



*Descole*

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*Trichia*

*Trichia sp. in planta + A. fl. abstrigens + B. a. corte longitudinal de la misma + C. d. areola + D. a. semilla + E. a. detalle de la misma + 40.*

# *Fraileae* B. P. R. Chéron, Tribus nova

by Brice P. R. CHÉRON

mail: brice.cheron@laposte.net

Summary : the aim of this article is to establish the new tribe of the *Fraileae*.

Keywords : *Frailea*, *Fraileae*, tribe, systematic.

Résumé : le but de cet article est de fonder la nouvelle tribu des *Fraileae*.

Mots-clés : *Frailea*, *Fraileae*, tribu, systématique.

## I°) Typification

### *Fraileae* B. P. R. Chéron, Tribus nova

Typus: *Frailea* N. L. Britton & J. N. Rose (1922) in BRITTON Nathaniel L. & ROSE Joseph N. (1922): The Cactaceae. Volume III, p. 208-211.

Typus speciei identicus quam ejus generis *Frailea* : *Frailea cataphracta* (E. Dams) N. L. Britton & J. N. Rose (1922). Basionymum : *Echinocactus cataphractus* E. Dams (1904) in DAMS Erich (1904): Echinocactus cataphractus n. sp. Monatschrift für Kakteenkunde, Vierzehnter Band [vol. 14] : p. 172-173.

## II°) Diagnosis

*Fraileae* B. P. R. Chéron, tribus mono-generica cujus genus typicum *Frailea* N. L. Britton & J. N. Rose (1922) est. Insigniter qualitatem monophyleticam distinguenda.

## III°) Description

*Fraileae* B. P. R. Chéron is a **monogeneric and monophyletic tribe**. Its essential, diagnostic characteristics are therefore the same as those established for the genus *Frailea* (BRITTON & ROSE 1922) with the addition of differences that were brought out by studying and improving knowledge on *Frailea* species for now almost a century :

- green, succulent, leafless and perennial plants,
- **always dwarf, minute** plants (exceptionally : bigger and larger by trophic and hydric excesses up to five centimetres in diameter),
- **mostly solitary** or caespitose plants, with a semi-cryptic habit,

- **plants forming globular bodies (stems)** or less usually narrowly cylindrical (or becoming as such slowly by ageing), with **umbilicate, depressed apex** or less often simply flat,
- costae and tubercles with geometrical and regular arrangements, the **intercostal rows** of which are **poorly marked**, not exceeding 15 % of the radius of the stem, spination excluded,
- **tuberous or napiform roots, always massive** (root system weight  $\geq$  stem weight) and **retractile**,
- **spines small or even very small**, scabrid, linear or slightly curved, (1)3-5(10) mm long, bundled by 4 to 18 per areole, most of the time flattened, sometimes with 1-4 erect central spines, finally only weakly harmful,
- actinomorphic flowers **always of a clear yellow**, pale in most of the occurrences (except in cases of hyperchromy, albinism and in cultivars), broad and conspicuous when compared to the bodies of the plants which produce them, **chasmogamous (heterogamy) or cleistogamous (autogamy)**,
- receptacle (upper part of the gynoecium) of yellow colour, yellow-green or more rarely tinged red during anthesis,
- **inflorescence almost always uniflorous** or multiflorous but then in succession during anthesis, **arising apically** (which can become quickly lopsided to allow space for the next flower),
- ovaries then fruits with an **always densely woolly and aciculated hypanthium** (the ratio tomentum / aciclesis is however variable),
- **seeds galeiform** (helmet-shaped), **large** when compared to the size of fruits, from 1 to 1,6 mm long, with smooth or spinulescent testa (especially on edges), glossy, with a cellular scalariform structure,
- hilum very broad and marked, concave, surrounded by a margin histologically derived from the testa,
- **dissemination by myrmecochory** or eventually by hydrochory.

The chorology of the tribe merges with the one of the genus it contains : in **South America only**, where it is known with certainty in Argentina (N & N-E), Bolivia (S-E), Brazil (S-W), Paraguay and Uruguay, from 20 m to 900 m in altitude.

Being based on *Frailea* (BRITTON & ROSE 1922), the etymology of *Fraileae* B. P. R. Chéron is the same. The suffix *-ae* is exclusive to the taxonomic rank of the tribe, accordingly to article 19.3 of the International Code of Nomenclature (Melbourne Code) (MAC NEILL & *al.* 2012).

Since Franz Buxbaum's major publication in 1958 (BUXBAUM 1958), almost every botanist and systematist having worked on *Cactaceae* A. L. de Jussieu (1789) *nomen conservandum* (WIERSEMA & al. 2015), integrated the genus *Frailea* into the tribe *Notocacteae* F. Buxbaum (1958) (ENDLER & BUXBAUM 1979, GIBSON & NOBEL 1986, BARTHLOTT & HUNT 1993, ANDERSON 2001, TAKHTAJAN 2009, ANDERSON & EGGLI 2011). Today we know, thanks to phylogenetic studies, especially those of Reto Nyffeler, that this is false (NYFFELER 2002, CROZIER 2005, NYFFELER & EGGLI 2010, HERNÁNDEZ-HERNÁNDEZ & al. 2011, LODÉ 2015) because *Frailea* proceeds from a clearly independent evolutionary lineage, even if there are evolutionary morphological similarities with other genera which are confusing.

Consequently, the following partial synonymy appears :

*Fraileae* B. P. R. Chéron,

synonym: *Notocacteae* F. Buxbaum (1958)—*pro parte et typo excluso*.

This means that I still recognise the validity of the tribe *Notocacteae*, but this latter cannot and must not include the genus *Frailea* which now belongs to *Fraileae* B. P. R. Chéron.

To date, the tribe *Fraileae* B. P. R. Chéron is understood as included in the subfamily *Cactoideae*\*, which is of course itself nested in the family *Cactaceae*. This tribe includes a single genus (monogeneric tribe): *Frailea* N. L. Britton & J. N. Rose (1922).

Especially and to keep it monophyletic, this tribe excludes *de facto* the genera *Astrophytum* C. Lemaire (1839), *Blossfeldia* E. Werdermann (1937), *Copiapoa* N. L. Britton & J. N. Rose (1922), *Notocactus* (K. M. Schumann) A. V. Frič (1928) and *Parodia* C. L. Spegazzini (1923) to which genus *Frailea* was subservient, partly merged, or even put into various synonymy levels in the past (BARTHLOTT 1988, EGGLI & NYFFELER 1998, BRUMMITT 2000, HALDA & MALINA 2005).

Thus, we get the following systematic classification:

CACTACEAE  
   └ Cactoideae  
       └ Fraileae  
           └ Frailea.

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\* *Cactoideae* is an *autonymum* (autonyme). It works as explained in article 6.8 of the Melbourne Code.

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