

Review

Reviewed Work(s): *The Genus Nicotiana. Origins, Relationships and Evolution of Its Species in the Light of Their Distribution, Morphology and Cytogenetics* by Thomas Harper Goodspeed

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## REVIEW

THE GENUS *Nicotiana*. ORIGINS, RELATIONSHIPS AND EVOLUTION OF ITS SPECIES IN THE LIGHT OF THEIR DISTRIBUTION, MORPHOLOGY AND CYTOGENETICS. Thomas Harper Goodspeed. *Chronica Botanica* Vol. 16 No. 1/6. Pp. i—xxii, 1—536, with 118 text figures (full page). Waltham, Massachusetts. 1956. \$12.50.

For somewhat over forty years, Dr. Thomas Harper Goodspeed has been studying the genus *Nicotiana*. As a long-continued series of papers shows, his interest in this group is not a narrow one. Reports on cytology and genetics have been interspersed with studies of taxonomy and distribution. There is also his very readable *Plant Hunters in the Andes* (Farrar & Rinehart, New York, 1941), which recounts some of the experiences of the several botanical expeditions in western South America under his leadership. This all added up to a wealth of fact, but it needed to be organized and consolidated. We were happy, then, some five or six years ago, to learn that Dr. Goodspeed was preparing such a unified treatment for publication in book form.

Now we have it. *Chronica Botanica*, Volume 16, Number 1/6, was published in 1956 as a single bound volume entitled "The Genus *Nicotiana*." Book-wise it is what we have come to expect from the *Chronica Botanica* Company. It is handsomely designed and impeccably printed on paper of excellent quality, firm and strong in an attractive dark blue buckram binding. It is significant of the trend in American book publishing that the price is a whopping \$12.50.

The book covers the various aspects of Dr. Goodspeed's interest in *Nicotiana*. Somewhat more than half the text (180 pages) is devoted to the cytology and genetics of the various taxa. About one third (169 pages) is given over to taxonomy. The balance of the book is divided between morphology (74 pages) and distribution. There is an adequate index. It is unfortunate, I think, that the book is written in the pseudo-objective, ostentatiously impersonal style that is affected by so many American biologists. Aside from being boring to read, this style tends to lend a false impression of authenticity to statements of personal hypothesis.

It is unfortunate that, in general, the author's conclusions from the vast quantity of facts which he presents conform to what he would doubtless call "currently accepted" concepts. Indeed, in many cases the author seems not to admit the existence of alternative hypotheses. Perhaps this narrow view is maintained in order to confine the bulk of the book within reasonable limits. But in a study such as this, in which so many new facts about species and their origins are elucidated, it is particularly unfortunate that such a parochial outlook has been maintained.

We shall all regret, I think, that despite the vast amount of study given to *Nicotiana*, the author has done little toward clarifying the relationships of this genus with other genera in the Solanaceae. Without explicit information, it is difficult to accept without scepticism the repeated assertion that *Petunia* and *Cestrum* are the two most closely allied genera. Likewise, without careful investigation, it is difficult to accept the number 6 as the basic chromosome number in the "pre-generic reservoir" (whatever that may be) of the genus.

To the taxonomist, however, the most important part of the study is embodied in the 169 pages which terminate the exposition: the taxonomic revision. In this Dr. Goodspeed acknowledges the collaboration of Helen-Mar Wheeler and Paul C. Hutchison.

The taxonomic treatment begins with an "Historical Resume." This is primarily devoted to a critical evaluation of post-Linnaean taxonomic studies. Despite the considerable social and medical importance of tobacco before the time of Linnaeus, only a single paragraph is devoted to that period. It should be pointed out that Dr. Goodspeed's description of *Nicotiana Tabacum* does not include two forms well known to pre-Linnaean botanists, the "Sana Sancta Inodora" and "Tabacum minimum," both with unwinged petioles. I cannot help but feel that a fuller discussion of the older cultivars of this interesting species would have been valuable.

The taxonomic treatment proper begins with a generic diagnosis and a key to the subgenera and sections. It is a little surprising that we are nowhere told which of the 60 species recognized in this treatment is considered to be the type of the genus. Also, to conform to the requirements of the International Code of Botanical Nomenclature, one of the subgenera and one of the sections should bear the same name as the genus. This is, of course, an entirely arbitrary rule, and quite contrary to the spirit of priority which governs other names of this kind. It is, however, the rule, and careful botanists should abide by it.

Despite the sumptuous typography and imposing synoptic form of the key to the subgenera and sections, it shows unmistakable evidence of uncritical haste in its composition. The first break, for instance, despite its contrast of four characters, does not give a single firm morphological difference that is usable in the herbarium. Habit, flower color, and floral movements are all characters that are seldom mentioned on herbarium labels, and are not generally observable in the specimens themselves. The character of the inflorescence seems, at first glance, to be a useful one, but when we compare the discussion of inflorescence types (pp. 66-74), the key, and the descriptions, this character loses its appeal.

A key, to be of any value, must be usable. By usable I mean that it should facilitate confident identification of adequate material. (In the case of large, coarse plants, such as most species of *Nicotiana*, this should mean a flowering branch with, perhaps a cauline or basal leaf.) A key ought to be utilitarian: a short-cut to the identification of a specimen. It should lead the user quickly and unequivocally to the description of the material in question. This key to subgenera and sections is theoretically beautifully constructed. It utilizes all sorts of important biological features. Unfortunately it takes a great deal of work before one can use it with any confidence. Presumably there are good morphological distinctions between the subgenera and sections of *Nicotiana*. This key does not facilitate their recognition.

It is only fair to point out that, in marked contrast with the general key, the sectional keys are extremely useful. If one can once get to them, the identification of one's material is generally easy. Also, the value of the treatment is much enhanced by the excellent line drawings of nearly every species. The printed descriptions, too, are clear and, in general, unambiguous.

Any reasonable taxonomic treatment of a genus should attempt to account for all names published in that genus. Index Kewensis lists about 250 specific epithets for *Nicotiana*. The present treatment accounts for only about 200. As nearly as one can tell from the indications in the text, the authors have seen the nomenclatural types of less than half of these. In a day when it is the almost universal practice, amongst herbaria, to lend specimens freely, there is little excuse for **any** student to fail to see most of the existing types, or at the least, authentic material, of the taxa

with which he is dealing. Further, when an author has expressly designated a type specimen, as Dunal did for example in *Nicotiana Pavonii*, only the loss or destruction of that specimen (which should be explained) would allow a subsequent student to change the typification, as Goodspeed and his collaborators have done. Finally, *nomina nuda* and homonyms should be listed and their characterization and disposal expressly indicated. Omission from consideration of such names only makes trouble for all subsequent students.

Two cases of questionable nomenclatural handling call for particular comment. The specific epithet *quadrivalvis* does not appear in the index. The taxon so named is, however, treated as *Nicotiana Bigelovii* var. *quadrivalvis*, an illegitimate name. It was not, as Goodspeed's evidence shows, based on a monstrosity. *Nicotiana quadrivalvis* Pursh (1814) var. *quadrivalvis* is the legitimate name of this taxon, and for the type of the species as delimited by Goodspeed. *N. Bigelovii* (Torr.) S. Wats. (1871) var. *Bigelovii*, as delimited by Goodspeed, bears an illegitimate name. It must be called *N. quadrivalvis* var. **Bigelovii** (Torr.) DeWolf, new comb., based on *N. plumbaginifolia*? var. *Bigelovii* Torr. in Pacific RR. Surv. Rept. 4: 127, 1857. In the case of *Nicotiana pusilla* L., the typification, validity, and legitimacy of the name ought to have been settled. The substitution of the later name *N. plumbaginifolia* Viviani, the type of which apparently was not consulted, seems to me to be extremely bad practice.

Goodspeed, by his own admission, does not cite all or even most of the herbarium material that was examined. Coupled with the inadequacy of his general key, this makes the curating of a collection, or the comparison of material, most difficult. It is a discourtesy to the herbaria whose material he used, as well as to those whose material he did not consult.

However many and however great the defects of this treatment, it does supply us with a great deal of very valuable information. The validity of the conclusions may be questioned; the facts may not. The nomenclature may sometimes disappoint us, but we now have good descriptions and illustrations of nearly all the taxa which comprise the genus. Future workers will find this treatment, like those of Lehmann, Dunal, and Comes, one of their basic tools.—Gordon P. DeWolf, *The Botany School, Downing Street, Cambridge, England*.