

Principes, 33(2), 1989, pp. 91-93

How Many More Palms?

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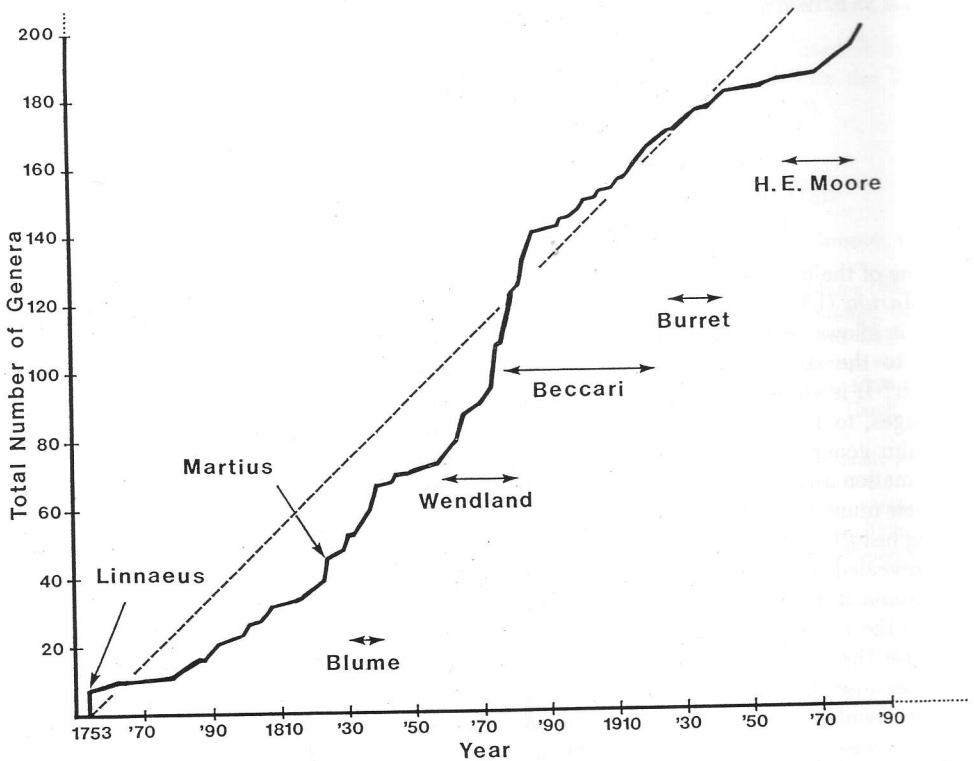
One of the many benefits of the *Genera Palmarum* (Uhl and Dransfield 1987) is that it allows one to estimate the likely limit to the size of the palm family. Or does it? It is an interesting exercise, using its pages, to assess the rate of description of palm genera and, perhaps, to use this information and extrapolate an upper limit to their number. In doing this, some interesting historical, or even sociological trends are revealed that reflect the way in which taxonomic discoveries are made. I use genera as the taxonomic unit, not necessarily because they provide a precise estimate, but because information about them is readily available in *Genera Palmarum*. A more precise evaluation would come from an enumeration of species, but to assemble the information would be a work of great labor. However, my guess is that it would not modify the present conclusions because the same principles apply to any taxonomic unit.

Figure 1 plots the date of formal establishment of the genera of palms, as recognized in *Genera Palmarum*, as cumulative totals. It begins with the eight generic names still in current use and used by Linnaeus (1753) in his *Species Plantarum*, which is the starting point for the application of the present rules of botanical nomenclature. He used the names *Areca*, *Borassus*, *Calamus*, *Caryota*, *Chamaerops*, *Cocos*, *Corypha* and *Phoenix*, although usually in a form modified from Linnaeus' initial circumscription, and one more, *Elate*, which is now regarded as a synonym of *Phoenix* (Moore and Dransfield 1979).

Genera Palmarum recognizes 200 gen-

era, a nice round figure, but somewhat conservative since H. E. Moore had recognized 212 genera. Clearly a number of genera recognized by Moore (1973) have been reduced to synonymy in the later analysis. This illustrates that numbers of recognized genera fluctuate according to taxonomic opinion; in fact, in their "finding list," Uhl and Dransfield catalogue an additional (236) generic synonyms i.e., names that have at one time been formally proposed but, for various reasons are not accepted by these authors, i.e., there are more names discarded than used. Clearly some of these exist for trivial reasons, but many are capable of being resurrected according to later taxonomic opinion. An old name cannot, however, be applied to anything newly discovered. The number of accepted genera, as an indication of family size is therefore not an absolute value. It still remains as a very useful measure. It would, of course, be very interesting to plot the appearance of all generic names. This would exaggerate considerably the curve shown in Figure 1.

The overall shape of the curve is roughly sigmoid, with the exception that no asymptote has been approached, i.e., the curve has not yet reached a constant value, which would be expected if all palms, or at least all genera of palms, were known, other things being equal. The sigmoid shape is what one might expect from a knowledge of the history of plant systematics, since it reflects the early slow development of knowledge, its acceleration in the middle and late nineteenth century as exploration was intensified and the subsequent decline as palms became more completely known,



1. (From Tomlinson 1989.) Plot of date of publication of palm genera included in *Genera Palmarum* against the accumulated total number. This does not imply the total number of generic names at each date since many names in older use have become synonymous. Dotted line represents an arbitrary increase of a generic name every year.

i.e., it became more difficult to find new genera. Or does it?

If the curve indeed were precisely sigmoid, then one would be able to estimate the total number of genera of palms quite precisely because the point of inflection in the middle part of the curve would be the midpoint of discovery. The hundredth genus (*Hedyscepe*) was published in 1875 about the midpoint of the period covered by Figure 1 and also a midpoint in the steep rise in the rate of description covering the second part of the nineteenth century. According to this the limit could be 200, but we must consider the top of the curve before deciding this.

Added to the graph is a dotted line which shows a convenient 45° slope, representing

a purely imaginary rate of naming of new genera at one per year. Surprisingly many parts of the curve have a slope close to this line. Significantly the head of the curve (i.e., its most recent part) still maintains this slope; i.e., there seems no sign of the asymptote being approached. In other words the rate of description of palm genera does not seem to be slowing down. In fact no less than 17 generic names for palms have been proposed since 1970.

Now, one might object that this assessment of our state of knowledge of the palms is spurious since it relates to the designation by name of a taxon, which is not the same as its discovery as new to science. New generic names can be created by segregating a species or groups of species from

existing genera, the change is then only hierarchical and does not represent "discovery."

However, if one examines most of the recently created genera of palms, the majority relate to genuine new discoveries of taxa, even though in many instances their existence had been suspected from the records of casual collectors. This rate of discovery seems totally independent of taxonomic practice that is determined solely by opinion.

In Figure 1 I have added the names of the more prominent botanists who have recognized or named palm genera, indicating the period over which their currently accepted genera were published. This is, of course, not all authors of palm genera (some 60 botanists have named palm genera) but some particularly significant ones. This addition shows what seems a particular correlation between the activities of certain botanists and the creation of generic names, since most of the names coincide with rises in the slope of the curve. This is not surprising since it is the responsibility of the taxonomist to do systematics, and one manifestation of professional activity is the creation of new genera. However, there is clear indication, from a knowledge of the history of these botanists that most of them were indefatigable field workers, they not only described new genera, they also discovered them for themselves. The correlation is not absolute, Herman Wendland's name is associated with more palm genera than any other botanist, frequently in association with that of Oscar Drude. These two described many of these genera from

collections made by others. The fact that so many of Wendland's names are still accepted suggested that he was particularly good at the naming aspect of his craft. Also his activity coincided with the flood of specimens being directed towards European botanic gardens.

Nevertheless, the chart suggests that two conclusions can be drawn; first, that we are still some way from the likely upper limit of knowledge of all existing palms; and second, that their discovery is dependent on the activity of energetic field workers who are capable of making informed comparisons. Field work on palms needs to be very actively supported if our knowledge of palms is to continue to grow; the description of a new genus increases our knowledge of the diversity of the palm family quite considerably. Who knows what unexpected benefits may derive from these discoveries; the palm family is too important commercially to neglect the opportunity for the ultimate utilization. This can only come from initial exploration and taxonomic description.

LITERATURE CITED

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Notice

An interim Board Meeting of the International Palm Society will be held in Corpus Christi, Texas on June 3-4, 1989. Those desiring more information should contact: Lynn McKamey, Rhapis Gardens, P.O. Box 287, Gregory, TX 78359. (512) 643-2882