*) **IS** Tillandsieae BSI 2025

Barfussia° × *Vriesea* **IT** Tillandsieae × Vriesieae (→ × *Barvriesea* Lawn ex M. H. J. van der Meer 2019), POWO 2025

Barfussia° (= *Tillandsia*) × *Wallisia°* (= *Tillandsia*) **IS** Tillandsieae (→ × *Wallfussia* Lawn ex M. H. J. van der Meer 2019), POWO 2025

Goudaea × *Tillandsia* **IT** Vriesieae × Tillandsieae (→ × *Tilgoudaea*) BSI 2025

Goudaea × *Vriesea* Vriesieae (→ × *Vriesgaudaea* Lawn ex M. H. J. van der Meer 2019), POWO 2025

Goudaea × *Zizkaea* Vriesieae (→ × *Zizkagoudaea* Lawn ex M. H. J. van der Meer 2019), POWO 2025

Guzmania° (= *Tillandsia*) × *Tillandsia* **IS** Tillandsieae (→ × *Guzlandsia* Anon. 1979 in Int. Checklist Bromel. Hybrids: 35) Neuhaus 1995, Grant & Zijlstra 1998, Vervaeke et al. 2004

Guzmania° (= *Tillandsia*) × *Goudaea* **IT** Tillandsieae × Vriesieae (→ × *Guzgaudaea*) BSI 2025

Guzmania° (= *Tillandsia*) × *Lutheria* **IT** Tillandsieae × Vriesieae (→ × *Guzlutheria*) BSI 2025

Guzmania° (= *Tillandsia*) × *Vriesea* **IT** Tillandsieae × Vriesieae (→ × *Guzvriesea* A. D. Hawkes 1959 in Bromel. Pap. 1 (5), 45; Dutrie ex M. B. Foster 1963 in Bromeliad Soc. Bull. 13, 85) IK 1981, Neuhaus 1995, Grant & Zijlstra 1998, IPNI 2011

Lutheria × *Tillandsia* Vriesieae × Tillandsieae (→ × *Luthandsia*) BSI 2025

Lutheria × *Vriesea* Vriesieae (→ × *Vrieslutheria* Lawn ex M. H. J. van der Meer 2019), POWO 2025

Racinaea° (= *Tillandsia*) × *Tillandsia* **IS** Tillandsieae (→ × *Racindsia* Takiz. 2009 J. Bromeliad Soc. 59 (3): 116) **IS** IPNI 2011

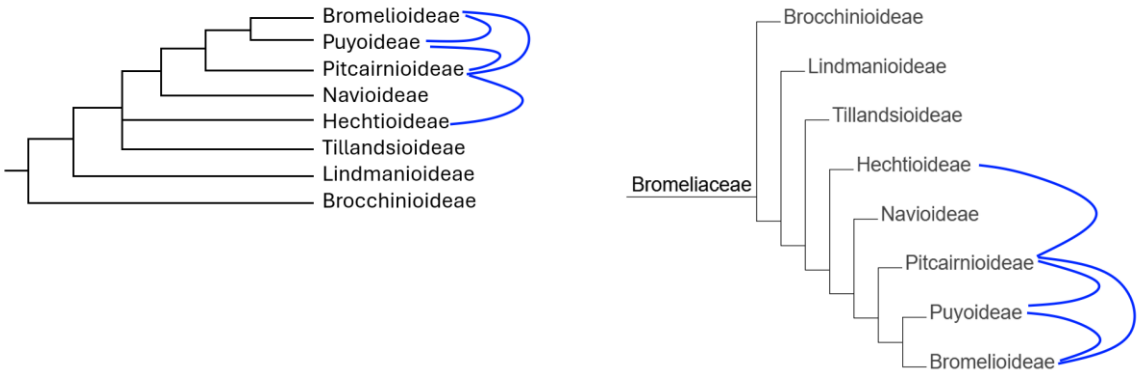
Stigmatodon × *Tillandsia* Vriesieae × Tillandsieae (→ × *Tillamatodon*) BSI 2025

Stigmatodon × *Vriesea* Vriesieae (→ × *Vriesmatodon*) BSI 2025

Tillandsia × *Vriesea* **IT** Tillandsieae × Vriesieae (→ × *Vrieslandsia* C. Chevalier 1931 in Bull. Soc. Natl. Hort. France V, 4, 213–215) Neuhaus 1995, Grant & Zijlstra 1998, Vervaeke et al. 2004

Vriesea × *Werauhia* Vriesieae (→ × *Vrierauhia* D. Shiigi ex D. A. Beadle 1998 Bromeliad Cult. Reg. 363) Butcher 2005

Wallisia° (= *Tillandsia*) × *Tillandsia* **IS** Tillandsieae (→ × *Wallandsia* Lawn ex M. H. J. van der Meer 2019), POWO 2025



Bromeliaceae: hybrid connections between the subfamilies in: 1. (left) the phylogeny of Givnish et al. (2011. https://doi.org/10.3732/ajb.1000059; own depiction) and 2. (right) the phylogeny of Givnish et al. (2004. https://doi.org/10.1086%2F421067), from en.wikipedia (2025, CC BY SA 4.0).

References:

Baensch U & Baensch U (1994) Blühende Bromelien. Nassau/Bahamas: Tropic Beauty Publishers.

Baskerville E (1994) Cultivar / Grex Registrations for 1991 June 1994. J. Bromeliad Society 5 (44), 214–219.

Beadle DA (1991) A preliminary listing of all known cultivar and grex names for the Bromeliaceae. Los Angeles: Bromeliad Society Inc.

Benzing DH (2000) Bromeliaceae: Profile of an Adaptive Radiation. Cambridge Univ. Press, Cambridge, U. K.

Bromeliad Society International. **BSI.** https://bsi.org/registry/

Butcher D (2002) Cultivar Corner – Two oddities from Oz and one from Florida. J. Bromeliad Soc. 52, 51–53. e.g. photo of *Deuterocohnia* × *Pitcairnia*

Butcher D (2005, 2008) Cultivar Corner Nothogenera or Bi-Generics. J. Bromeliad Soc. 52, 51

Butcher D & Gouda EJ (cont. updated) Bromeliad putative natural hybrid list. University Botanic Gardens, Utrecht (accessed: 11-03-2019). http://bromeliad.nl/hybridList/

Crayn DM et al. (2004) Multiple origins of crassulacean acid metabolism and the epiphytic habit in the Neotropical family Bromeliaceae. PNAS 101, 3703–3708. http://www.pnas.org/cgi/content/abstract/0400366101v1

de Souza EH et al. (2017) Interspecific and intergeneric hybridization in Bromeliaceae and their relationships to breeding systems. Sci. Hort. 223, 53–61.

Givnish TJ et al. (2011) Phylogeny, adaptive radiation, and historical biogeography in Bromeliaceae: Insights from an eight-locus plastid phylogeny. Amer. J. Bot. 98, 872–895. https://doi.org/10.3732/ajb.1000059

Givnish TJ et al. (2014) Adaptive radiation, correlated and contingent evolution, and net species diversification in Bromeliaceae. Mol. Phyl. Evol. 71, 55–78. https://doi.org/10.1016/j.ympev.2013.10.010

Grant JR & Zijlstra G (1998) An annotated catalogue of the generic names of the Bromeliaceae. Selbyana 19 (1), 91–121. http://www.fcbs.org. „Classification/Taxonomy"; part IV of the article lists all intergeneric hybrids up to 1998. – Addenda in 2025: "Another

world – the diverse bigenerics" by Geoff Lawn.
Horres R et al. (2000) Molecular phylogenetics of Bromeliaceae: evidence from trnL(UAA) intron sequences of the chloroplast genome. Plant Biol. 2: 306–315.
Kessous IM et al. (2025) New insights into the classification, diversification, and evolutionary dynamics of bromeliads. Botanical Journal of the Linnean Society 208, 242–255, https://doi.org/10.1093/botlinnean/boae074 this article is of general interest for basic type studies, because it has the focus on diversification processes
Loiseau et al. (2021) Genome Skimming Reveals Widespread Hybridization in a Neotropical Flowering Plant Radiation Front. Ecol. Evol., 28 May 2021 Sec. Biogeography and Macroecology Volume 9. https://doi.org/10.3389/fevo.2021.668281 Tillandsioideae
Neuhaus K (1995) Die Familie der Bromeliaceen, ein oder mehrere Grundtypen? Stud. Integrale J. 2, 15–19. (= The Bromeliaceae family: one or several basic types?)
Parton E et al. (2001) Interspecific and intergeneric fertilization barriers in Bromeliaceae. Acta Horticulturae 552, 43–54. see also http://www.kluweronline.com/issn/0014-2336/current
Souza de EH et al. (2017) Interspecific and intergeneric hybridization in Bromeliaceae and their relationships to breeding systems. Scientia Horticulturae 223, 53–61.
van der Meer MHJ (2019) Valid publication of 22 nothogenera and two new combinations in Bromeliaceae. Cactologia Phantastica 7 (2). https://zenodo.org/records/3385667
Vervaeke I et al. (2004) Morphology of artificial hybrids of *Vriesea splendens* × *Tillandsia cyanea* and *V. splendens* × *Guzmania lingulata* (Bromeliaceae). Ann. Bot. Fennici 41, 201–208.

Butomaceae (Alismatales) 1: 1

flowering rush family = Schwanenblumengewächse

The order Alismatales has 14 families.

Butomus umbellatus.

Probably **basic type family Butomaceae** (1: 1) as a well-defined monotypic family.

Cactaceae (Caryophyllales) 139: 1900

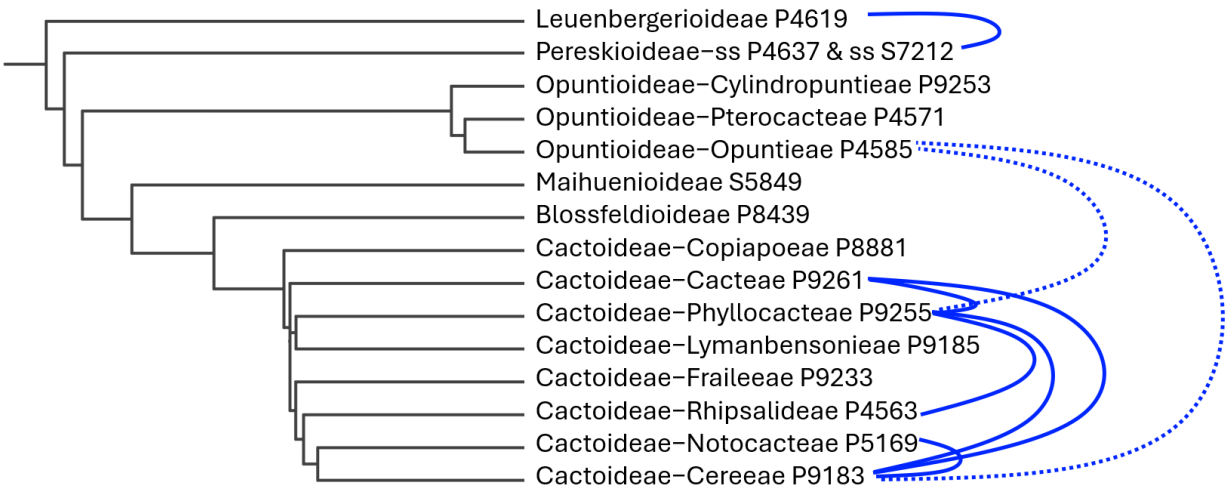
cactus family =Kakteengewächse

AP website 2025: 5 subfamilies.

Subdivision of subfamily according to Vos et al. 2025, which differs much from AP website 11.1025.

de Vos et al. separate tribe Blossfeldieae as an own subfamily Blossfeldioideae, and propose to reunite subfamilies Leuchtenbergerioideae and Pereskioideae as one subfamily Pereskioideae.

Cactoideae 112: 1500 (incl. Blossfeldioideae).
Leuenbergerioideae *Leuenbergeria* 1: 8 (no stem stomata).
Maihuenioideae *Maihuenia* 1: 2.
Opuntioideae 15: 220–349 (stems articulated).
Pereskioideae 1: 9 *Pereskia.*



Cactaceae: hybrid connections between subfamilies and tribes in the (simplified) phylogeny of de Vos et al. 2025 (BUCKY analyses. https://doi.org/10.1007/s00606-025-01948-z; cf. de Vos et al.)

Cactoideae 112: 1500. **120 IG** (incl. 26 plurigeneric hybrids) **+ 30 IT**

9 tribes:

Blossfeldieae 1: 1.

Cacteae 30 *Astrophytum, Echinocactus, Ferocactus, Leuchtenbergia, Lophophora, Mammilaria, Stenocactus, …*

Cereeae 35: 445 *Borzicactus, Cereus, Cleistocactus, Denmoza, Echinopsis, Espostoa, Gymnocalycium, Rebutia, …*

Copiapoeae 1 *Capiapoa.*

Fraileeae 1: 18 *Frailea.*

Lymanbensonieae 2 *Calymmanthium, Lymanbensonia.*

Notocacteae 4 *Eriosyce 73, Neowerdermannia, Parodia 62, Yavia.*

Phyllocacteae 36 *Acanthocereus, Aporocactus, Disocactus, Cephalocereus, Epiphyllum, Hylocereus, Leptocereus*, Nyctocereus, *Pachycereus, Selenicereus, …*

Rhipsalideae 4: 55 *Hatiora, Lepismium, Rhipsalis 37, Schlumbergera.*

Basic type Cactaceae subfamily Cactoideae (112: 1500): Kutzelnigg 2009 unpubl. About 150 bigeneric and plurigeneric hybrids are known, most of them artificial, 30 of them connecting all important tribes (5 of 9), see the figure on top (see: Cactaceae). An exception is the monotypic tribe Blossfeldieae which is separated as an own tribe by de Vos et al. 2025. – The circumscription of genera and tribes has been changed fundamentally in the last decades, but this is not relevant for the basic type question. – Two connections have been reported to subfamily Opuntioideae, but further confirmation is necessary.
Possibly, Cactaceae as a whole represent a basic type. But this is speculative currently.

Acanthocalycium × *Cylindrolobivia*° (= *Echinopsis* p. p.) Cereeae (→ × *Cylindrocalycium* Y. Ito 1981, The Cactaceae, 644) IK 1987

Acanthocalycium × *Echinopsis* Cereeae (→ × *Acanthinopsis* P. V. Heath 1992 in Calyx 1, 94) IK 1996

Akersia° (= *Cleistocactus*) × *Borzicactus* Cereeae (→ × *Borkersia* Halda, Malina & Panar. 2003 in Acta Mus. Richnov., Sect. Nat. 10 (2): 150) IPNI 2008

Aporocactus × *Cryptocereus*° (= *Selenicereus* p. p.) Phyllocacteae (→ × *Aporocryptocereus* Xhonneux 2000 in Cact. Aventures 45: 24) IPNI 2008

Aporocactus × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Aporoheliocereus* hort. ex Airy Shaw 1966 in Willis, Dict. Flow. Pl. Ferns, ed. 7: 80) IPNI 2008

Aporocactus × *Cryptocereus*° (= *Selenicereus* p. p.) × *Epiphyllum* × *Heliocereus*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Kleinerara* P. V. Heath 1992 in Calyx 1, 86) (pentageneric) IK 1996

Aporocactus × *Cryptocereus*° (= *Selenicereus* p. p.) × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Meierara* P. V. Heath 1983 in Epiphytes 7, 91) (tetrageneric) IK 1987

Aporocactus × *Disocactus* Phyllocacteae Backeberg 1958–1962, Knobloch 1972

Aporocactus × *Echinopsis* **IT** Phyllocacteae × Cereeae (→ × *Aporechinopsis* G. D. Rowley 1980 Name that Succulent, 114 = „× *Echinaporus*" Y. Ito 1981 The Cactaceae, 649, invalid according to Art. H.6.2.) IK 1987

Aporocactus × *Epiphyllum* Phyllocacteae (→ × *Aporoepiphyllum* G. D. Rowley 1980 Name that Succulent, 114; = „× *Aporophyllum*" hort. ex D. R. Hunt 1966 in Willis Dict. Fl. Pl. ed. 7, 80, not correct according to Art. H. 6 of the code) Knobloch 1972, IK 1987

Aporocactus × *Epiphyllum* × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Joyceara* P. V. Heath 1992 in Calyx 1, 84) (tetrageneric) IK 1996

Aporocactus × *Epiphyllum* × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Cockeara* P. V. Heath 1992 in Calyx 1, 84) (tetrageneric) IK 1996

Aporocactus × *Epiphyllum* × *Heliocereus*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Rettigara* P. V. Heath 1992 in Calyx 1, 96) (tetrageneric) IK 1996

Aporocactus × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ „× *Heliaporus*" Rowley 1951 in Cact. & Succ. Journ. Brit. 13, 54, in adnot.; et 1962 in Backeberg Cactac.: Handb. Kakteenk. 6, 3553; confer × *Aporoheliocereus mallisonii* (Otto et Dietrich) P. V. Heath 1989 in Taxon 38, 281: *Cereus smithii*; × *Aporoheliocereus smithianus* (Sweet) P. V. Heath 1983 in Epiphytes 7, 92: *Cereus smithianus*) Backeberg 1958–1962, IK 1970, Knobloch 1972, IK 1991

Aporocactus × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Aporoheliochia* P. V. Heath 1984 in Epiphytes, 8, 40) IK 1991

Aporocactus × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Aporochia* G. D. Rowley 1972 in Epiphytes 4, 12 cf. G. D. Rowley 1980 publ. 1982 in Repert. Pl. Succ. (I.O.S.) 31, 3) Backeberg 1958–1962, IK 1987

Aporocactus × *Schlumbergera* **IT** Phyllocacteae × Rhipsalideae (→ × *Aporgera* van der Meer 2018) POWO 2025

Aporocactus × *Selenicereus* Phyllocacteae (→× *Aporicereus* 2016 Mottram) cf. G. D. Rowley 1980 publ. 1982 in Repert. Pl. Succ. (I.O.S.) 31, 11) Backeberg 1958–1962, IK 1987, POWO 2025

Aporocactus × *Trichocereus*° (= Echinopsis p. p.) **IT** Phyllocacteae × Cereeae (= *Echinopsis* p. p.) Backeberg 1958–1962, Knobloch 1972

Aporocactus × *Weberocereus* Phyllocacteae (→ × *Aporoberocereus* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 46) IK 1987

Arequipa° (= *Oreocereus* p. p.) × *Heliocereus* × *Nopalxochia*° (= *Disocactus* p. p.) (→ × *Callisonara* P. V. Heath 1992 in Calyx 1: 98) (trigeneric) IK 1996

Ariocarpus × *Lophophora* Cacteae (nat. hyb. Mexico) http://www.panarottocactus.net/phpBB2/viewtopic.php?t=69 2007 (with photo)

Arthrocereus × *Cleistocactus* Cereeae (→ × *Arthrocleistocactus* Mordhorst 2020) POWO 2025

Astrophytum × *Ferocactus* Cacteae (→ × *Astroferocactus* Liczn. 2009 Kaktusy Inne 6 (3): 1001; cf. Repert. Pl. Succ. 60: 6 (2010)) IPNI 2013

Astrophytum × *Leuchtenbergia* Cacteae (→ × *Astrobergia* Pinal 2010 Revista Circulo Colecc. Cact. Crasas Republ. Argent. 9 (1): 25; cf. Repert. Pl. Succ. 61: 9 (2011)) IPNI 2013

Backebergia (= *Pachycereus* p. p.) × *Pachycereus* **IS** Phyllocacteae (→ × *Pachebergia* S. Arias & Terrazas 2008 in Revista Mex. Biodivers. 79 (1): 26) (nat. hyb. Mexico) Arias & Tarrazas 2008, IPNI 2009

Bergerocactus × *Myrtillocactus* Phyllocacteae (→ × *Myrtgerocactus* Moran 1962 in Cact. & Succ. Journ. Amer. 34, 186) Backeberg 1958–1962, IK 1970, Knobloch 1972, POWO 2024 (nat. hyb. Mexico)

Bergerocactus × *Pachycereus* Phyllocacteae (→ × *Pacherocactus* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 78; = „× *Pachgerocereus*“ Moran 1962 in Cact. & Succ. Journ. Amer. 34, 93) Backeberg 1958–1962, IK 1970, Knobloch 1972, IK 1987, POWO 2024 (nat. hyb. Mexico)

Bisnaga° (= *Ferocactus* p. p.) × *Stenocactus* **IT** Phyllocacteae × Cacteae (→ × *Stenobisnaga* Doweld 2005 in Sukkulenty (Moscow) 8 (1–2): 16) IPNI 2008

Borzicactus × *Chamaecereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Chamaezicactus* Halda, Malina & Panar. 2003 in Acta Mus. Richnov., Sect. Nat. 10 (2): 151) IPNI 2008

Borzicactus × *Cleistocactus* Cereeae (→ × *Cleistoborzicactus* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 48) IK 1987

Borzicactus × *Denmoza* Cereeae (→ × *Borzimoza* G. D. Rowley 1980, Name that Succulent, 116) IK 1987

Borzicactus × *Echinopsis* Cereeae (→ × *Borzinopsis* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 47) IK 1987

Borzicactus × *Espostoa* Cereeae (→ × *Borzipostoa* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 47; = × *Espostocactus* Mott 1990) IK 1987

Borzicactus × *Matucana* Cereeae POWO 2024 (nat. hyb. Peru)

Borzicactus × *Oroya* Cereeae (→ × *Borziroya* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 47) IK 1987

Browningia × *Espostoa* Cereeae (→ × *Espostingia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 48) IK 1987

Cephalocereus × *Epiphyllum* Phyllocacteae (→ × *Cephalepiphyllum* R. Mottram 1990, Contrib. New Class. Cact. Fam., 26) IK 1991

Cephalocereus × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Cephaliocereus* G. D. Rowley 1980 Name that Succulent, 118) IK 1987

Cephalocereus × *Neobuxbaumia*° (= *Cephalocereus*) **IS** Phyllocacteae Vite et al. 1996 (nat. hyb.)

Cephalocereus × *Nyctocereus*° (= *Peniocereus*) **IS** Phyllocacteae (→ × *Nyctocephalocereus* R. Mottram 1990, Contrib. New Class. Cact. Fam., 62) IK 1991

Cereus × *Epiphyllum* **IT** Cereeae × Phyllocacteae (→ × *Cerephyllum* R. Mottram 1990, Contr. New Class. Cact. Fam., 26) IK 1991

Cereus × *Echinopsis* Cereeae (→ × *Cereopsis* Mottram) Mottram 2016

Cereus × *Harrisia* Cereeae (→ × *Harricereus* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 76) IK 1987

Cereus × *Monvillea*° (= *Acanthocereus*) **IT** Cereeae × Phyllocacteae (→ × *Cerevillea* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 48) IK 1987

Chamaecereus° (= *Echinopsis* p. p.) × *Cleistocactus* Cereeae (→ × *Cleistochamaecereus* P. V. Heath 1992 in Calyx 1, 103) IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Echinopsis* **IS** Cereeae (→ × *Chamaelopsis* J. H. Johnson ex Y. Ito 1967 Hana Shaboten Zufu 59) IPNI 2013

Chamaecereus° (= *Echinopsis* p. p.) × *Lobivia*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Chamaebivia* Halda, Malina & Panar. 2003 in Acta Mus. Richnov., Sect. Nat. 10 (2): 151) IPNI 2008

Chamaecereus° (= *Echinopsis* p. p.) × *Echinocereus* × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Fricara* P. V. Heath 1992 in Calyx 1, 103) (trigeneric) IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Echinopsis* IS Cereeae (→ × *Chamaecereopsis* P. V. Heath 1992 in Calyx 1, 103) Backeberg 1958–1962, IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Echinopsis* × *Lobivia*° × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Mottramara* P. V. Heath 1992 in Calyx 1, 103) (tetrageneric) IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Echinopsis* × *Rebutia* (→ × *Timmermansara* P. V. Heath 1992 in Calyx 1, 104) (trigeneric) IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Leptocladodia* (= *Mamillaria* p. p.) **IT** Cereeae × Cacteae (→ × *Chamaecladodia* P. V. Heath 1992 in Calyx 1, 104) IK 1996

Chamaecereus° (= *Echinopsis* p. p.) × *Lobivia*° (= *Echinopsis* p. p.) **IS** Cereeae Backeberg 1958–1962

Chamaecereus° (= *Echinopsis* p. p.) × *Notocactus*° (= *Parodia* p. p.) **IT** Cereeae × Notocacteae (→ × *Chamaecactus* P. V. Heath 1992 in Calyx 1, 104) IK 1996

Chamaecereus° × *Pygmaeocereus* Cereeae (→ × *Chamygmaeocereus* Mordhorst 2008 Hybriden-J. 2007 (3): 11; cf. Repert. Pl. Succ. 58: 9) IPNI 2009

Cleistocactus × *Denmoza* Cereeae (→ × *Cleistoza* G. D. Rowley 2004 in Brit. Cact. Succ. J. 22 (2): 64) IPNI 2008

Cleistocactus × *Echinocereus* **IT** Cereeae × Phyllocacteae (→ × *Cleistonocereus* G. D. Rowley 2004 in Brit. Cact. Succ. J. 22 (2): 65) IPNI 2008

Cleistocactus × *Echinopsis* Cereeae (→ × *Cleistopsis* F. Strigl 1979 in Kakt. andere Sukk. 30, 226) IK 1991

Cleistocactus × *Echinopsis* × *Haageocereus* Cereeae (→ × Graeserara Mordhorst 2011 Kakteen And. Sukk. 62 (9): 228) (trigeneric) IPNI 2013

Cleistocactus × *Echinopsis* × *Matucana* Cereeae (→ × *Cleistoechinocana* Liczn. 2009 Kaktusy Inne 6 (3): 101; cf. Repert. Pl. Succ. 60: 6); = ×°*Schickara* Mordhorst 2011 Kakteen And. Sukk. 62 (9): 228 (trigeneric) IPNI 2013

Cleistocactus × *Espostoa* Cereeae (→ × *Espostocactus* R. Mottram 1990, Contrib. New Class. Cact. Fam., 38) IK 1991

Cleistocactus × *Haageocereus* Cereeae (→ × *Cleistaageocereus* Mordhorst 2011 Kakteen And. Sukk. 62 (9): 228) IPNI 2011, see also *Cleistocactus* × *Yungasocereus*° (= *Haageocereus* p. p.)

Cleistocactus × *Matucana* Cereeae (→ × *Cleistocana* G. D. Rowley 1994 in Bradleya 12, 5) IK 1996
Cleistocactus × *Parodia* **IT** Cereeae × Notocacteae (→ × *Cleistoparodia* A. Wessner 1994 in Hybriden-J. 1, 18, publ. 1995 Repert. Pl. Succ. (I. O. S.) 45, 8) IK 1996
Cleistocactus × *Samaipaticereus* Cereeae (→ × *Cleipaticereus* G. D. Rowley 1994 in Bradleya 12, 5) IK 1996
Cleistocactus × *Yungasocereus*° (= *Haageocereus* p. p.) Cereeae (→ × *Yungastocactus* G. D. Rowley 2004 in Brit. Cact. Succ. J. 22 (2): 64) IPNI 2008
Coleocephalocereus × *Pilosocereus* Cereeae (→ × *Colosocereus* G. D. Rowley 1994 in Bradleya 12, 6) IK 1996
Coleocephalocereus × *Pseudopilocereus*° (= *Pilosocereus*) Cereeae (→ × *Pseudocereus* P. V. Heath 1992 in Calyx 1, 106) IK 1996
Coleocephalocereus × *Stephanocereus* Cereeae (→ × *Coleocereus* P. V. Heath 1992 in Calyx 1, 106) IK 1996
Cosmantha° (= *Echinopsis* p. p.) × *Cylindrolobivia* (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Cylindrantha* Y. Ito 1981, The Cactaceae, 643) IK 1987
Cosmantha° (= *Echinopsis* p. p.) × *Echinopsis* **IS** Cereeae (→ × *Cosmopsis* Y. Ito 1981, The Cactaceae, 641) IK 1987
Cosmantha° (= *Echinopsis* p. p.) × *Soehrensia*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Soehrenantha* Y. Ito 1981, The Cactaceae, 646) IK 1987
Cryptocereus° (= *Selenicereus* p. p.) × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Heptocereus* P. V. Heath 1983 in Epiphytes 7, 91) IK 1987
Cryptocereus° (= *Selenicereus* p. p.) × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Petersenara* P. V. Heath 1992 in Calyx 1, 86) (trigeneric) IK 1996
Cylindrolobivia° (= *Echinopsis* p. p.) × *Echinopsis* **IS** Cereeae (→ × *Cylindropsis* Y. Ito 1981, The Cactaceae, 639; = „× *Echinocylindra*“ Y. Ito 1981, The Cactaceae, 644, invalid according to Art. H.6.2.) IK 1987
Cylindrolobivia° (= *Echinopsis* p. p.) × *Soehrensia*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Cylindrosia* 1976 Y. Ito in Shaboten 91, 25; cf. G. D. Rowley 1976 publ. 1979 in Repert. Pl. Succ. (I.O.S.) 27, 4; 1981 Y. Ito, The Cactaceae, 643) IK 1987
Denmoza × *Echinopsis* Cereeae (→ × *Echinomoza* G. D. Rowley 2004 in Brit. Cact. Succ. J. 22 (2): 64) IPNI 2008
Denmoza × *Leucostele* Cereeae (→ × *Leucomoza* M. H. J. van der Meer 2021) POWO 2024 (nat. hyb. Argentina)
Denmoza × *Seticereus*° (= *Cleistocactus* p. p.) Cereeae (→ × *Setidenmoza* 1959 C. Backeberg, Die Cactaceae 2: 991) Knobloch 1972, IK 1991
Denmoza × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Trichomoza* Font & Picca 2001 in Bradleya 19: 59) IPNI 2008
Disisorhipsalis° (= *Disocactus* p. p.) × *Disocactus* **IS** Cereeae (→ × *Disisocactus* Doweld 2001 in Sukkulenty (Moscow) 4 (1–2): 40 (publ. 2002)) IPNI 2008
Disisorhipsalis° (= *Disocactus* p. p.) × *Heliocereus*° (= *Disocactus* p. p.) **IS** Cereeae (→ × *Heliorhipsalis* Doweld 2001 (publ. 2002) in Sukkulenty (Moscow) 4 (1–2): 40) IPNI 2002
Disocactus × *Echinopsis* Cereeae (→ × *Disonopsis* G. D. Rowley 2004 in Syst. Init. 18: 13.) IPNI 2008, POWO 2025 (unplaced)

Disocactus × *Epiphyllum* **IT** Cereeae × Phyllocacteae (→ × *Disophyllum* C. F. Innes 1968 in Epiphytes 1, 43) IK 1991

Disocactus × *Heliocereus*° (= *Disocactus* p. p.) **IS** Cereeae Hunt 1992

Disocactus × *Heliocereus*° (= *Disocactus* p. p.) × Nopalxochia° (= *Disocactus* p. p.) Cereeae (→ × *Macdougallara* P. V. Heath 1992 in Calyx 1, 43) (trigeneric) IK 1996

Disocactus × *Hylocereus* **IT** Cereeae × Phyllocacteae (→ × °*Disolocereus* E. Meier 2009 EPIG 64: 26; cf. Repert. Pl. Succ. 60: 6) IPNI 2013

Disocactus × *Nopalxochia*° (= *Disocactus* p. p.) **IS** Cereeae (→ × *Disochia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 48) IK 1987

Disocactus × *Opuntia* **ISF** Cactoideae Cereeae × Opuntioideae Opuntieae → see Opuntioideae

Disocactus × *Opuntia* × *Selenicereus* **ISF** Cactoideae Phyllocacteae × Opuntioideae Opuntieae → see Opuntioideae

Disocactus × *Schlumbergera* **IT** Cereeae × Rhipsalideae (→ × *Schlumisocactus* Süpplie ex Doweld 2001 in Sukkulenty (Moscow) 4(1–2): 37 (publ. 2002).) IPNI 2008

Disocactus × *Selenicereus* **IT** Cereeae × Phyllocacteae (→ × *Disoselenicereus* E. Meier 1990 in Kakt. and. Sukk. 41, 80) Backeberg 1958–1962, Knobloch 1972, IK 1991

Disocactus × *Weberocereus* **IT** Cereeae × Phyllocacteae (→ × *Disberocereus* E. Meier 1990 in Kakt. and. Sukk. 41, 80) IK 1991

Echinocactus × *Ferocactus* Cacteae (→ × *Echinoferocactus* P. V. Heath 1992 in Calyx 1, 109) IK 1996

Echinocereus × *Sclerocactus* **IT** Phyllocacteae × Cacteae (→ × *Sclerinocereus* G. D. Rowley 2006 in Teratopia 280.) IPNI 2008

Echinocereus × *Echinopsis* **IT** Phyllocacteae × Cereeae (→ × *Echinocereopsis* P. V. Heath 1992 in Calyx 1, 109) IK 1996

Echinocereus × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Buchheimara* P. V. Heath 1992 in Calyx 1, 109) (trigeneric) IK 1996

Echinocereus × *Wilcoxia*° (= *Echinocereus* p. p.) Phyllocacteae (→ × *Echinocoxia* P. V. Heath 1992 in Calyx 1, 110) IK 1996

Echinofossulocactus° (= *Stenocactus* p. p.) × *Ferocactus* Cacteae (→ × *Ferofossulocactus* 1980 G. D. Rowley, Name that Succulent, 124) IK 1987

Echinofossulocactus° (= *Stenocactus*) × *Leuchtenbergia* Cacteae (→ × *Echinobergia* 1990 R. Mottram, Contr. New Class. Cact. Fam., 35) IK 1991

Echinopsis × *Epiphyllum* × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) × *Selenicereus* **IT** Cereeae × Phyllocacteae (→ × *Innesara* P. V. Heath 1992 in Calyx 1,609) (pentageneric) IK 1996

Echinopsis × *Epiphyllum* × *Selenicereus* **IT** Cereeae × Phyllocacteae (→ × *Knebelara* P. V. Heath 1992 in Calyx 1, 52) (trigeneric) IK 1996

Echinopsis × *Eriocereus*° (= *Harrisia* p. p.) Cereeae (→ × *Eriocereopsis* Doweld 2001 (publ. 2002) in Sukkulenty (Moscow) 4 (1–2): 34) IK

Echinopsis × *Gymnocalycium* Cereeae (→ × *Gymnochinopsis* P. V. Heath 1992 in Calyx 1, 111) IK 1996

Echinopsis × *Haageocereus* Cereeae (→ × *Echinaageocereus* Mordhorst 2011 Kakteen And. Sukk. 62 (9): 228) IPNI 2012

Echinopsis × *Harrisia* Cereeae (→ × *Harrisinopsis* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 77) IK 1987

Echinopsis × *Harrisia* × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Guillauminara* P. V. Heath 1992 in Calyx 1, 111) (trigeneric) IK 1996

Echinopsis × *Heliocereus*° (= *Disocactus* p. p.) **IT** Cereeae × Phyllocacteae (→ × *Heliocereopsis* P. V. Heath 1992 in Calyx 1, 111) IK 1996

Echinopsis × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) **IT** Cereeae × Phyllocacteae (→ × *Lutterlohara* P. V. Heath 1992 in Calyx 1, 111) (trigeneric) IK 1996

Echinopsis × *Lobivia*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Echinobivia* Rowley 1966 in Nat. Cact. & Succ. Journ. 21, 82) Backeberg 1958–1962, Knobloch 1972, IK 1974

Echinopsis × *Lobivia*° (= *Echinopsis* p. p.) × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Tricholobiviopsis* P. V. Heath 1992 in Calyx 1, 111) (trigeneric) IK 1996

Echinopsis × *Nopalxochia*° (= *Disocactus* p. p.) Cereeae (→ × *Echinopalxochia* P. V. Heath 1992 in Calyx 1, 112) IK 1996

Echinopsis × *Notocactus*° (= *Parodia* p. p.) **IT** Cereeae × Notocacteae (→ × *Echinonotocactus* P. V. Heath 1992 in Calyx 1, 112) IK 1996

Echinopsis × *Oreocereus* Cereeae (→ × *Oreonopsis* G. D. Rowley 1994 in Bradleya 12, 6) IK 1996, POWO 2024 (nat. hyb. Argentina)

Echinopsis × *Parodia* **IT** Cereeae × Notocacteae (→ × *Echinoparodia* 1990 R.Mottram, Contrib. New Class. Cact. Fam., 36) IK 1991

Echinopsis × *Rebutia* Cereeae (→ × *Echinobutia* P. V. Heath 1992 in Calyx 1, 112) IK 1996

Echinopsis × *Salpingolobivia*° (= *Echinopsis* p. p.) Cereeae (→ × *Salpingolobiopsis* Y. Ito 1967 Hana Shaboten Zufu 48) IPNI 2013

Echinopsis × *Selenicereus* **IT** Cereeae × Phyllocacteae (→ × *Seleniopsis* G. D. Rowley 2004 in Cactaceae Syst. Init. 18: 13) IPNI 2008

Echinopsis × *Trichocereus*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Trichoechinopsis* hort. 1959 ex Backeberg Cactac.: Handb. Kakteenk. 2, 1283; × *Trichopsis* 1981 Y. Ito, The Cactaceae, 638) IK 1970, IK 1987

Echinopsis × *Weingartia*° (= *Rebutia* p. p.) Cereeae (→ × *Weinganopsis* G. D. Rowley 1994 in Bradleya 12, 6) IK 1996

Epiphyllanthus° (= *Schlumbergera* p. p.) × *Schlumbergera* **IS** Rhipsalideae (→ × *Schlumbergeranthus* Doweld 2001 (publ. 2002) in Sukkulenty (Moscow) 4 (1–2): 37) IPNI 2008

Epiphyllopsis° (= *Hatiora* p. p.) × *Rhipsalidopsis*° (= *Hatiora* p. p.) **IS** Rhipsalideae (→ × *Rhipsaphyllopsis* Werderm. 1939 in Kakteenkunde 11, in obs.) IK 1947, Knobloch 1972

Epiphyllum × *Heliocereus*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Heliphyllum* Rowley 1962 in Backeberg Cactac.: Handb. Kakteenk. 6, 3555) IK 1970, Knobloch 1972

Epiphyllum × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Feastara* P. V. Heath 1992 in Calyx 1, 38) (trigeneric) IK 1996

Epiphyllum × *Heliocereus*° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Rowleyara* P. V. Heath 1992 in Calyx 1, 36) (tetrageneric) IK 1996

Epiphyllum × *Heliocereus*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Courantara* P. V. Heath 1992 in Calyx 1, 116; = × *Helioseleniphyllum* Doweld 2001 (publ. 2002) Sukkulenty 4 (1–2): 41) (trigeneric) IK 1996

Epiphyllum × *Hylocereus* Phyllocacteae (→ × *Hylophyllum* P. V. Heath 1992 in Calyx 1, 38) IK 1996

Epiphyllum × *Nopalxochia*° (= *Disocactus* p. p.) Phyllocacteae (→ × *Epixochia* Rowley 1962 in Backeb. Cactac.: Handb. Kakteenk. 6, 3556) Backeberg 1958–1962, IK 1970, Knobloch 1972

Epiphyllum × *Nopalxochia*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Seleniphylchia* F. Süpplie 1988 in Succulenta 67, 258) (trigeneric) IK 1991

Epiphyllum × *Schlumbergera* **IT** Phyllocacteae × Rhipsalideae (→ × *Schlumbephyllum* Süpplie ex Doweld 2001 (publ. 2002) in Sukkulenty (Moscow) 4 (1–2): 37) IPNI 2008

Epiphyllum × *Selenicereus* Phyllocacteae (→ × *Seleniphyllum* Rowley 1962 in Backeberg Cactac.: Handb. Kakteenk. 6, 3557) (*E. crenatum* × *S. grandiflorum*) Backeberg 1958–1962, IK 1970, Knobloch 1972, Heath 1989, Tel-Zur et al. 2012

Epiphyllum × *Selenicereus* × *Opuntia* **ISF** Cactoideae Phyllocacteae × Opuntioideae Opuntieae → see Opuntioideae

(*Epiphyllum* × *Selenicereus*) × *Opuntia* **ISF** Cactoideae Phyllocacteae × Opuntioideae Opuntieae → see Opuntioideae

Escontria × *Polaskia* Phyllocacteae (→ × *Polascontria* Y. Cruz & S. Vasquez 2017) Cruz-Zamora et al. 2017 (*E. chiotilla* × *P. chichipe*) POWO 2024 (nat. hyb. Mexico)

Espostoa × *Haageocereus* Cereeae (→ × *Haagespostoa* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 76) Ritter 1958 (see Rowley 1982), Rowley 1982, IK 1987, POWO 2024 (nat. hyb. Peru)

Espostoa × *Matucana* Cereeae (→ × *Espocana* P. V. Heath 1992 in Calyx 1, 117) IK 1996

Espostoa × *Weberbauerocereus* Cereeae (→ × *Weberbostoa* G. D. Rowley 1994 in Bradleya 12, 6) IK 1996

Ferocactus × *Leuchtenbergia* Cacteae (→ × *Ferobergia* Ono & Ito 1981 in The Cactaceae, 472; Glass 1966 in Cact. & Succ. Journ. Amer. 38, 177) Backeberg 1958–1962, IK 1974, IK 1987

Ferocactus × *Stenocactus* Cacteae (→× *Ferenocactus* Doweld 2005 in Sukkulenty (Moscow) 8 (1–2): 16.) IPNI 2008, see also *Echinofossulocactus*° (= *Stenocactus* p. p.) × *Ferocactus*

Griseocereus° (= *Stenocereus* p. p.) × *Isulatocereus*° (= *Stenocereus* p. p.) **IS** Phyllocacteae (→ × *Grisulatocereus* P. V. Heath 1998 in Calyx 6 (1): 1) IPNI 2008

Gymnocalycium × *Hylocereus* **IT** Cereeae × Phyllocacteae (→ × *Hylocalycium*) Hunt 1992

Gymnocalycium × *Lophophora* **IT** Cereeae × Cacteae (→ × *Gymnophora* P. V. Heath 1992 in Calyx 1, 118) IK 1996

Gymnocalycium × *Rebutia* Cereeae (→ × *Gymnobutia* P. V. Heath 1992 in Calyx 1, 118) IK 1996

Gymnocalycium × *Sulcorebutia*° (= *Rebutia* p. p.) Cereeae (→ × *Sulcocalycium* P. V. Heath 1992 in Calyx 1, 118) IK 1996

Gymnocalycium × *Weingartia*° (= *Rebutia* p. p.) Cereeae (→ × *Weinocalycium* P. V. Heath 1992 in Calyx 1, 119) IK 1996

Harrisia × *Selenicereus* **IT** Cereeae × Phyllocacteae (→ × *Selenirisia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 79) IK 1987

Hatiora × *Schlumbergera* Rhipsalideae (→ × *Hatbergera* Süpplie 2004 in Schlumbergera Direct. Spec. Hybr. [4].) Boyle & Idnurm 2003, IPNI 2008

Heliocereus° (= *Disocactus* p. p.) × *Mediocactus* (= *Selenicereus* p.p) Phyllocacteae (→ × *Medeliocereus* P. V. Heath 1992 in Calyx 1, 120) IK 1996

Heliocereus° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) **IS** Phyllocacteae (→ × *Heliochia* Rowley 1962 in Backeberg Cactac.: Handb. Kakteenk. vi, 3551; the first hybrid of this nothogenus was published as *'Cactus hybridus'* by Geel in Sertum Botanicum 1, t. 115) Backeberg 1958–1962, IK 1970, Knobloch 1972, IK 1991, IK 1996

Heliocereus° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) × *Pfeiffera* Phyllocacteae (→ × *Eversonara* P. V. Heath 1992 in Calyx 1, 120) (trigeneric) IK 1996

Heliocereus° (= *Disocactus* p. p.) × *Nopalxochia*° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Worsleyara* P. V. Heath 1992 in Calyx 1, 120) IK 1996

Heliocereus° (= *Disocactus* p. p.) × *Phyllocactus*° (= *Epiphyllum* p. p.) Phyllocacteae (→× *Phyllocereus* Knebel 1938 in Cactuss. en Vetpl. iv, 26, hybr. artef.; = × *Heliocactus* Janse 1938 in Cactuss. en Vetpl. iv, 28) IK 1950

Heliocereus° (= *Disocactus* p. p.) × *Pilosocereus* **IT** Phyllocacteae × Cereeae (→ × *Heliosocereus* Glass & Foster 1971 in Cact. Succ. J. (U.S.A.) 43, 22, nom. provis.) Backeberg 1958–1962, IK 1981

Heliocereus° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→× *Seleliocereus* 1937 A. Guillaumin, Guides Coll. Pl. Viv. Mus. Nation. Hist. Nat. Paris 4, 51; = „× *Helioselenius*“ Rowley 1951 in Cact. & Succ. Journ. Brit. xiii, 54, in adnot.; et 1962 in Backeb. Cactac.: Handb. Kakteenk. vi, 3554), IK 1970, IK 1974, IK 1996

Hylocereus × *Selenicereus* Phyllocacteae Tel Zur et al. 2005, 2012

Leptocladodia° (= *Mamillaria* p. p.) × *Pseudomamillaria*° (= *Mamillaria* p. p.) **IS** Cacteae (→ × *Pseudocladodia* P. V. Heath 1992 in Calyx 1, 121) IK 1996

Leuchtenbergia × *Parrycactus*° (= *Ferocactus* p. p.) Cacteae (→ × *Parrybergia* Doweld 2005 in Sukkulenty (Moscow) 8 (1–2): 17) IPNI 2008

Leuchtenbergia × *Thelocactus* Cacteae (→ × *Thelobergia* Hirao 1979, Colour Encycl. Cacti, 30; cf. G. D. Rowley 1979 publ. 1981 in Repert. Pl. Succ. (I. O. S.) 30, 10) IK 1987

Leucostele × *Soehrensia*° (= *Echinopsis* p. p.) Cereeae (→ × *Leia* M. H. J. van der Meer 2022) POWO 2024

Lobivia° (= *Echinopsis* p. p.) × *Notocactus*° (= *Parodia* p. p.) **IT** Cereeae × Notocacteae (→ × *Notolobivia* P. V. Heath 1992 in Calyx 1, 122) IK 1996

Lobivia° (= *Echinopsis* p. p.) × *Oreocereus* Cereeae (→ × *Oreobivia* M. Lowry 2000 in Brit. Cact. Succ. J. 18 (4): 216) IPNI 2008

Lophophora × *Turbinicarpus* Cacteae (→ × *Turbiniphora* Halda & Malina 2005 in Acta Mus. Richnov., Sect. Nat. 12 (1): 7 (–8)) IPNI 2008

Matucana° (= *Oreocereus* p. p.) × *Oreocereus* Cereeae (→ × *Oreocana* P. V. Heath 1992 in Calyx 1, 123) IK 1996

Matucana° (= *Oreocereus* p. p.) × *Oroya* (= *Oreocereus* p. p.) Cereeae (→ × *Maturoya* P. V. Heath 1992 in Calyx 1, 123) IK 1996

Micranthocereus × *Pilosocereus* Cereeae (→ × *Microsocereus* G. D. Rowley 1994 in Bradleya 12, 6) IK 1996

Micranthocereus × *Pseudopilocereus*° (= *Pilosocereus* p. p.) Cereeae (→ × *Micropilocereus* P. V. Heath 1992 in Calyx 1, 123) IK 1996

Mitrocereus° (= *Pachycereus*) × *Pachycereus* **IS** Phyllocacteae (→ × *Patrocereus* M. H. J. van der Meer 2021) POWO 2024 (nat. hyb. Mexico)

Myrtillocactus × *Nyctocereus* (= *Peniocereus*) Phyllocacteae (→ × *Myrtocereus* 1990 R. Mottram, Contrib. New Class. Cact. Fam., 59) IK 1991~

Myrtillocactus × *Rathbunia*° (= *Stenocereus* p. p.) Phyllocacteae (→ × *Rathbunillocactus* R. Mottram 1990, Contrib. New Class. Cact. Fam., 73; P. V. Heath 1992 in Calyx 2, 106) IK 1991, IK 1996

Myrtillocactus × *Stenocereus* Phyllocacteae (→ × *Myrtillenocereus* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 78; = × *Stenillocactus* P. V. Heath 1996 in Calyx 5(3): 102) IK 1987, IPNI 2008

Nigellicereus° (= *Stenocereus* p. p.) × *Ritterocereus*° (= *Stenocereus* p. p.) **IS** Phyllocacteae (→ × *Rittellicereus* P. V. Heath 1998 in Calyx 6 (1): 1) IPNI 2008

Nopalxochia° (= *Disocactus* p. p.) × *Rhipsalis* **IT** Phyllocacteae × Rhipsalideae (→ × *Nopalxalis* F. Süpplie 1988 in Succulenta 67, 141) IK 1991

Nopalxochia° (= *Disocactus* p. p.) × *Selenicereus* Phyllocacteae (→ × *Selenochia* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U.K.) 37, 79, as „× *Selenocha*“) IK 1987

Oreocereus × *Trichocereus*° (= *Echinopsis* p. p.) Cereeae (→ × *Oreotrichocereus* P. V. Heath 1992 in Calyx 1, 125) IK 1996

Salpingolobivia° (= *Echinopsis* p. p.) × *Soehrensia*° (= *Echinopsis* p. p.) **IS** Cereeae (→ × *Soehrenlobivia* 1981 Y. Ito, The Cactaceae, 650) IK 1987

Leuenbergerioideae 1: 8

Leuenbergeria 8.

de Vos et al. 2025 propose to include this subfamily in Pereskioideae.

For basic types and hybrids see Pereskioideae.

Maihuanioideae 1: 2

Maihuenia 2.

Opuntioideae 15: 220–350. **2 IG**

AP website 2025 3 tribes:

Cylindropuntieae 7: 79 *Cylindropuntia 40, Grusonia, Micropuntia, ...*

Opuntieae 7: >200 *Brasiliopuntia, Consolea 10, Opuntia 200* (incl. *Corynopuntia*°) (12 IS), *Tacinga 15, …*

Pterocacteae = Tephrocacteae 5: 33 *Austrocylindropuntia, Cumulopuntia, Maihueniopsis 15, Pterocactus, Tephrocactus.*

Consolea × *Opuntia* Opuntieae (→ × *Opulea* M. H. J. van der Meer 2019) POWO 2024 (nat. hyb. Caribbean)

Cylindropuntia × *Grusonia* Cylindropuntieae (→× *Cylindronia robertsii*) Baker 2023, POWO 2024 (nat. hyb. Mexico, *C. alcahes* × *G. invicta*)

Disocactus × *Opuntia* **ISF** Cactoideae Cereeae × Opuntioideae Opuntieae (→ × *Disuntia* M. H. J. van der Meer 2018 Cact. Phantast.) POWO 2025

Disocactus × *Opuntia* × *Selenicereus* **ISF** Cactoideae Cereeae × Opuntioideae Opuntieae (→ × *Opuntara* van der Meer 2018 Cact. Phantast. 1 (1): 6) POWO 2025

Epiphyllum × *Opuntia* **ISF** Cactoideae Phyllocacteae × Opuntioideae Opuntieae (→× *Epipuntia* Mottram 2016 Cactician 4, 112) → **questionable**: see next entry

Epiphyllum × *Selenicereus* × *Opuntia* **ISF** Cactoideae Phyllocacteae × Opuntioideae Opuntieae (→ × *Beahmara* P. V. Heath 1992 in Calyx 1, 68) Heath 1992, IK 1996, POWO 2025 (accepted). **questionable.** This hybrid is based on 'Pygmalion' in the ESA (Epiphyllum Society of America) Directory 1983, p. 118 and is according to Heath 1992 supposed to be the cross (*Epiphyllum* × *Selenicereus*) (= × *Epinicereus*) 'Cooperi'× *Opuntia* spec. × *Epipuntia* and × *Beahmara* are treated as synonyms by some authors, but the first is bigeneric, the second trigeneric.

Pereskioideae 1: 9. **2 IT/ISF**

Pereskia 9 (incl. *Rhodocactus*°).

de Vos et al. 2025 propose to include Leuenbergerioideae in Pereskioideae.

Subfamilies **Pereskioideae** (1: 9) and **Leuenbergerioideae** (1: 8) belong to the same basic type. But possibly they even belong to a more extensive basic type of the whole family (see Cactoideae)?

Leuenbergeria bleo × *Pereskia* (= *Rhodocactus*°) **ISF** Leuenbergerioideae × Pereskioideae (*L. bleo* × *P. grandifolia* Leuenberger 1986 Mem. New York Bot. Gard. 41, 50 (→ ×°*Rhodenbergeria* M. H. J. van der Meer 2022)

Leuenbergeria × *Pereskia* **ISF** Leuenbergerioideae × Pereskioideae (→ × *Perenbergeria* M. H. J. van der Meer 2022) (*L. bleo* × *P. diaz-romeroana* and *L. bleo* × *P. grandifolius* Leuenberger 1986, Mem. New York Bot. Gard. 41: 50)

Pereskia (= *Rhodocactus*°) × *Pereskia* **IS** Pereskioideae (→ × *Rhodeskia* M. H. J. van der Meer 2022) (*R. nemorosus* = *P. nemorosa* × *P. diaz-romeroana* Leuenberger1986 Mem. New York Bot. Gard. 41, 50)

References:

Backeberg C (1958–1962) Die Cactaceae. Handbuch der Kakteenkunde. 6 vols. Jena: G. Fischer.

Boyle TH & Idnurm A (2003) Intergeneric hybridization between *Schlumbergera* Lem. and *Hatiora* Britt. & Rose (Cactaceae). J. Amer. Soc. Hort. Sci. 128, 724–730.

Cullmann W, Götz E & Gröner G (1986) The encyclopedia of cacti. Sherborne: Alphabooks. With a classical diagram of crossings

de Vos et al. (2025) Phylogenomics and classification of Cactaceae based on hundreds of nuclear genes. Plant Syst. Evol. 311, 28. https://doi.org/10.1007/s00606-025-01948-z

de.wikipedia (2025). https://de.wikipedia.org/wiki/Liste_der_Kakteenhybridgattungen

Götz E & Gröner G (2000) Die Kakteen. 7. Aufl. Stuttgart: Ulmer.

Hawkes MW (1982) Hybridizations in the Cactaceae. Cact. Succ. J. Amer. 54, 223–225, 243–246; 55, 31–36.

Heath PV (1989) The saga of × *Seleniphyllum* (Cactaceae). Taxon 38, 148–150. https://www.jstor.org/stable/1220922

Heath PV (1992a) Errors in the ESA Directory. Calyx 1 (2), 25–89.

Heath PV (1992b) The nothogenera of the Cactaceae. Calyx 1 (3), 93–140.
Hunt DR & Taylor NP (1991) The genera of Cactaceae: progress towards consensus. Bradleya 8, 85–107.
Kutzelnigg H (2009, unpubl.) Neue Grundtypen bei Pflanzen. Kakteen: Cactaceae Cactoideae. Fachtagung Biologie der Studiengemeinschaft Wort und Wissen.
Mottram R (2016) Cactaceae Generitaxa. The Cactician 4, 1–357. https://www.crassulaceae.ch/docs/940b467dfd5453333fd8c33f7089ae91_Cactician%204%20HQ-1.pdf
Nyffeler R & Eggli U (2010a) A farewell to dated ideas and concepts – molecular phylogenetics and a revised suprageneric classification of the family Cactaceae. Schumannia 6, 109–149. [Biodivers. Ecol. 3.]
Nyffeler R & Eggli U (2010b) An up-to date familial and suprafamilial classification of succulent plants. Bradleya 28, 125–144.
Rowley GD (1962) Zur Genealogie der Phyllohybriden (Epicacti). p. 3545–3572 in Backeberg C (Hrsg.) Die Cactaceae. vol. 6. Jena: G. Fischer.
Rowley GD (1982) Intergeneric hybrids in succulents. Part 2. National Cactus and Succulent J. 37, 2–6, 45–49, 76–80.
Tel-Zur N et al. (2005) Cytogenetics of semi-fertile triploid and aneuploid intergeneric vine cacti hybrids. J. Heredity 96 (2), 124–131. http://aob.oxfordjournals.org/cgi/content/abstract/94/4/527 *Hylocereus* × *Selenicereus*; see also Tel-Zur et al. (2004).
Tel-Zur N et al. (2012) Intergeneric hybridization within the tribe Hylocereeae, subfamily Cactoideae (Cactaceae). Israel J. Plant Sciences 60 (3) Special Issue: SI, 325–334.
van der Meer MHJ (2019) 11 new nothogenera and 7 new combinations in Cactaceae. Cactologia Phantastica. https://doi.org/10.5281/ZENODO.2557879
van der Meer MHJ (2022) Three new nothogenera for hybrids between *Leuenbergeria*, *Pereskia* and *Rhodocactus* and a new combination in *Rhodocactus* (Cactaceae, Leuenbergerioideae, Pereskioideae). Cact. Phantast. 2022 (1)-2: 1. https://doi.org/10.5281/zenodo.6323287
Vite F et al. (1996) A natural hybrid population between *Neobuxbaumia tetetzo* and *Cephalocereus columna-trajani* (Cactaceae). J. Arid Environments 32, 395–405.

Calycanthaceae (Laurales) 5: 12. **1 IG**

sweetshrubs or spicebushes = Gewürzstrauchgewächse

2 subfamilies:

Calycanthoideae 3: 10.

Idiospermoideae 1: 1 *Idiospermum australiense* (Australia).

Calycanthoideae 3: 10

Calycanthus 3 (North America), *Chimonanthus 6* (China), *Sinocalycanthus* (China, by some authors included in *Calycanthus*).

IS: POWO (2026): *Calycanthus* IS)

Calycanthus floridus × *Sinocalycanthus* (= *Calycanthus*) *chinensis* (→ × *Sinocalycalycanthus* F. T. Lass. & Fantz 2001 HortScience 36 (4), 767) (*C. floridus* × *S. chinensis*) Lasseigne et al. 2001 (art. hyb.), IPNI 2008, POWO 2025

References:

Lasseigne FT et al. (2001) × *Sinocalycalycanthus raulstonii* (Calycanthaceae): A new intergeneric hybrid between *Sinocalycanthus chinensis* and *Calycanthus floridus*. HortScience 36, 765–767.

Campanulaceae (Asterales) 84: 2400. **2 IG**

bellflower family = Glockenblumengewächse

5 subfamilies (AP website 2025):
Nemacladoideae 2: 25.
Campanuloideae 50: 1050.
Cyphioideae 1: 65.
Cyphocarpoideae 1: 3.
Lobelioideae 29: 1200.

Campanuloideae 50: 1050

AP website: 3 tribes.

IS: IPNI 2013: 24 IS (*Campanula 11, Dialypetalum 1, Edraianthus 3, Phyteuma 4, Wahlenbergia 1*).

~~*Campanula* × *Phyteuma*~~ (→ „× *Fockeanthus*“ 1931 Wehrhahn, Gartenstauden 2, 985, in obs.) Kovanda 1981 (Unconfirmed. “probably belongs to the realm of fantasy … monstrosity of *P. hemisphaericum*.” … In 1931 Wehrhahn published the name ×°*Fockeanthus hausmanii* (Rchb. f.) Wehrh. for the same plant to mark it as an intergeneric hybrid), IK 1947, Knobloch 1972, Willis 1985, Feng et al. 2024 (×°*Phyteupanula* nothogen. nov. Feng et al. Phytoneuron 2024), POWO 2025 (accepted as ×°*Phyteupanula*).

Lobelioideae 29: 1200

Centropogon, *Lobelia*, *Siphocampylus*, …

IS: IPNI 2013: *Lobelia 4 IS.*

Centropogon × *Siphocampylus* **HY** (*C. cornutus* × *S. betulifolius* → *C.* × *lucyanus* W. Bull 1871, art. hyb.) Zander 2008 POWO 2025 (*Centropogon* IS).
Clermontia × *Cyanea* Givnish et al. 2013 **HY** (supposed hybridogeneous origin of *Clermontia*)

References:

Givnish TJ et al. (2013) Phylogeny, floral evolution, and inter-island dispersal in Hawaiian *Clermontia* (Campanulaceae) based on ISSR variation and plastid spacer sequences. PLOS ONE 8 (5) Article Number: e62566. doi: 10.1371/journal.pone.0062566
Kovanda M (1981) Studies in *Phyteuma*. Preslia 53, 211–238. http://www.preslia.cz/archive/Preslia_53_1981_211-238.pdf

Reichenbach HG (1877) Über einen merkwürdigen *Campanula*-Bastard aus Tirol. Flora 60, 30–31. http://www.botanicus.org/item/31753002307269. only one plant, which died. With diagnosis.

Cannabaceae (Rosales) 10: 117

hemp family = Hanfgewächse

Aphananthe, Cannabis 3, Celtis 74, Humulus, Lozanella, …

IS: PNI 2013: *Cannabis* 1 IS. POWO 2026: 0 IS. Many hybrids exist within *Cannabis*, but it is problematic to attribute them to species.

Caprifoliaceae (Dipsacales) 31: 890

honeysuckle family = Geißblattgewächse

AP website 2025: 7 subfamilies:
Caprifolioideae 5: 220.
Diervilloideae 2: 16.
Dipsacoideae 11: 290.
Linnaeoideae 6: 20.
Morinoideae 2–3: 13.
Valerianoideae 5: 375.
Zabelioideae 1: 4–6.

IS: IPNI 2013 (classical circumscription of Caprifoliaceae): *Abelia 2 IS, Diervilla 1 IS, Linnaea 1 IS, Lonicera 19 IS, Sambucus 1 IS, Triosteum 1 IS, Viburnum 7 IS, Weigela 3 IS.*

Diervilloideae 2: 16. **1 IG**

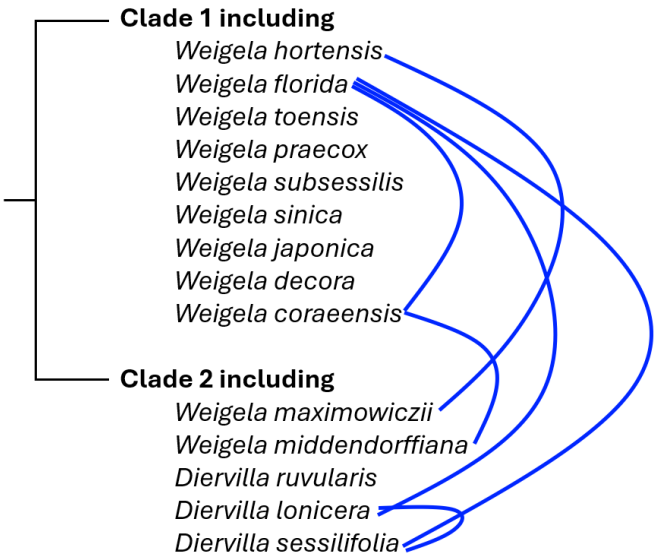
bush honeysuckle family = Weigelien-Verwandte

Diervilla 3, Weigela 13 (incl. *Weigelastrum° maximowiczii, Macrodiervilla° middendorfiana*).
The taxonomy is still matter of discussion, some authors accept only one genus *Weigela*, other authors up to 6 genera.

Basic type **Caprifoliaceae subfamily Diervilloideae** (2: 16): The 2 genera and the most distant species of the larger genus *Weigela* are connected by hybridization.

IS: POWO (2026) *Weigela 3 IS (coraensis × florida; coraensis × middendorfiana; decora × floribunda), Diervilla 1 IS (lonicera × sessilifolia).*
Yokoyama et al (2002) add *Weigela hortensis* × *W. maximowiczii*, nat. hyb.

Diervilla lonicera, sessiliflora × *Weigela florida* Diervilloideae Touchell et al. 2006 (art. hyb, **EC**, only a small part was successful).



Caprifoliaceae subfamily Diervilloideae: hybrid connections in the simplified phylogeny after Kim & Kim (1999, fig. 2. https://dx.doi.org/10.1007%2FPL00013887).

Dipsacoideae 11: 290

honeysuckle family = Kardengewächse

AP website 2026 two tribes:

Dipsaceae 10: 290 *Bassecoja 3, Callistemma, Cephalaria 102, Dipsacus 21, Knautia 60, Lomelosia 63, Pterocephalus 34, Pynocomon 2, Scabiosa 68, Succisa, Succisella.*

Triplostegieae: *Triplostegia* 1: 1.

en.wikipedia separates the following genera in an own subfamily Scabiosoideae (partly following Mayer & Ehrendorfer 2013. https://doi.org/10.1002/tax.621010): *Lomelosia, Pterocephalus, Pycnocomon, Scabiosa*.

IS: IPNI 28 IS (*Dipsacus 1, Knautia incl. Trichera° 17, Scabiosa incl. Lomelosia° 7*)

Knautia × *Succisa* Dipsaceae or Succiseae × Knautieae (→ × *Succisoknautia* Baksay 1952 in Ann. Mus. Nat. Hungar., n. s. 2, 255) (*K. drymeia* × *S. pratensis*) IK 1959, POWO 2025.

Linnaeoideae 6: 20. **1 IG**

Abelia, Dipelta, Kolkwitzia, Linnaea, …

Abelia × *Kolkwitzia* **EC** (→ × *Kobelia amabilis* Naranjo & Robacker 2022 *(A. chinensis* × *K. amabilis*, EC, sterile), POWO 2025

References:

Kim Y-D & Kim S-H (1999) Phylogeny of *Weigela* and *Diervilla* (Caprifoliaceae) based on nuclear rDNA ITS sequences: biogeographic and taxonomic implications. J. Plant Res. 112, 331–341. https://dx.doi.org/10.1007%2FPL00013887

Naranjo LL & Robacker CD (2022) *Kolkwitzia* × *Abelia*: A new *Abelia* hybrid with ornamental potential? HortSci 57, 774–776. https://doi.org/10.21273/HORTSCI16562-22

Touchell D, Viloria Z & Ranney T (2006) Intergeneric hybrids between *Weigela* and *Diervilla*

(Caprifoliaceae). HortScience 41 (4), 1008. https://doi.org/10.21273/HORTSCI.41.4.1008D
Yokoyama J et al. (2002). The intersectional hybrid between *Weigela hortensis* and *W. maximowiczii* (Caprifoliaceae). Botanical Journal of the Linnean Society 138, 369–380. doi: 10.1046/j.1095-8339.2002.00033.

Caricaceae (Brassicales) 6: 28. **1 IG**

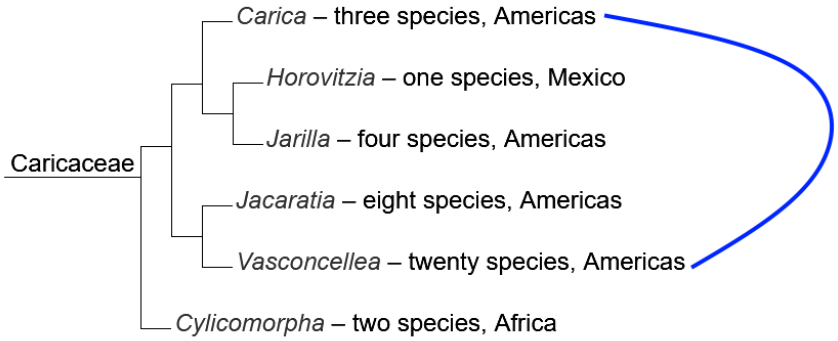
papaya family = Melonenbaumgewächse

Carica (incl. *Papaya*°) 3, *Cylicomrpha 2* (Africa), *Vasconcellea 20*, …

Probably **basic type Caricaceae** (6: 28): The two distant genera *Carica* and *Vasconcellea*, formerly thought to be closely related, are linked by hybridization.

IS: POWO 2026: *Vasconcellea 1 IS (pubescens × stipulata,* nat. hyb. → *V. × pentagona = heilbornii).*

Carica × Vasconcellea Horovitz & Jimenez 1967, Vegas et al. 2003, Sajise et al. 2004, Dinesh et al. 2007



Caricaceae: hybrid connections in the phylogeny of Carvalho & Renner 2013 https://doi.org/10.3897%2Fphytokeys.29.6103, from en.wikipedia (2026, CC BY SA 4.0).

References:

Dinesh MR et al. (2007) Breaking the intergeneric crossing barrier in papaya using sucrose treatment. Scientia Horticulturae 114, 33–36.
Drew R et al. (2007) Intergeneric hybridisation between *Carica papaya* and wild *Vasconcellea* species and identification of a PRSV-P resistance gene. Acta Hort. (ISHS) 738, 165–169.
Horovitz S & Jimenez H (1967) Report on the interspecific and intergeneric crossing in Caricaceae and its phytotechnical implications. 7th Latin America Plant Technique Meeting. Maracay, Venezuela 1967, pp. 98–99.
Jayavalli et al. (2011) Breaking the intergeneric hybridization barrier in *Carica papaya* and *Vasconcellea cauliflora*. Scientia Horticulturae 130, 787–794. https://doi.org/10.1016/j.scienta.2011.09.004
Sajise AGC et al. (2004) Cross compatibility of elite papaya inbred lines to an intergeneric hybrid of *Carica papaya* L. × *Vasconcellea quercifolia* (Saint-Hil.) Hieron. New Directions for a Diverse Planet: Proceedings of the 4th International Crop Science Congress, Brisbane, 26 Sept 1 Oct 2004. http://www.cropscience.org.au/icsc2004/poster/3/4/3/1220_godwin.htm?print=1

Vegas A et al. (2003) Obtention, regeneration and evaluation of intergeneric hybrids between *Carica papaya* and *Vasconcellea cauliflora*. [Spanish] Interciencia 28 (12), 710–714. http://www.interciencia.org/v28_12/indexe.html

Caryophyllaceae (Caryophyllales) 66: 2200

carnation family or pink family = Nelkengewächse

The division of the family is problematic.

AP website 2025: 11 tribes:

Alsineae, Arenarieae, Caryophylleae, Corrigioleae (= Molluginaceae p. p.) 2: 16, Eremogoneae 2: 68, Paronychieae (= Illecebraceae p. p.) 15: 900, Polycarpaeae, Sagineae, Scleranthеae, Sileneae 6: 738, Sperguleae.

Alsineae 16: 545

Alsinidendron° (= *Schiedea* p. p.) × *Schiedea* **IS** Weller & Sakai 1991, Weller et al. 2001

Caryophylleae 14: 730. **1 IG**

Dianthus barbatus, caryophyllus × *Gypsophila paniculata* **SO** somatic hybrid, probably asymmetric Nakano & Mii 1993, Nakano et al. 1996 (symmetric?)

Saponaria × *Vaccaria*° (= *Gypsophila* p. p.) Khoshoo & Bhatia 1961, Maheshwari 1962, Knobloch 1972

Sileneae 6: 800

Silene 486, …

Coronaria° (*Lychnis*°, *Silene*) × *Melandrium*° (*Silene*) **IS** (→ „× *Coromelandryum*“ Graebn. 1920 in Aschers. & Graebn. Syn. Mitteleur. Fl. 5, 11, 54, art. hyb.; = × *Coromelandrium roseum*)

Lychnis° (*Silene*°) div. spec. × *Silene* (incl. *Melandrium*°) div. spec. **IS** (→ × *Lychnisilene* Ciferri & Giacom. 1954 Nomencl. Fl. Ital., Pt. 2, 291) IK 1947, Crang & Dean 1971, Knobloch 1972 (10 nothospecies), IK 1974, Willis 1985, Zenkteler et al. 2005 (**EC**), Jiang et al. 2014, POWO 2025 (*Silene* IS)

References:

Crang RE & Dean HL (1971) An intergeneric hybrid in the Sileneae (Caryophyllaceae). Bull. Torrey Bot. Club 98, 214–217. http://www.jstor.org/pss/2483687

Jiang L et al. (2014) Cross-compatibility in intraspecific and interspecific hybridization within *Lychnis* and intergeneric hybridization between *Lychnis* and *Silene*. HortScience 49, 1136–1141.

Khoshoo TN & Bhatia SK (1961) Cytogenetics of the intergeneric hybrid, *Vaccaria grandiflora* by *Saponaria vaccaria*. Current Science 30 (9), 327–328.

Kruckeberg AR (1961) Artificial crosses of western North American *Silenes*. Brittonia 13, 305–333.

Kruckeberg AR (1962) Intergeneric hybrids in the Lychnideae (Caryophyllaceae). Brittonia 14, 311–321 http://www.jstor.org/pss/2805248 hybridization within *Silene* s. l.

Maheshwari JK (1962) A comment on cytogenetics of intergeneric hybrid *Vaccaria grandiflora* × *Saponaria vaccaria*. Current Science 31 (5), 212 ff.
Nakano M & Mii M (1993) Callus and root formation from an intergeneric somatic hybrid between *Dianthus caryophyllus* and *Gypsophila paniculata*. Scientia Horticulturae (Amsterdam) 53 (1–2), 13–19.
Nakano M, Hoshino Y & Mii M (1996) Intergeneric somatic hybrid plantlets between *Dianthus barbatus* and *Gypsophila paniculata* obtained by electrofusion. Theoretical & Applied Genetics 92 (2), 170–172. **SO** somatic, symmetric?
Weller SG & Sakai AK (1991) The genetic basis of male sterility in *Schiedea* (Caryophyllaceae), an endemic Hawaiian genus. Heredity 67, 265–274.
Weller SG et al. (2001) Artificial and natural hybridization in *Schiedea* and *Alsinidendron* (Caryophyllaceae: Alsinoideae): the importance of phylogeny, genetic divergence, breeding system, and population size. Syst. Bot. 26, 571–584.
Zenkteler M et al. (2005) Embryological studies on ovules of *Melandrium album* pollinated in vitro with *Lychnis coronaria* pollen grains. Acta Biol. Cracoviensia Ser. Bot. 47 (1), 135–138.

Cercidiphyllaceae (Saxifragales) 1: 2 + fossil taxa

katsura = Katsura- oder Judasblattbäume

Living fossil.

Cercidiphyllum 2.

Probably **basic type family Cercidophyllaceae** (1: 2): monogeneric family with a unique set of characteristics.

Chenopodiaceae → Amaranthaceae

Cistaceae (Malvales) 8: 207. **1 IG**

rock-rose family = Zistrosengewächse

Monophyletic. But the subdivision varies much according to the author,
3 tribes:
Cisteae 6: 181, Fumaneae 1: 9, Lecheeae 1: 17.

Cisteae 6: 181

Cistus 18, Halimium 30 (incl. *Crocanthemum°), Helianthemum 136, Hudsonia 3, Tuberaria 12, Pakaraimaea (*position unresolved*).*

IS: POWO 2026 *Cistus 105 IS, Halimium 3 IS, Helianthemum 43 IS, Hudsonia 1S, Tuberaria 1 IS.*
Some authors include *Halimium* in *Cistus.*

In **Cistaceae tribe Cisteae** the high number of 105 interspecific hybrids in genus *Cistus* with only 18 species is remarkable, supplemented by 11 nothospecies connecting the genera *Cistus* and *Halimium* which by some authors are classified as congeneric. Thus, probably all species of *Cistus* s. l. (48) belong to the same basic type.

Cistus salvifolius × *Halimium* div. spec. Cisteae (→ × *Halimiocistus* Janchen 1925 in Engler & Prantl, Nat. Pflanzenfam. ed. 2, 21: 304) IK 1929, Knobloch 1972 (11 nothospecies!), Willis 1985, Zander 2008, POWO 2026 (10 nothospecies), AP website 2026

Colchicaceae (Liliales) 15: 255

meadow saffron or autumn-crocus family =Herbstzeitlosengewächse

AP website 2025: 3 subfamilies.

IS: POWO 2026: *Colchicum 3 S, Disorum 1 IS.*

Colchicoideae 9: 210

3 tribes.

Colchiceae 5: 170. **1 IG**

Colchicum, Hexacyrtis, Gloriosa (incl. *Littonia*°), *Ornithoglossum, Sandersonia.*

Gloriosa × *Littonia*° (= *Gloriosa* p. p.) **IS** Amano et al. 2007, 2008

Gloriosa × *Sandersonia* **EC** Nakamura et al. 2005, Amano et al. 2007, Nakamura et al. 2007

Littonia° (= *Gloriosa* p. p.) × *Sandersonia* **EC** art. hyb. (→ × *Santonia* Eason, E. R. Morgan Mullan & G. K. Burge 2001 Postharv. Biol. Technol. 22: 93) Morgan et al. 2001, 2003, Amano et al. 2007, IPNI 2011, POWO 2025

References:

Amano J et al. (2007) Early identification of intra- and intergeneric hybrids among Colchicaceous ornamentals, *Gloriosa* spp., *Littonia modesta* Hook. and *Sandersonia aurantiaca* Hook., by flow cytometry and random amplified polymorphic DNA analyses. J. Japan. Soc. Hort. Sci. 76, 73–78. http://www.ingentaconnect.com/content/klu/euph/2011/00000181/00000002/00000393

Amano J et al. (2008) Morphological characterization of three intergeneric hybrids among *Gloriosa superba* 'Lutea', *Littonia modesta*, and *Sandersonia aurantiaca* (Colchicaceae). HortScience 43 (1), 115–118.

Burge GK et al. (2008) *Sandersonia aurantiaca*: domestication of a new ornamental crop. Sci Hort. 118 (2) 87–99.

Morgan ER et al. (2001) Wide crosses in the Colchicaceae: *Sandersonia aurantiaca* (Hook.) × *Littonia modesta* (Hook.). Euphytica 121, 343–348. **EC**

Morgan ER et al. (2003) 'Santonia Golden Lights': A novel intergeneric hybrid of *Sandersonia* and *Littonia* (Colchicaceae). HortScience 38, 466–467.

Nakamura T et al. (2005) Production of intergeneric hybrid plants between *Sandersonia aurantiaca* and *Gloriosa rothschildiana* via ovule culture (Colchicaceae). Euphytica 142, 283–289. http://www.springerlink.com/content/kx23jk15k76k/?p=cdff430ce6b042e28b0ae585519ba64a&pi=33

Convolvulaceae (incl. Cuscutaceae) (Solanales) 60: 1600

IPNI 2011: 9 IS (*Calystegia 3, Convolvulus 2, Ipomoea* (incl. *Quamoclit*°) 4.)

Cornaceae (Cornales) 2: 115

According to en.wikipedia 2024 the systematics of Cornaceae has been remarkably unsettled and controversial, and many genera have been added to it and removed from it over time. Some authors split *Cornus* into several separate genera.
AP website 2025*: Alangium 50, Cornus 65* (incl. *Swida*°).

POWO 2025: *Cornus 5 IS*

Crassulaceae (Saxifragales) 34: 1480

crassulas, stonecrops = Dickblattgewächse
The subdivision of the family is still matter of discussion.
3 subfamilies (AP website 2025):
Crassuloideae 1: 200.
Cotyledonoideae = Kalanchoideae 4: 240.
Sempervivoideae 30: 1005.

Crassuloideae 1: 200

Crassula 200 (incl. *Tillaea*°).

IS: IPNI 2013: *Crassula 10 IS.*

Probably **basic type Crassulaceae subfamily Crassuloideae** (*Crassula*) (1: 200). The subfamily is monophyletic and separated from Sempervivoideae by several molecular and morphological characters (t'Hart 1995, p. 163), e.g. leaves opposite, generally with hydathodes at the leaf margin and one whorl of stamina only.

Crassula × *Rochea*° (= *Crassula* p. p.) **IS** (→ × *Rocheassula* Rowley 1973 in Nation. Cact. Succ. J. (U. K.) 28, 7) IK 1981
Globulea° (= *Crassula* p. p.) × *Purgosea*° (= *Crassula* p. p.) **IS** (→ × *Purgobulea* P. V. Heath 1995 in Calyx 5, 48 – as „× *Pyrgobulea*" = *Crassula serpentaria*) IK 1996
Kalosanthes° (= *Crassula* p. p.) × *Rochea*° (= *Crassula* p. p.) **IS** (→ × *Kalorochea* Veitch 1898 in J. Roy. Hort. Soc. 22, p.146) IK 1981

Cotyledonoideae = Kalanchoideae 4: 200

Adromischus, Cotyledon, Kalanchoe 145 (incl. *Bryophyllum*°, *Kitchingia*°), *Tylecodon 46.*

IS: IPNI 2013*: Adromischus 1, Kalanchoe 50.*

Bryophyllum° (= *Kalanchoe* p. p.) × *Kalanchoe* **IS** (→ × *Bryokalanchoe* Resende 1956 in Bol. Soc. Portug. Cienc. Nat. 21, 241) IK 1974, POWO 2025

Sempervivoideae (= Sedoideae) 30: 1005. **in total: 5 IG + 1IT**

The subdivision is matter of debate. AP website 2025: no subdivision! Monophyletic.
5 tribes according to Messerschmid et al. 2020:
Aeonieae 3: 70.
Sedeae 12: 520.
Semperviveae 2: 75.
Telephieae 6: 50.
Umbiliceae 5: 100.

Probably **basic type Crassulaceae subfamily Sempervivoideae** (30: 1005). The subfamily is monophyletic (Messerschmid et al. 2020). The genera are closely related, and it is not easy to define their exact delimitations or to construct a precise subdivision of the subfamily. For hybrids between tribes see the figure below. The connection between *Aeonium* and *Sempervivum* is intertribal (Aeonieae –Semperviveae); it was confirmed in 2020, see the figure below. – It is necessary to wait for a revised taxonomy of the subfamily.

Sedum s. l. is highly polyphyletic, and its species currently belong to different tribes!!
Aeonieae *Sedum caeruleum, jaccardianum, modestum, pubescens, surculosum.*
Sedeae Acre-clade: *350*, Leucosedum-Clade *120*.
Semperviveae (*Petrosedum 17* = *Sedum* ser. *Rupestria*) *forsterianum, ochroleucum, rupestre, sediforme, …*
Telephieae (*Hylotelephium 29* = *Sedum* subgen. *Telephium) Sedum telephium, spectabile, …*
Umbiliceae (*Phedimus 18*) *Sedum aizoon, hybridus, kamtschaticus, spurius, …*

Therefore, in hybrids comprising „*Sedum*“ as one parent, it is important to know the species. On the other hand, this situation shows the very close relation of the members of Sempervivoideae. – For proposals to resolve the *Sedum*-problem and the taxonomy of the subfamily, see Messerschmid et al. 2020. In their summary they write: “we believe that combination of all 14 genera currently recognized in tribe Sedeae (= clades Leucosedum plus Acre) into *Sedum* might be the most stable solution of the “*Sedum* problem”. This new *Sedum* s. l. would then comprise approximately 755 species.”

Aeonieae 5: 70. **4 IG + 1 IT**

Aeonium (incl. *Greenovia*°), *Aichryson, Hypagophytum 1, Monanthes*, *Sedum* p. p. (*caeruleum, jaccardianum, modestum, pubescens, surculosum*)

IS: IPNI 2013: *Aeonium 65, Aichryson 6, Greenovia 1, Monanthes 13,*

Aeonium × *Aichryson* Aeonieae (→ × *Aeonichryson* P. V. Heath 1992 in Calyx 2, 59; = *Sempervivum aizoides*) IK 1996, Scarlet 2025
Aeonium × *Aichryson* × *Monanthes* Aeonieae Scarlet 2025
Aeonium × *Monanthes* Aeonieae Scarlet 2025
Aeonium div. spec. × *Greenovia*° (= *Aeonium*) div. spec. **IS** Aeonieae (→ × *Greenonium* G. D. Rowley 1958 Nat. Cact. Succ. J. 13, 758 = „× *Aeoniogreenovia*“ Voggenreiter 1974 in Diss. Bot. 26, not in accordance with the code art. 11.2, H 4.1, 317–324; cf. Voggenreiter 1974 in Cuad. Bot. Canar. 25, 15) (nat. hyb.), Praeger 1932, Rowley 1982, IK 1996, Eggli 2003 (sub *Aeonium* s. l.)
Aeonium × *Sempervivum* **IT** Aeonieae × Semperviveae (→ × *Semponium* D. Michael 2020 CactusWorld) Smith 1979, Lea & Michael 2020 (art. hyb. *A.* ‘Ice Warrior’ × *S.* ‘Green Ice’),

POWO 2025 (accepted, with picture, several cultivars)
Aichryson × *Monanthes* Scarlet 2025

Sedeae 12: 520

AP-website 2025 includes the following genera in *Sedum*, so that all hybrids listed are now **IS**: *Afrovivella, Cremnophila, Dudleya, Echeveria, Graptopetalum* (incl. *Byrnesia*°), *Lenophyllum, Pachyphytum, Pistorinia, Prometheum, Rosularia, Sedella, Sedum 470, Thompsonella, Villadia.*

IS: IPNI 2013*: Dudleya 1, Echeveria 31.*

Byrnesia° (= *Graptopetalum* p. p.) × *Echeveria* Sedeae (→ × *Echenesia* P. V. Heath 1994 in Calyx 4, 132) IK 1996
Courantia° (= *Echeveria* p. p.) × *Pachyphytum*° (= *Sedum* p. p.) Sedeae (→ × *Pachyrantia* Walth. 1931 in Cact. & Succ. Journ. Amer. 3, 11, in obs.) IK 1938
Cremnophila linguifolium (= *Sedum* p. p.) × *Echeveria elegans* Sedeae (→ × *Cremneria* Moran 1975 in Baileya 19, 145) Knobloch 1972, IK 1981, Eggli 2003
Cremnophila × *Echeveria* × *Graptopetalum* Sedeae (→ × *Cremnovelum* Bischofb. 2025) POWO 2025
Cremnophila linguifolium × *Graptopetalum fruticosum* Sedeae (→ × *Cremnopetalum* Kimnach & Moran 1986 Cact. Succ. J. (US) 58, 55) Knobloch 1972, Eggli 2003
Cremnophila nutans × *Sedum humifusum* Sedeae (→ × *Cremnosedum* M. Kimnach & G. L. Lyon 1981 in Cact. Succ. J. (U. S. A.) 53, 69) IK 1991, Eggli 2003
Cremnophila (= *Sedum* p. p.) × *Thompsonella* Sedeae (→ × *Cremsonella* C. H. Uhl 1994 in Cact. Succ. J. (U.S.A.) 66, 177: *C. nutans* × *T. minutiflora*) IK 1996, Eggli 2003
Cremnophila (= *Sedum* p. p.) × *Villadia* Sedeae (→ × *Cremnadia* C. H. Uhl 1994 in Cact. Succ. J. (U.S.A.) 66, 215) (*C. nutans* × *V. nelsonii*) IK 1996, Eggli 2003
Dudleya × *Echeveria* (this cross is doubted by Uhl 1994a) (→ × *Dudleveria* Rowley 1958 in Nat. Cact. & Succ. Journ. 13, 75) IK 1966, Knobloch 1972, Willis 1985
Dudleya × *Hasseanthus*° (= *Dudleya* p. p.) **IS** (→ × *Hasseleya* J. M. H. Shaw 2018) (this cross is doubted by Uhl 1994a) Knobloch 1972, POWO 2025 (unplaced)
Dudleya × *Tylecodon* **ISF** Sempervivoideae × Cotyledonoideae (→ × *Dudledon* S. A. Hammer 2004 Mesemb Study Group Bull. 19, 6) POWO 2025 (unplaced)
Echeveria × *Graptopetalum* Sedeae (→ × *Graptoveria* Gossot in Marnier-Lapostolle 1949; Rowley 1958 in Nat. Cact. & Succ. Journ. 13, 75; = "× *Echepetalum*") IK 1966, Knobloch 1972, Rowley 1982, Willis 1985, Eggli 2003
Echeveria × *Graptopetalum* × *Pachyphytum* Sedeae (→ × *Graptophyria* Bischofb.) POWO 2025
Echeveria × *Graptopetalum* × *Sedum* Sedeae (→ × *Graptovedum* Bischofb.) POWO 2025
Echeveria div. spec. × *Lenophyllum* Sedeae (→ × *Lenoveria* C. H. Uhl 1993 in Cact. Succ. J. (U. S. A.) 65, 272) IK 1996, Eggli 2003
Echeveria div. spec. × *Pachyphytum* div. spec. Sedeae (→ × *Pachyveria* hort. ex Haage & Schmidt 1926 apud A. Berger 1930 in Engler & Prantl, Nat. Pflanzenfam. 18a, 481; = × *Echephytum* Gossot 1938 in Notre Vallée, Nos. 24, 25, 35, 38) IK 1938, Knobloch 1972, Willis 1985, Zander 2008, Eggli 1994, Eggli 2003
Echeveria × *Pachyphytum* × *Sedum* Sedeae (→ × *Pachevedum* Bischofb. 2009 Int. Cact. Advent.

81: 27; cf. Repert. Pl. Succ. 60:10 (2010)) (trigeneric) IPNI 2013, *P. oviferum* × *E. derenbergii* × *S. morganianum*

Echeveria derenbergii × *Sedum* Sedeae (→ × *Sedeveria* E. Walther 1953 in Cact. & Succ. Journ. Amer. 25, 20) (art. hyb. *E. derenbergii* × *S. pachyphyllum* → × *Sedeveria hummellii*) IK 1959, Knobloch 1972, Eggli 1994, Eggli 2003, Gallo et al. 2020 (nat. hyb. *E. agavoides* × *S. pachyphyllum* → × *Sedeveria mauroi* introduced species in Italy), POWO 2025

Echeveria div. spec. × *Thompsonella* Sedeae (→ × *Thompsoveria* C. H. Uhl 1995 in Cact. Succ. J. (U. S. A.) 66, 177) IK 1996, Uhl 1994 b, Eggli 20 03

Echeveria chapalensis × *Villadia grandisepala* Sedeae (→ × *Villeveria* C. H. Uhl 1995 in Cact. Succ. J. (U. S. A.) 66, 215) IK 1996, Uhl 1994 c, Eggli 2003

Graptopetalum div. spec. × *Lenophyllum* div. spec. Sedeae (→ × *Lenaptopetalum* G. D. Rowley 1982 in Nation. Cact. Succ. J. (U. K.) 37, 77 = „× *Lengraptophyllum*“ 1980 G. D. Rowley, Name that Succulent, 154, not according to Art. H 7) Knobloch 1972, IK 1987, Uhl 1993, Eggli 2003

Graptopetalum filiferum × *Pachyphytum oviferum* Sedeae (→ × *Graptophytum* Gossot in Marnier Lapostolle 1949) Knobloch 1972, Rowley 1982, Eggli 2003

Graptopetalum × *Pachyphytum* × Sedum Sedeae (→ × *Setophytum* Bischofb. 2022) POWO 2025)

Graptopetalum × *Sedum* Sedeae (→ × *Graptosedum* 1980 G. D. Rowley, Name that Succulent, 153) (*G. fruticosum* × *S.* div. spec.) Knobloch 1972, IK 1987, Eggli 1994, Eggli 2003

Graptopetalum × *Tacitus*° (= *Graptopetalum* p. p.) **IS** Sedeae (→ × *Tacipetalum* C. H. Uhl 1995 in Cact. Succ. J. (U. S. A.) 67, 144) IK 1996

Graptopetalum × *Thompsonella* Sedeae (→ × *Grapsonella* 1980 G. D. Rowley, Name that Succulent, 152) Uhl 1970, Knobloch 1972, IK 1987, Uhl 1994b, Eggli 2003

Graptopetalum fruticosum × *Villadia* Sedeae (→ × *Graptoladia* C. H. Uhl 1994 in Cact. Succ. J. (U. S. A.) 66, 216) IK 1996, Uhl 1994c, Eggli 2003

Lenophyllum reflexum × *Pachyphytum hookeri* Sedeae (→ × *Lenophytum* C. H. Uhl 1993 in Cact. Succ. J. (U. S. A.) 65, 273) Uhl 1993, IK 1996, Eggli 2003

Pachyphytum × *Sedum* Sedeae (→ × *Pachysedum* Jacobsen 1970 Sukkulent. Lex., 274) IK 1974, Rowley 1982, Eggli 1994, Eggli 2003

Pachyphytum × *Tacitus*° (= *Graptopetalum* p. p.) Sedeae (→ × *Taciphytum* C. H. Uhl 1995 in Cact. Succ. J. (U. S. A.) 67, 145) IK 1996

Pachyphytum hookeri × *Thompsonella* div. spec. Sedeae (→ × *Thompsophytum* C. H. Uhl 1994 in Cact. Succ. J. (U. S. A.) 66, 179) IK 1996, Eggli 2003

Pachyphytum × *Urbinia*° (= *Echeveria* p. p.) Sedeae (→ × *Urbiphytum* Gossot 1938 in Notre Vallee, Nos. 24, 25, 34) IK 1959

Pachyphytum hookeri etc. × *Villadia nelsonii* etc. Sedeae (→ × *Pachyladia* C. H. Uhl 1994 in Cact. Succ. J. (U. S. A.) 66, 216) Uhl 1994c, IK 1996, Eggli 2003

Sedum × *Tacitus*° (= *Graptopetalum* p. p.) Sedeae (→ × *Tacisedum* Bischofb. 2009 Int. Cact. Advent. 81: 25; cf. Repert. Pl. Succ. 60: 10 (2010)) IPNI 2013

Sedum div. spec. × *Thompsonella* div. spec. Sedeae (→ × *Thompsosedum* C. H. Uhl 1995 in Cact. Succ. J. (U. S. A.) 66, 179) Uhl 1995, IK 1996, Eggli 2003

Sedum × *Urbinia*° (= *Echeveria* p. p.) Sedeae (→ *Sedurbinia* Nigel Taylor 1972 in Cact. Succ. J. Gt. Brit. 34, 91 = × *Sedeveria*) IK 1981

Sedum div. spec. × *Villadia* Sedeae (→ × *Sedadia* Moran 1975 in Baileya 19, 147) Knobloch 1972,

IK 1981

Semperviveae 2–3: 75. **1 IT**

Petrosedum 17 (= *Sedum* ser. *Rupestria*) *forsterianum, ochroleucum, rupestre, sediforme, …* *Sempervivum* (incl. *Jovibarba° globifera, heuffelii)*).

IS: Gallo (2012), en.wikipedia (2025) *Petrosedum* (= *Sedum* ser. *Rupestria) 11 IS.*
POWO (2026) *Sempervivum 19 IS.*

Aeonium × *Sempervivum* **IT** Aeonieae × Semperviveae (→ × *Semponium* D. Michael 2020 CactusWorld) Smith 1979, Lea & Michael 2020 (art. hyb. *A.* 'Ice Warrior' × *S.* 'Green Ice'), POWO 2025 (accepted, with picture, several cultivars)

Jovibarba div. spec. × *Sempervivum* div. spec. **IS** Semperviveae → × *Jovivum* G. D. Rowley 1980 Name that Succulent, 154) Stojanov & Stefanov 1948 (*J. heuffelii* × *S. marmoreum*, Bulgaria, without description), Favarger et al. 1968 (*J. globifera* ssp. *hirta* = *Diopogon h.* × *S. montanum*, art. hyb), Rowley 1982, IK 1987, Eggli 2003 (sub *Sempervivum*), POWO 2025

Telephieae 6: 50. **1 IG**

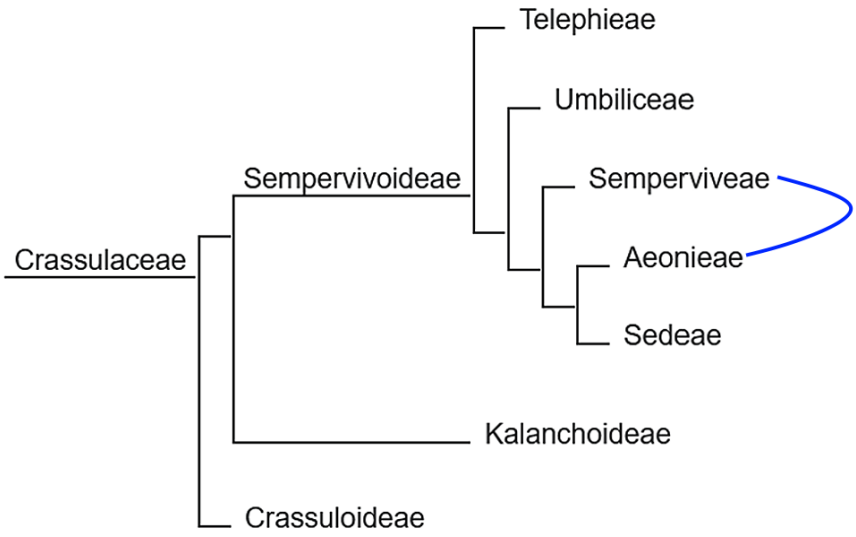
Hylotelephium 29 (formerly *Sedum* subgen. *Telephium*) (1 IS), *Kungia 2*, *Meterostachys 1*, *Orostachys 13*, *Perrierosedum*, *Sinocrassula 5.*

IS: IPNI 2013: *Hylotelephium 2 IS.*

Hylotelephium (=„*Sedum*") × *Orostachys* Telephieae (→ × *Hylostachys* J. M. H. Shaw 2017 art. hyb. Sedum Society Newsletter 121: 62, April 2017, mainly called by the incorrect name „× *Sedoro*" 'Blue Elf' Garden Crossings LLC (US)

Umbiliceae 5: 100

Aizopsis, Phedimus 18 (= *Sedum aizoon, hybridus, …*), *Pseudosedum*, *Rhodiola*, *Umbilicus.*



Crassulaceae: hybrid connections in the phylogeny of Thiede & Eggli (2007. https://doi.org/10.1007/978-3-540-32219-1%2012), from de.wikpedia (2026, CC BY SA 4.0).

References:

Eggli U (1994) Sukkulenten. Stuttgart: Ulmer.

Eggli U (2003) Illustrated Handbook of Succulent Plants: Crassulaceae. Heidelberg: Springer.

Eggli U & Taylor N (1994) List of names of succulent plants other than cacti published 1950–1992 from Repertorium Plantarum Succulentarum. Kent: Whitstable Litho.

Favarger C et al. (1968) Hybrides interspécifiques et intergénériques chez les Joubarbes. Schweizer. Ges. Vererbungsforschung, Jahresbericht 28, (18)–(30).

Gallo L (2012) Natural hybrids in *Sedum* series *Rupestria* Berger (Crassulaceae): a review of taxonomy and nomenclature. Forum Geobotanicum 6, 1–13. doi 10.3264/FG.2012.0710 now *Petrosedum*

Gallo L et al. (2020) × *Sedeveria mauroi* (Crassulaceae), a new alien species established in NE Italy. Bradleya 38, 187–194.

International Crassulaceae Network https://www.crassulaceae.ch/de/artikel?akID=177&aaID=2&aiID=B&aID=5406

Lea M & Michael D (2020) A New *Aeonium* and *Sempervivum* hybrid. CactusWorld 38 (1), 30. https://www.jstor.org/stable/27198823

Messerschmid TFE et al. (2020) Linnaeus's folly – phylogeny, evolution and classification of *Sedum* (Crassulaceae) and Crassulaceae subfamily Sempervivoideae. Taxon. 69, 892–926. open access

Nikulin V et al. (2016) Phylogenetic relationships between *Sedum* L. and related genera (Crassulaceae) based on ITS rDNA sequence comparisons". Flora. 224, 218–229. doi: 10.1016/j.flora.2016.08.00

Rowley GD (1982) Intergeneric hybrids in succulents. National Cactus and Succulent J. 37, 76–80.

Scarlet (2025) I've successfully created four new types of intergeneric hybrids involving *Aeonium*, *Monanthes*, and *Aichryson*! https://www.reddit.com/r/succulents/comments/1lhq4x9/ive_successfully_created_four_new_types_of/ no scientific publication

Smith MC (1979) Houseleeks. Quarterly Bull. Alpine Garden Soc. 47, 72–81. http://stalikez.info/fsm/semp/site/jov_gb.php

Stojanov N & Stefanov B (1948) Flora na Bulgarija. Ed. 3. Sofia.

t'Hart H (1995) Infrafamilial and generic classification of the Crassulaceae. pp. 159–172 in t'Hart H & Eggli U (ed.) Evolution and Systematics of the Crassulaceae. Leiden: Backhuys.

't Hart H et al. (1999) Biosystematic, molecular and phytochemical evidence for the multiple origin of sympetaly in Eurasian Sedoideae (Crassulaceae). Biochem. Syst. Ecol. 27, 407–426.

't Hart H & Eggli U (eds.) (1995) Evolution and Systematics of the Crassulaceae. Leiden: Backhuys Publishers.

Thiede J & Eggli U (2007) Crassulaceae. p. 83–118, in Kubitzki K (ed.), The families and genera of vascular plants. Volume IX. Berlin: Springer.

Uhl CH (1976) Chromosomes, hybrids and ploidy of *Sedum cremnophila* and *Echeveria linguifolia* (Crassulaceae). Amer. J. Bot. 63, 806–820.
Uhl CH (1982) The problem of ploidy in *Echeveria* (Crassulaceae) 2. Tetraploidy in *Echeveria secunda*. Amer. J. Bot. 69, 1497–1511.
Uhl CH (1992) Polyploidy, dysploidy and chromosome pairing in *Echeveria* Crassulaceae and its hybrids. Amer. J. Bot. 79, 556–566.
Uhl CH (1993) Intergeneric hybrids in the Mexican Crassulaceae. I. *Lenophyllum*. Cactus and Succulent J. 65, 271–273. http://www.crassulaceae.com/botanik/pflanzen/botanzeige_scan_en.asp?gnr=1630&cat=&scan=1630-1
Uhl CH (1994a) Intergeneric hybrids in the Mexican Crassulaceae. II. *Dudleya*. Cactus and Succulent J. 66, 74–80.
Uhl CH (1994b) Intergeneric hybrids in the Mexican Crassulaceae. III. *Thompsonella*. Cactus and Succulent J. 66, 175–179.
Uhl CH (1994c) Intergeneric hybrids in the Mexican Crassulaceae. IV. *Villadia*. Cactus and Succulent J. 66, 214–217.
Uhl CH (1995) Intergeneric hybrids in the Mexican Crassulaceae. V. Cactus and Succulent J. 67, 144–145.

Ceratophyllaceae (Ceratophyllales) 1: 6 + 2 extinct genera.

hornwort family = Hornblattgewächse

AP website 2024: 1 genus, 3 sections.
The order includes only Ceratophyllaceae + extinct † Montsechiaceae.

Possibly **basic type family Ceratophyllaceae** (*Ceratophyllum***)** (1: 6). The monogeneric family and the corresponding order Ceratophyllales differ from all other extant orders in several respects (e.g. no roots) and belong neither to Monocotyledoneae nor to Dicotyledoneae! Hybrids are unknown.

Cucurbitaceae (Cucurbitales) 98: 1000. **3 IG**

gourd family= Kürbisgewächse

Attempts to subdivide the family differ very much!
AP website 2025: 15 tribes:
e. g. Benincaseae 24: 210.

In **Cucurbitaceae** (98: 1000) only 3 intergeneric hybrids and no confirmed intertribal hybrids have been reported. The family is rather uniform and the genetic distances between the tribes are small, so that it is a possible candidate for a basic type. But from a hybrid view it is too soon to give a definite evaluation. – Brophy et al. (2003) suggest a monobaraminic status for the family.

IS: POWO 2026: *Cucurbita 1 IS. Momordica 1 IS.*
For *Coccinia* IS see Holstein S (2015) https://doi.org/10.3897/phytokeys.54.3285.

See also the (unconfirmed) hybridogram and the references cited by Brophy et al. (2023).

Benincasa (*"Praecitrullus fistulosus"*) × *Citrullus* Benincaseae Gol'Dgauzen 1961

Coccinia grandis (*„indica"*) × *Diplocyclos palmatus* (*"Bryonopsis laciniosa"*) Benincaseae Roy & Roy 1971 (art. hyb.). closely related

Cucumis melo, sativus × *Thladiantha* spec. **IT** Benincaseae × Thladiantheae (art. hyb.) Brezhnev 1962 (Michurin). unconfirmed

Cucurbita pepo × *Luffa cylindrica* **IT** Cucurbiteae × Sicyoeae Yang & Cao 1981 (viable seeds), hybridity not confirmed.

Echinocystis × *Sicyos* Sicyoeae (→ × *Echinosicyos* Kamner & Topa 1952 in Stud. Cerc. Stint. Cluj. Acad. Republ. Popul. Romane 3, 163) IK 1970, Willis 1985, POWO 2026

Gynostemma × *Luffa* **IT** Gomphogyneae × Sicyoeae Ito et al. 1991. **SO.** No plants, but only cell lines. Probably asymmetric

Momordica charantia × *Trichosanthes anguina* **IT** Momordiceae × Trichosantheae Patrude & Krishnamurthy 1934, Knobloch 1972. Unconfirmed. The cross is adopted, but not confirmed by Roy & Roy 1971.

References:

Brezhnev DD (1960; English Transl. 1962) wide hybridization in vegetable breeding. pp. 39–47 in Tsitsiv (ed) Wide hybridization in plants. Jerusalem. http://www.bulbnrose.org/Heredity/BrezhnevHybrids1960.html

Brophy TR et al. (2023) Hybridization and genetic distances suggest one large monobaramin in the gourd family (Cucurbitales: Cucurbitaceae) [poster]. In J. H. Whitmore (ed.), Proceedings of the Ninth International Conference on Creationism, pp. 657–658. Cedarville, Ohio: Cedarville University. International Conference on Creationism. https://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1208&context=bio_chem_fac_pubs The arguments seem not enough for a definite evaluation as a basic type

Gol'Dgauzen MK (1961) Intergeneric hybrids of *Praecitrullus* with *Citrullus*. Referat. Zhur., Biol., 1962, No. 20G146. (Translation). Tr Moldavsk Nauchn Issled Inst Oroshaemogo Zemledeliya I Ovoshchevodstva 3, 217–24.

Ito M et al. (1991) Hybrid cell lines produced by protoplast fusion between *Luffa cylindrica* ROEM. and *Gynostemma pentaphyllum* MAKINO. Japanese J. Breeding 41, 325–330. doi 10.1270/jsbbs1951.41.325 only cell lines and possibly asymmetric

Roy RP & Roy PM (1971) An intergeneric cross in the Cucurbitaceae (*Coccinia indica* W. and A. × *Bryonopsis laciniosa* Arn.). Current Science 49, 46–48. now: *Coccinia* × *Diplocyclus*

Yang Z & Cao Z (1981) Physicochemical properties of pollen wall protein of *Cucurbita pepo* and *Luffa cylindrica* and its possible role in the recognition reaction. [Chinese] Acta Genetica Sinica 8, 75–83. questionable (viable seeds)

Cyperaceae (Poales) 95: 5700

sedge family = Sauergräser

Monophyletic.

2 subfamilies (AP website 2025):

Mapanioideae 11: 185. 2 tribes.

Cyperoideae (incl. Rhynchosporoideae) 84: 5500. 22 tribes.

Cyperoideae 84: 5500. **1 IT**

22 tribes, e.g.:
Bolboschoeneae 1: 15 (*Bolboschoenus*)
Cariceae 1: 2300 (*Carex*, incl. *Kobresia*°, *Vignea*°). 6 subgenera.
Cypereae 8: 1132 (*Cyperus 961*, …).
Dulichieae 3: 5 (*Blysmus 3*, *Dulichium*, …).
Rhynchosporeae 1: 400 (*Rhynchospora*).
Schoenoplecteae 2: 18 (*Schoenoplectus* 17, …).
Scirpeae 6: 73 (*Eriophorum 18*, *Scirpus 47*, …).

Probably **basic type Cyperaceae Cyperoideae tribe Cariceae** (*Carex*) (1: 2300). The monogeneric tribe was formerly split into a host of genera, which now are all included in the sole genus *Carex*, one of the largest plant genera at all. *Carex* species readily cross and are connected by some 200 or more known interspecific hybrids.

IS: IPNI 2013: *Carex 198 IS!*, *Cyperus 13 IS*, *Eleocharis 2 IS*, *Eriophorum 11 IS*, *Fimbristylis 1 IS*, *Kobresia° 1*, *Rhynchospora 1 IS*, *Schoenoplectiella°* (= *Schoenoplectus* p. p.) *9 IS*, *Schoenoplectus 9*, *Schoenus 2 IS*, *Scirpus* s. l. *11 IS*, *Trichophorum 1 IS*, *Uncinia 1 IS*, *Vignea° 3 IS* (= *Carex* p. p.

Bolboschoenus × *Schoenoplectus* **IT** Bolboschoeneae × Schoenoplecteae (→ × *Bolboschoenoplectus* Tatanov 2007 Novosti Sist. Vyssh. Rast. 39: 154) IPNI 2011, de.wikipedia 2026 (× *B. mariqueter* nat hyb. China), POWO 2026

~~*„Cyperus dentatus" × Rhynchospora capitellata* **IT**~~ Cypereae × Rhynchosporeae (→ *Cyperus* × *weatherbianus* Fernald 1918 Rhodora 20 (239): 190–191) Fernald 1918, according to Raymond 1962 *Cyperus dentatus* must be replaced by *Dulichium arundinaceum*.

Dulichium arundinaceum × *Rhynchospora capitellata* **IT** Dulichieae × Rhynchosporeae (nat. hyb.) (→ „× *Raymondiella*" Boivin 1973 in Taxon 22, 278 „verosimiliter hybridus inter *Dulichium* et *Rhynchospora* secundum M. Raymond 1962 in Rhodora 64, 349–350", name not in accordance with Art. H7 of the code) IK 1981. POWO 2026 (no entry, cf. https://gobotany.nativeplanttrust.org/species/dulichium/arundinaceum/. Questionable.

References:

Fernald ML (1918) An intergeneric hybrid in the Cyperaceae. Rhodora 20, 189–191. http://www.biodiversitylibrary.org/item/14491#194
Raymond (1962) A note on × *Cyperus weatherbianus*. Rhodora 64 (760), 349–350.
Tarasevich VF (1992) Palynological study of the genus *Carex* (Cyperaceae). [Russian] Botanicheskii Zhurnal (St. Petersburg) 77 (11), 4–15.