

Transfer of *Cyphomandra* (*Solanaceae*) and its species to *Solanum*

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Summary

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Data from recent molecular studies demonstrate that the genus *Cyphomandra* is nested within *Solanum*. Recognition of *Cyphomandra* as a separate genus therefore is not tenable unless *Solanum* is broken up into smaller monophyletic units. All *Cyphomandra* species are transferred to *Solanum*, necessitating twelve new names and twelve new combinations.

The genus *Cyphomandra* Mart. ex Sendtn. (*Solanaceae*) includes about 35 species of neotropical shrubs and small trees (Bohs, 1994). Within the *Solanaceae*, *Cyphomandra* belongs to the subfamily *Solanoideae* and tribe *Solaneae*, characterized by flattened seeds with curved embryos and abundant endosperm, valvate, induplicate, or plicate corolla aestivation, and filaments inserted near the base of the anthers (D'Arcy, 1979; Hunziker, 1979). The *Solaneae* are the largest and least understood tribe in the *Solanoideae*, in part because they include the large and poorly known genus *Solanum*. Generic boundaries and phylogenetic relationships in the *Solaneae* have not been clear. *Cyphomandra* is no exception; its generic circumscription and relationship to other solanaceous taxa have been sources of confusion for many years.

Cyphomandra is one of five solanaceous genera (*Cyphomandra*, *Lycianthes* (Dunal) Hassl., *Lycopersicon* Mill., *Solanum* L., and *Triguera* Cav.) with poricidal anther dehiscence (D'Arcy, 1991). Among these taxa, *Cyphomandra* is most closely related to *Solanum* and *Lycopersicon*. It is distinguished from other *Solanaceae* by the presence of an enlarged connective region on the adaxial surface of the anthers and by its very large chromosomes and large amounts of DNA (Bernardello & Anderson, 1990; Bohs, 1989, 1994; Pringle & Murray, 1991; Roe, 1967; Sendtner, 1845). Although these characters may define *Cyphomandra* as a monophyletic group, the phylogenetic relationships of *Cyphomandra*, *Solanum*, and *Lycopersicon* have been elucidated only recently. Molecular systematic studies using chloroplast DNA restriction site variation and sequence data have established that *Cyphomandra* and *Lycopersicon* are nested within *Solanum* (Bohs & Olmstead, 1995; Olmstead & Palmer, 1992; Spooner & al., 1993). Several *Lycopersicon* species were either originally described under *Solanum* or were transferred to *Solanum* prior to Spooner & al.'s study; the remaining transfers to *Solanum* were made in their 1993 paper. *Cyphomandra* is thus the only large group of species that remains to be transferred to *Solanum*, and these transfers are made below.

An alternative strategy is to break *Solanum* into smaller monophyletic units, each perhaps recognized at the rank of genus. Unfortunately, much remains to be elucidated about *Solanum* systematics and phylogeny before this course can be followed. An active community of *Solanaceae* systematists is currently at work on this problem.

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The following list gives the correct names in *Solanum* for all species of *Cyphomandra* (listed in the alphabetical sequence of their epithets under the latter genus). Brief statements explain the etymology of epithets in substitute names. Complete synonymies are given in Bohs (1994).

Solanum roseum Bohs, **nom. nov.** ≡ *Cyphomandra acuminata* Rusby in Bull. Torrey Bot. Club 26: 196. 1899 (non *S. acuminatum* Ruiz & Pav. 1799).

The epithet (Latin *roseus*) refers to the pinkish hue of the corolla.

Solanum exiguum Bohs, **nom. nov.** ≡ *Cyphomandra benensis* Britton in Bull. Torrey Bot. Club 26: 196. 1899 (non *S. beniense* De Wild. 1922).

Transfer of the epithet *benensis* to *Solanum* was deemed to conflict with the existing name *S. beniense* De Wild. (Art. 53.4 of the *Code*, Greuter & al., 1994; Nicolson, 1993), especially since the Britton name was based on the Río Beni, and the epithet would be more properly *beniensis*. The new epithet, from Latin *exiguus*, refers to the diminutive size of this species.

Solanum betaceum Cav. in Anales Hist. Nat. 1: 44. 1799 ≡ *Cyphomandra betacea* (Cav.) Sendtn.

Solanum cajanumense Kunth in Humboldt & al., Nov. Gen. Sp. 2: 37. 1818 ≡ *Cyphomandra cajanumensis* (Kunth) Walp.

Solanum latiflorum Bohs, **nom. nov.** ≡ *Cyphomandra calycina* Sendtn. in Flora 28: 167. 1845 (non *S. calicinum* Dunal in Poir. 1814, nec *S. calycinum* Moc. & Sessé ex Dunal 1816, nec *S. calycinum* Nees 1834).

Solanum latiflorum was cited by Dunal (1852) as a synonym of *Cyphomandra calycina* var. *rufescens* and therefore was not validly published under Art. 34.1 of the *Code* (Greuter & al., 1994). It is taken up here as a new name for *C. calycina*.

Solanum corymbiflorum (Sendtn.) Bohs, **comb. nov.** ≡ *Cyphomandra corymbiflora* Sendtn. in Flora 28: 174. 1845.

Solanum diploconos (Mart.) Bohs, **comb. nov.** ≡ *Witheringia diploconos* Mart., Nov. Gen. Sp. Pl. 3: 76. 1829 ≡ *Cyphomandra diploconos* (Mart.) Sendtn.

Solanum melissarum Bohs, **nom. nov.** ≡ *Witheringia divaricata* Mart., Nov. Gen. Sp. Pl. 3: 75. 1829 ≡ *Cyphomandra divaricata* (Mart.) Sendtn. (non *S. divaricatum* M. Martens & Galeotti 1845).

The epithet is derived from the Greek μελισσα, or bee, in honour of the elegant work by M. Sazima, S. Vogel, and colleagues on pollination of this species by male euglossine bees.

Solanum diversifolium Dunal, Solan. Syn.: 8. 1816 ≡ *Cyphomandra diversifolia* (Dunal) Bitter.

Solanum fortunense Bohs, **nom. nov.** ≡ *Cyphomandra dolichocarpa* Bitter in Rept. Spec. Nov. Regni Veg. 17: 327. 1921 (non *S. dolichocarpum* Bitter 1913).

The epithet commemorates one of the localities where the author has collected this species: Fortuna Dam, Prov. Chiriquí, Panamá.

Solanum endopogon (Bitter) Bohs, **comb. nov.** ≡ *Cyphomandra endopogon* Bitter in Bot. Jahrb. Syst. 54, Beibl. 119: 16. 1916.

Solanum cacosmum Bohs, **nom. nov.** ≡ *Cyphomandra foetida* Bohs in Syst. Bot. 13: 268. 1988 (non *S. foetidum* Rottb. 1778, nec *S. foetidum* Ruiz & Pav. 1799).

The epithet, from the Greek κάκοσμος, “stinking”, describes the foul odour of this plant noted by many collectors.

Solanum oxyphyllum C. V. Morton in Contr. U.S. Natl. Herb. 29: 49. 1944 (non *Cyphomandra oxyphylla* Dunal 1852) ≡ *Cyphomandra fragilis* Bohs.

Solanum circinatum Bohs, **nom. nov.** ≡ *Pionandra hartwegii* Miers in London J. Bot. 4: 363. 1845 ≡ *Cyphomandra hartwegii* (Miers) Walp. (non *S. hartwegii* Benth. 1840).

The epithet (Latin *circinatus*) describes the long coiled inflorescence of this species.

Solanum paralum Bohs, **nom. nov.** ≡ *Cyphomandra heterophylla* Taub. in Bot. Jahrb. Syst. 15, Beibl. 38: 16. 1893 (non *S. heterophyllum* Lam. 1794).

The epithet is derived from the Greek παράλος, “near the sea”, in reference to the seaside habitat of this species.

Solanum fallax Bohs, **nom. nov.** ≡ *Cyphomandra hypomalaca* Bitter in Repert. Spec. Nov. Regni Veg. 17: 346. 1921 (non *S. hypomalacum* (Bitter) C. V. Morton 1944).

The epithet (Latin *fallax* = false) was chosen because this species actually belongs in *Solanum* sect. *Cyphomandropsis* Bitter rather than in *Cyphomandra*.

Solanum obliquum Ruiz & Pav., Fl. Peruv. 2: 35. 1799 ≡ *Cyphomandra obliqua* (Ruiz & Pav.) Sendtn.

Solanum proteanthum Bohs, **nom. nov.** ≡ *Cyphomandra oblongifolia* Bohs in Syst. Bot. 13: 271. 1988 (non *S. oblongifolium* Dunal 1816).

The epithet is taken from Proteus, a figure in Greek mythology capable of assuming different forms. This is in reference to the diversity in floral morphology displayed by this species throughout its range (Bohs, 1988, 1994).

Solanum ovum-fringillae (Dunal) Bohs, **comb. nov.** ≡ *Cyphomandra ovum-fringillae* Dunal in Candolle, Prodr. 13(1): 394. 1852.

Solanum pendulum Ruiz & Pav., Fl. Peruv. 2: 39. 1799 ≡ *Cyphomandra pendula* (Ruiz & Pav.) Sendtn.

Solanum calidum Bohs, **nom. nov.** ≡ *Cyphomandra pilosa* Bohs in Syst. Bot. 13: 265. 1988 (non *S. pilosum* Raf. 1840).

The epithet (Latin *calidus*, meaning hot) describes the hot lowland habitats occupied by this species.

Solanum pinetorum (L. B. Sm. & Downs) Bohs, **comb. nov.** \equiv *Cyphomandra pinetorum* L. B. Sm. & Downs in Phytologia 10: 436. 1964.

Solanum premnifolium (Miers) Bohs, **comb. nov.** \equiv *Pionandra premnifolia* Miers in London J. Bot. 4: 360. 1845 \equiv *Cyphomandra premnifolia* (Miers) Dunal.

Dunal (1852) cited "*Solanum prenaefolium*" as a synonym under *Cyphomandra premnifolia* (Miers) Dunal. According to Art. 34.1 of the Code (Greuter & al., 1994), *S. premnifolium* was not thereby validly published.

Solanum rojasianum (Standl. & Steyerl.) Bohs, **comb. nov.** \equiv *Cyphomandra rojasiana* Standl. & Steyerl. in Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 377. 1940.

Solanum sciadostylis (Sendtn.) Bohs, **comb. nov.** \equiv *Cyphomandra sciadostylis* Sendtn. in Flora 28: 170. 1845.

Solanum sibundoyense (Bohs) Bohs, **comb. nov.** \equiv *Cyphomandra sibundoyensis* Bohs in Syst. Bot. 13: 273. 1988.

Solanum occultum Bohs, **nom. nov.** \equiv *Cyphomandra stellata* Bohs in Fl. Neotrop. Monogr. 63: 134. 1994 (non *S. stellatum* Jacq. 1789, nec *S. stellatum* Moench 1794, nec *S. stellatum* Ruiz & Pav. 1799).

The epithet (Latin *occultus* = hidden) refers to the fact that plants of this species, being intermediate in morphology between *Cyphomandra endopogon* and *C. hartwegii*, were identified as either *C. endopogon* or *C. hartwegii* until *C. stellata* was described (Bohs, 1994).

Solanum sycocarpum Mart. & Sendtn. in Flora 24(2), Beibl. 6: 85. 1841 \equiv *Cyphomandra sycocarpa* (Mart. & Sendtn.) Sendtn.

Solanum tegore Aubl., Hist. Pl. Guiane: 212. 1775 \equiv *Cyphomandra tegore* (Aubl.) Walp.

Solanum tenuisetosum (Bitter) Bohs, **comb. nov.** \equiv *Cyphomandra tenuisetosa* Bitter in Repert. Spec. Nov. Regni Veg. 17: 352. 1921.

Solanum tobagense (Sandwith) Bohs, **comb. nov.** \equiv *Cyphomandra tobagensis* Sandw. in Kew Bull. 9: 370. 1938.

Solanum unilobum (Rusby) Bohs, **comb. nov.** \equiv *Cyphomandra uniloba* Rusby in Mem. Torrey Bot. Club 6: 90. 1896.

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