

# *Leuenbergeria*, a new genus in Cactaceae

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As stated by Leuenberger (1987), specialist in the genus *Pereskia* and allies, the first author to understand the genus was Schumann (1898), who separated the species of *Opuntia*, *Pereskiosis* and *Maihuenia* which had previously been included in *Pereskia* (Rümppler, 1886, Salm-Dyck, 1850).

*Pereskia* was considered likely to contain the most ancestral taxa of the family by Schumann (1890) as well as Buxbaum (1969). The most complete work made on the genus *Pereskia* is that of Leuenberger (1987). But since, it has been discovered that *Pereskia* is a paraphyletic genus.

The analyses of Nyffeler (2002) showed that *Pereskia* is basal within the Cactaceae, but does not form a monophyletic group.

The molecular analyses of Butterworth & Wallace (2005) defined *Pereskia* as paraphyletic. Edwards *et al.* (2005) produced a work based on the analyses of DNA sequences and also found that *Pereskia* is paraphyletic to the rest of Cactaceae. For example, the only species living in Costa Rica, *Pereskia lychnidiflora*, is very distant from the type species (*P. aculeata*), in a basal clade that would oblige us to split the genus into two.

The molecular study of Crozier (2005) suggested that the species of *Pereskia* seem to have diverged very early and quickly in the evolution of the family. She observed significant differences, but in the absence of molecular evidence, maintained the Opuntioideae and Pereskioideae sub-families.

Edwards & Donoghue (2006) collected and studied seven species of *Pereskia* included within both clades, by adding climatic and physiological data. Hunt *et al.* (The New Cactus Lexicon, 2006) reflected both groups which seemed coherent to them, and proposed a classification on this basis.

Marlon Machado (2007) commented about *Pereskia* that it is not a single genus, but formed by two different groups of species which arise from the two oldest lineages in the evolution of the family which have morphological and anatomical characters enabling the division of *Pereskia* in two different groups. But if one of them is already named as *Pereskia*, the other one has neither a genus name, nor a name of a sub-family...

In 2008, Butterworth & Edwards confirmed that *Pereskia* is paraphyletic, and Gorelick (2008) pointed out that « *However, apparent parphyly of Pereskia, with Maihuenia, Opuntioideae, and Cactoideae embedded within it, continues to confound.* ». Nyffeler *et al.* (2008), then Nyffeler & Egli (2010) showed in their work that, *Pereskia* is paraphyletic and could be divided, on a molecular basis, into a « Northern » clade (from northern South America to Mexico) and a « Southern » clade (tropical and subtropical South America from Brazil southwards). They clarify that the « Southern » clade has a delayed bark formation and a persistent epidermis with stomata on the stem, characteristics which are also shared with other cacti: Opuntioideae, Cactoideae, and *Maihuenia*, although this last one would have lost them afterwards. It also delays in making bark, while the « Northern » clade is a little bit like non-succulent plants, making bark (periderm) very early, and does not have stomata on the stem.

Bárceñas *et al.* (2011) confirmed both clades in their study, did not take much account of the subject with regard to previous works but noted, however, that the analysis of Edwards *et al.* (2005) and his hypothesis of family relationships, notably with *P. lychnidiflora*, is the the most serious approach until now.

The genus *Pereskia s.s.* (« Southern species ») is considered at present to be a good genus, but we await another and new genus for the “Northern species”. It is to be noted that *Pereskia aculeata* distorts a little bit the geographic data because it is grown and naturalized almost everywhere in tropical and subtropical countries. *Pereskia aureiflora* is a case of disjunction: in fact, the species is connected, in spite of the distance of separation (Venezuela - S.E. Brazil) to *Pereskia guamacho* (Butterworth & Wallace, 2005). They are the only two species of the group with yellow flowers.

## ***Leuenbergeria* J. Lodé gen. nov. 2013**

### • DIAGNOSIS

*Pereskia affinis, habitu arboresco, diluculo valde cortice fabricatorius, et non habet stomata in caule.*

### • ETYMOLOGY

Genus dedicated to the Swiss national Beat Ernst Leuenberger (1946-2010), curator of the Berlin-Dahlem Botanical garden tropical collections, specialist of the Pereskioideae, and prematurely departed.

### • TYPE

*Pereskia quisqueyana* Liogier 1980, Phytología, 47.3 (183). Dom. Rep., La Altagracia (“La Romana”), Bayahibe, 9-07-1977, Liogier 27032 (Hol. : UPR 5114; IT: NY, US).

*Frutex 3-4 m altus, glaber; truncus usque 10 cm diam; rami hornotini in sicco striati pallide brunnei 3-4 ram diam; areolae paucae tomentosae, aculei pauci usque 2 cm longi, recti, fusci; folia elliptica vel obovato-elliptica vel oblanceolata, 4-6 cm longa, 1-2 cm lata, apice et basi acuminata, nervo medio supra obsoleto, subtus praesertim ad basim prominulo, minutissime glanduloso-punctata margine integra plana, in sicco membranacea; flores axillares solitarii; ovarium turbinatum, 8 mm longum et latum, areolis paucis non acultatis obsitum, truncatum; petala roseo-rubra usque 2.2 cm longa, glabra, apice valde emarginata. Fructus ignotus.*

→ at present 8 recognized species :

## ***Leuenbergeria aureiflora* (Ritter) J. Lodé comb. nov.**

**Basionym:** *Pereskia aureiflora* F. Ritter 1979, Kakteen in Südamerika 1: 22 (1979) Selbstverlag, Spangenberg.

**Type:** Itaobim, Minas Gerais, Brasil, Ritter 1413. **Lectotype** : Taylor & Zappi 2004, Cacti of Eastern Brazil.

## ***Leuenbergeria bleo* (Kunth) J. Lodé comb. nov.**

**Basionym:** *Cactus bleo* Kunth 1823, Nov. Gen. Sp. 6: 69, Humboldt, Bonpland & Kunth.

**Type:** Badillas, Río Magdalena, Colombia, May 1805, Humboldt & Bonpland 1546.

## ***Leuenbergeria guamacho* (Weber) J. Lodé comb. nov.**

**Basionym:** *Pereskia guamacho* Weber 1898, Dict. Hort. 938, Bois.

**Type:** Orinoco Basin. **Neotype** : Leuenberger 1986, MNYBG 41: 85.

***Leuenbergeria lychnidiflora* (D.C.) J. Lodé comb. nov.**

**Basionym:** *Pereskia lychnidiflora* D.C. 1828, Mém. Mus. Nat. Hist. Nat. 17: 75, t.18

**Type:** Drawing of “*Cactus fimbriatus*” in Mociño, Fl. Mex. ined. N°1689.

***Leuenbergeria marcanoi* (Areces Mallea) J. Lodé comb. nov.**

**Basionym:** *Pereskia marcanoi* Areces Mallea 1992, Britt. 44(4) 423-428 (ill.).

**Type:** S-W Dom. Rep., semi deciduous forest, circa 500 m in alt., Areces Mallea 5823 (JBSD).

***Leuenbergeria portulacifolia* (L.) J. Lodé comb. nov.**

**Basionym:** *Cactus portulacifolius* L. 1753, Sp. 469.

**Type:** Haïti, le Fond Parisien, Cul de Sac, Plumier 1758, Pl. amer. t. 197, fig.1 (drawing).

***Leuenbergeria quisqueyana* (Liogier) J. Lodé comb. nov.**

**Basionym:** *Pereskia quisqueyana* Liogier 1980, Phytología, 47.3 (183).

**Type:** Dom. Rep., La Altigracia (“La Romana”), Bayahibe, 9-07-1977, Liogier 27032 (Hol. UPR).

***Leuenbergeria zinniiflora* (D.C.) J. Lodé comb. nov.**

**Basionym:** *Pereskia zinniiflora* D.C. 1828, Mém. Mus. Nat. Hist. Nat. 17: 75, t.17

**Type:** Drawing of “*Cactus zinniaeflorus*” in Mociño, Fl. Mex. ined. N°1012.

**• DISTRIBUTION**

**Antilles (Bonaire), Brazil (Bahia, Minas Gerais), Colombia (Bolívar), Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala (Chiquimula, El Progreso, Zacapa), Haïti, Honduras, Mexico, Nicaragua, Panama, Venezuela (Bolívar).**

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