The Genus FRAILEA

by E. W. Putnam

Very little appears in the cactus literature concerning this small but very interesting genus of South American cacti; indeed I have been able to trace only three articles on the subject in recent literature. Two of these are only brief notes from my own pen. the other is a useful and interesting discussion of the genus by Florent Guldemont (see bibliography below). Nevertheless there is widespread interest in this genus and a brief review of the plants together with comments on my own experiences with some of them may be helpful to cactophiles, especially that large majority who do not see the foreign journals and monographs.

Frailea is a modest genus containing perhaps a score of species, all very small plants. The genus was proposed by Britton and Rose in 1922 to include nine species hitherto belonging to Karl Schumann's collective genus *Echinocactus*. The name *Frailea* was coined in honour of Fraile, a curator of cacti in the U.S. Department of Agriculture.

The species themselves have a respectable history as collectors' plants. *Frailea pumila* was first described in 1838 (as *Echinocactus pumilus* Lemaire) and *Fr. gracillima* followed in 1839 (as *Echinocactus gracillimus* Monville ex Lemaire). By the end of the nineteenth century four species were known altogether, *Fr. schilinzkyana* and *Fr. grahliana* having been described by Haage in 1897 and 1899 respectively. By the time Britton and Rose were writing *The Cactaceae* five more names had been added to the list (*Fr. knippeliana*, *Fr. cataphracta*, *Fr. pygmaea*, *Fr. phaeodisca* and *Fr. pulcherrima*).

Britton and Rose chose *Echinocactus cataphractus* Dams as the type-species of their new genus, re-naming it *Frailea cataphracta*. The next mile-stone of *Frailea* history was 1959, the year in which Curt Backeberg published his six-volume monograph *Die Cactaceae*. During the thirty-seven years which had passed since the appearance of Britton and Rose's work a further six specific names of *Fraileas* had been published, some by Backeberg himself. In *Die Cactaceae* he did a little pruning among the names and reduced some from specific to varietal level, ending with twelve species altogether. Six years later, in his final work, *Das Kakteenlexikon*, completed in 1965, Backeberg extended the list to seventeen species, taking in some recent discoveries. Brisk activity by collectors in South America in the last two or three years has brought further new species to our knowledge and the present tally for the genus is around twenty distinct species and about half-a-dozen varieties.

The current list of species is not lengthy and may be useful to enthusiasts:—

Frailea alacriportana Backbg. & Voll.
carminifilamentosa Kilian
carminifilamentosa v. *winkelmanniana* Kilian
castanea Backbg.
cataphracta (Dams) Br. & R.
cataphractoides Backbg.
chiquitana Card.
chrysacantha Hrabe
colombiana (Werd.) Backbg.
gracillima (Monv. ex Lem.) Br. & R.
grahliana (Hge. jr.) Br. & R.
knippeliana (Quehl) Br. & R.
pseudopulcherrima Borg ex Ito
pulcherrima (Arech.) Backbg.
pullispina Backbg.
pullispina v. *atrispina* Backbg.
pullispina v. *centrispina* Backbg.
pumila (Lem.) Br. & R.
pygmaea (Speg.) Br. & R.
pygmaea v. *atrofusca* Backbg.
pygmaea v. *aurea* (Backbg.) Backbg.
pygmaea v. *dadakii* (Frič.) Backbg.
pygmaea v. *phaeodisca* (Speg.) Ito
schilinzkyana (Hge. jr.) Br. & R.
uhligiana Backbg.

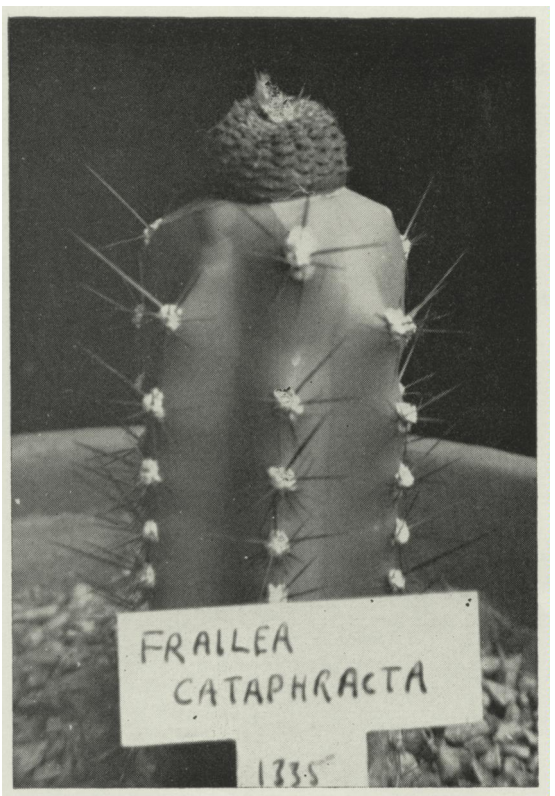
Among the most recent discoveries is *Frailea horstii*, but I have not yet seen the authoritative publication of this name.

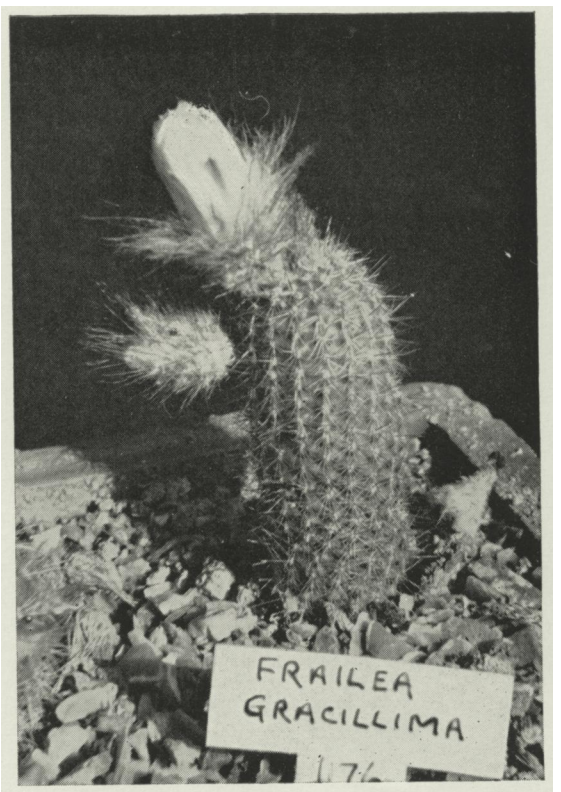
Names omitted from the above list are those reduced to synonymy or to varietal level, namely *asterioides* (=*castanea*), *aurea* (=*pygmaea* v. *aurea*), *phaeodisca* (=*pygmaea* v. *phaeodisca*) and *pseudograhliana* Frič & Kreuzinger nom.nud., a name in common use which has so far not been validly published.

The *Frailea* habitats in South America extend through Argentina, Paraguay, Uruguay, Bolivia and south-eastern Brazil. *Fr. colombiana* is stated to come from Colombia, the location being given as "Dagua, on the Buenaventura-Cali railway, at 1500-1800 metres". Some doubt has been cast on this recently and it certainly seems surprising that this one species of *Frailea* should grow in an area so remote from the rest of the genus and separated from them by the vast Amazonian forest. Errors in locality data for cacti are not unknown in the literature, but until *Frailea colombiana* is re-collected in Colombia or elsewhere the doubts cannot be resolved.

The genus has given rise to few taxonomic disputes, as far as I know, beyond the Buxbaum-Backeberg controversy over the relationship of *Frailea* to *Astrophytum*. Backeberg's forceful views on this are given in *Die Cactaceae* (Vol. III p. 1655), where he scornfully rejects the idea that the two genera are closely related. This is the kind of dispute in which the wise layman stays in his foxhole until the dust has settled!

In any genus containing more than one plant the experts will seek out further subdivisions in which to pigeon-hole the species, and *Frailea* is no exception. Such subdivisions can be useful to growers in various ways as they will form the basis of an identification key as well as quite often giving clues on cultivation needs.





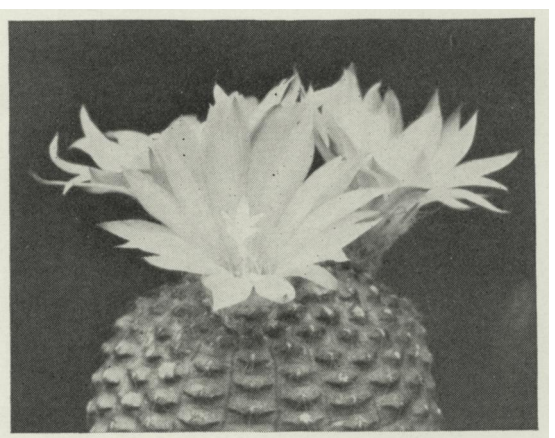
Above, left: FRAILEA CATAPHRACTA, grafted plant from a Dutch nursery.

Above, right: FRAILEA GRACILLIMA with flower and seed-capsule.

Right: FRAILEA CATAPHRACTA.

Below, left: FRAILEA PULCHERRIMA.

Below, right: FRAILEA PYGMAEA.



Backeberg placed the twelve species he recognised in *Die Cactaceae* in two principal groups: those with and those without distinct tubercles. The latter group contains only *Fr. castanea*. The tubercled group he further subdivided into three sections according to the form of the stem. The Backeberg classification is summarised below.

With distinct tubercles			*Without distinct tubercles*
Stem cylindrical	*Stem semi-cylindrical*	*Stem globular*	
Fr. alacriportana *Fr. gracillima* *Fr. knippeliana*	*Fr. chiquitana*	*Fr. cataphracta* *Fr. colombiana* *Fr. grahliana* *Fr. pulcherrima* *Fr. pumila* *Fr. pygmaea* *Fr. schilinzkyana*	*Fr. castanea*

All the species known to me have yellow flowers. The buds are produced in clusters at the crown of the plant between May and August in my collection. Many more buds are seen than blooms, but very nearly every bud yields a capsule full of ripe seed within a few weeks. This phenomenon seems to be unique to *Frailea* among the cacti, though it is known for other plants. Fertilisation takes place readily within the unopened bud and one can safely accept that the seed so produced is true to its parent. This "secret" fertilisation is known as cleistogamy. One could wish that cleistogamy were more common among the cacti so that the raising of authentic species from home-grown seed would present no difficulty.

Although my plants exhibit the cleistogamous habit freely, there is no lack of blooms. Each of my plants usually manages to open a few flowers during each season. Contrary to what has often been said about *Fraileas*, I do not find that my plants limit their "opening time" to midday on the brightest and hottest days. Flowers are seen quite often in the summer evenings and sometimes open on quite overcast days. It is always foolhardy to generalise dogmatically about plant behaviour; I am never at a loss for examples of "irregular" behaviour among plants in my own collection, and hear of many more from other collectors. The South American cacti seem to delight in confounding us by unexpected habits of growth—I have *Neoporterias* that flower in spring or autumn as the fancy takes them and a *Parodia* that flowers on and off all the year round and has done so for years, often delighting us with a display of flowers for Christmas, Easter, Whitsun and the August Bank Holiday in the same year.

My collection of *Fraileas* is not complete, but I have representatives of the main types. I have experienced very little difficulty in cultivation: *Fr. colombiana* seems indestructible and quickly makes an attractive many-headed clump. Other globular species are equally easy and several form clumps readily if given the encouragement of being planted in wide pans. I would strongly advise against the use of small clay pots for *Frailea* seedlings. Young plants do best if planted out in pans with other plants—this advice applies equally to other young cacti. The tiny clay pot becomes a constricting, overheated prison for cactus seedlings in the summer months and dries out far too quickly.

The columnar *Fr. gracillima* is less easy than the globular species, in my experience. My plants grow only very slowly and need watching as they lose their roots rather easily if over-or under-watered. It is possible that this species is sensitive to soil pH and that my compost is insufficiently acidic for it.

I grow my own plants in full light, but other successful growers favour some shading. Each grower must discover for himself what are the best conditions for his own plants but, having discovered, for example, that one's *Fraileas* grow and flower well in the shade, do not assume that they will not flourish in full sun too. My plants revel in the sunlight and not one has ever suffered from scorching even in the fiercest heatwaves.

The fact that *Fraileas* will grow and flower in shade should be of interest to those who have no greenhouse. The genus would seem to be ideally suited to windowsill cultivation—a quite ordinary windowsill would accommodate the entire genus comfortably if one became sufficiently interested in these attractive little cacti.

The nearest genus to *Frailea* seems to be *Blossfeldia*, comprising even fewer species (two or three) which are smaller still and are in fact the smallest of all cacti. *Blossfeldias* have received much more publicity than *Fraileas* and appear regularly at cactus shows as grafts on Cerei. I have yet to see a *Blossfeldia* on its own roots, other than the extremely short-lived seedlings I have raised from time to time. I think *Frailea* has more to offer the collector than the grafted *Blossfeldias* which have been rudely but justly described as "frog-spawn on a stick" by Mr. G. M. Taylor. I believe that *Blossfeldia* may also be cleistogamous, like *Frailea*; if so *Frailea* is not strictly unique in possessing this habit.

As a footnote to an earlier article on *Frailea castanea* (*Journal* March 1968) I can report good results from the seed harvested from my plant. About 120 seeds were collected and portions were given to several friends at home and abroad. From a sowing of twelve seeds one recipient has raised seven plants, and from fifteen seeds sown by myself eleven sturdy seedlings have been obtained.

Since completing this article and passing it to the Editor I have learned that Dr. Cardenas has reported in Cactaceas y Suculentas Mexicanas *XII, (3), 1967 on a survey of the alleged habitat of* Frailea colombiana *in Colombia by himself and a party of botanists. In a careful search of the small and very interesting cactus habitat at Lobo Guerrero on the Buenaventura-Cali railway, no trace of* Frailea colombiana *was found. Dr. Cardenas is of the opinion that* Frailea chiquitana, *from Chiquitos, Bolivia, is in fact the most northerly member of the genus.—E.W.P.*

Bibliography

C. Backeberg: "Die Cactaceae" Vol. III, pp 1655-1669
"Das Kakteenlexikon" pp 158-161.

F. Guldemont: *Frailea*; *Dodonaeus*, III, 1, pp 16-19.

E. W. Putnam: *Frailea*; *Dodonaeus*, IV, 1, pp 7-8.
Frailea castanea Nat. Cact. & Succ. J., *23*, (1), 11.

THE EPIPHYTIC PLANT STUDY GROUP

The Epiphytic plant Study Group has issued its second Newsletter. This has contributions from A. J. S. McMillan who gives an alphabetical list of genera of epiphytic plants with notes about some selected species, and further details of ant and plant association in the forests of S. E. Asia and the Amazon Basin.

Clive Innes writes on *Peperomias* and Ron Ginns on "Epiphytes in the West Indies", both from first-hand experience. The Newsletter concludes with a bibliography of articles which have appeared since 1947 in the Journal of the Cactus and Succulent Society of America.

This excellent Newsletter costs 10/6d. per annum (four issues) and together with further details of the Study Group it may be obtained from Mr. A. J. S. McMillan, 5 Oakfield Road, Bristol. BS8 2AJ.