

San Pedro & related *Trichocereus* species

A quote from FRIEDRICH & GLAETZLE may be helpful here, "In their general characters the seeds of all *Echinopsis* species are referable to a type which is common in the subfamily *Cereoidae*. It is thus scarcely possible to recognize with certainty that some unfamiliar seed definitely belongs to *Echinopsis*. Similar seed forms also occur in quite unrelated genera. To this extent, therefore, seed forms are unsuited for determination beyond the genus."

They also stress the importance of subdividing the genus into sections since so many differing plants are being combined.

Does this clear up the confusion or simply add to it? Who volunteers to flip a coin?

Despite his utter failure to prepare vouchers, a comment made in BACKEBERG 1977 springs to mind:

"The choice is clearly between the narrowly conceived genus, or a continuation without demarcations of the "lumping" process, whereby the concept of a "type-species of a genus" loses all meaning. These attempted combinations start an unwarranted series of chain-reactions."

In few cases is this so painfully true as with the devil-may-care expansion of *Echinopsis*.

It is a shame that taxonomists seem to exist at one extreme or another with seemingly no middle ground.

I do not suggest their attempts don't have merit, what I object to is the selective rejection and acceptance of some morphological characteristics over others. Plants vary substantially from individual to individual, which is one reason that morphological classifications have such problems.

Seeds *may* be more consistent but they still can vary. To demonstrate this, one has only to pour a couple dozen *Trichocereus* seeds out of a single seed pack for any given species and carefully compare them using a 10X hand lens.

They also do not always agree with taxonomists (for instance *T. fulvilanus* synonymy with *T. deserticolus*)

Chemotaxonomy suffers the same problems.

However, it is suggested that taxonomists consider utilizing the two and delineating ranges of characteristics for both, to better enable accurate classification and relationship studies. If an attempt was made to better define the parameters of alkaloid expression based on such obvious things as approximate age, available nutrients, plant part and season of sampling, I suspect that most conflicting data would resolve itself nicely.

If additionally combined with actual DNA typing such is now routinely performed on a rudimentary and crude scale for forensics work, surely far more solid sets of standards could be reached and agreed upon.

Nothing new is being proposed, the technology exists for all of this. Some taxonomists fear that the conflicting data they encounter because of local variability will cause only more confusion and upset their previously accepted order.

While quantitative percentages of alkaloids may vary, it is rare that actual qualitative expression is radically changed by environmental differences when seasonal fluctuations and plant part or age variances are taken into account (There are known exceptions.) Alkaloid expression is a product of the enzymes that are present and hence mirrors elements of genetic makeup far better than simple morphology as the synthetic machinery (enzymes) is coded for by the DNA.

(Terpenoids, flavonoids and unusual amino acids are also valuable markers for chemotaxonomy)

Chemotaxonomic work in the genus *Acacia* has not only supported the previously proposed major divisions but has provided new and valuable information about the evolutionary divergence and origin of some of the Pacific species. The previously proposed major divisions were supported not only by chemotaxonomic profiles based on unusual seed amino acids but also in a similar approach evaluating wood flavans.

I do not suggest that *Trichocereus* and *Echinopsis* are not allied, they clearly are, and quite closely, based on their flowers and seeds. I also agree that there is no clear dividing point between them. I would urge more thorough taxonomic work before establishing yet another point of confusion.

On balance, the absorption of *Trichocereus* into *Echinopsis* creates far more problems than it solves.

It can easily be argued that despite those species which do not cleanly fit into one or the other genus when viewed separately, the merger of the genera does not actually contribute anything of true value beyond neatly solving the otherwise problematic placement of these few species.

In my humble opinion, ANY effort to rename or name plants MUST be accompanied by some type of meaningful description or at least a reference to an existing and meaningful description. Lack of this simple but obvious requirement makes a number of HUNT 2000's odd combinations seemingly meaningless.

Regardless of one's views on the actual purpose and function of taxonomy, it should be clear that it is not intended to make classification and identification of plants more abstruse. In no other branch of science would such casual to shoddy referencing be tolerated.

While on the subject of variable morphology;

I have seen, either in person or as published photographs in reference works, what appeared to be both long and short spined forms of *T. bridgesii*, *T. macrogonus*, *T. pachanoi*, and *T. peruvianus*.

John BORG 1976 mentions that a cristate form of *T. macrogonus* is commonly cultivated. I have not yet knowingly encountered any offered for sale.

Cristate specimens of *T. pachanoi* are becoming increasingly available.

They are said by commercial growers to occur within any large planting of seeds.



Trichocereus peruvianus X Juul's Giant hybrid (SS)

Trichocereus

For example the cristate plant pictured above arose in a planting of TJGX*peruvianus* hybrids.

Crests of *T. peruvianus* & *T. cuzcoensis* also exist (both were offered in commercial cutting listings by Karel Knize) but I have not yet knowingly encountered any of the latter in person. Cristate *T. bridgesii* also are in horticulture.

Much of what is available resemble intermediate *pachanoi-peruvianus* material (ex.: CCC)



cristate *Trichocereus peruvianus* (CCC)

Monstrose forms of *T. bridgesii*, *T. cuzcoensis*, *T. pachanoi* and *T. peruvianus* are occasionally available commercially.

The first of these seems to exist in *at least* two separate offerings, one has a tendency to elongate, grow sparse fairly weak spines near the base but often produces normal *longispinus*-like new offshoots, while the other forms shorter rounded joints with sometimes fiercely spined lower portions and reproduces true via cuttings.

What was believed to be a *T. peruvianus* monstrose (obtained from Altman) was very slow growing in our experience. We lost this clone some years ago but during the time that we had it we saw absolutely no spines nor visible ribs on what resembled a fat frosted grey-green cucumber.

All seem sensitive to overwatering.

MS SMITH proposes that the monstrose *pachanoi* are in fact short spined monstrose *peruvianus* but so far as I can tell this is based entirely on his acceptance of what is being sold as short spined *peruvianus* as actually being true *T. peruvianus* (This point, while it may turn out to be true, currently lacks taxonomic evaluations and stands in need of further work) It is possible that there is another answer.

A monstrose purported to be *T. strigosus* is commercially available [these are misidentified *T. shaferi* monstrosus

originating from a single clone arising in a lot of seedlings produced by Oasis.]

The most important point that should be stressed is that the exact parentage (and specific identity) of some of the cristate & monstrose Trichs is unclear to anyone.



One of many beautiful but poorly labeled cactus cuttings shipped by Knize. This one appears to be a *Trichocereus bridgesii*

Too many questions and too few answers concerning some 'pachanoid' *Trichocerei*:

Nathaniel L. BRITTON & Joseph N. ROSE 1920 published the first taxonomic descriptions for a number of *Trichocerei* species. Their key shows *T. bridgesii*, *T. pachanoi*, *T. macrogonus* and *T. peruvianus* to be roughly similar plants physically. As mentioned, variants exist for all of these, keeping identification interesting.

All are said to be branched with stout joints and ribs between 4 and 9 in number, with slender spines between 1 and 7 cm long. Differences were defined in terms of such simple physical features and color descriptive terms.

Interestingly, if examining a large enough number of specimens, or often even branches on a large adult, one can find points in spination, rib numbers or the published floristic descriptions, which can be applied so that the odd example from any of these 4 will fit into each other's description.

It is apparent from observations over the years that hybridization has most probably occurred at multiple points in cultivation and in the wild, that there is substantially more variety than indicated and that these species are all highly variable & probably intergrade; intermediate forms do exist for many and an almost grex-like wealth of intermediates exist for *pachanoi* and *peruvianus*. We are perhaps seeing speciation in process but it is arbitrary to say *pachanoi* and *peruvianus* are one species based on their flowers but not include *bridgesii*, *pallarensis*, *tarmaensis*, *puquiensis* and several others. If the floristic differences ARE adequate for dividing *bridgesii* from the rest then *peruvianus* itself would LARGELY need to be split from *pachanoi* and what is presently known as *peruvianus* would have to be split up further into at least several species.

Whether a meaningful taxonomic key can ever be generated for the *pachanoid-peruvianoid-bridgesioids* remains to be seen. Without some type of adequate means for recognizing what are hybrids, success seems doubtful.