

REVIEWS

THE GENUS *NICOTIANA*. Origins, Relationship and Evolution of its Species in the Light of their Distribution, Morphology and Cytogenetics. By T. H. Goodspeed. Published by the Chronica Botanica Co., Waltham, Mass. (Wm. Dawson and Sons, Ltd., London, W.C. 2) as Volume 16 of *Chronica Botanica*. Buckram, pp. xxii+536 118 plates and illustrations. \$12.50.

This work contains a detailed survey of the geographical distribution, morphology and cytology (including chromosome morphology) of the species of the genus *Nicotiana*. The evolutionary relationships of the various species are discussed in the light of these facts and in the light of cytological studies of interspecific hybrids. The work brings within a single volume an enormous mass of information, enabling the many ramifications of the genus to be seen as a whole.

Under the joint authorship of T. H. Goodspeed, H. M. Wheeler and P. C. Hutchison, a complete taxonomic account is given of all the 60 species recognised, with whole-page line drawings to illustrate their morphology. Although the book will at once become the standard work for the taxonomist, it will at the same time be of value to the cytologist and all interested in evolution, particularly in the mechanisms of species formation. In this respect, two sections of the genus show aneuploid series in their chromosome numbers, one at the diploid and one at the tetraploid level. All the other sections show great uniformity of chromosome number, and in them new species seem to have arisen, some by allopolyploidy and some by gradual evolutionary divergence without change of chromosome number. The parentage of several of the amphidiploid species, deduced from morphological and geographical evidence and from the evidence of chromosome numbers and behaviour, is confirmed by details of chromosome morphology. Thus the amphidiploid *Nicotiana tabacum* has a haploid chromosome complement made up of 10 with median, 5 with sub-median and 9 with sub-terminal centromeres. The corresponding figures for its diploid progenitors, *N. otophora* and *N. sylvestris* are 7, 0, 5 and 3, 5, 4 respectively. An interesting feature of *N. otophora* is the marked difference in size between the chromosomes with median centromeres and those with sub-terminal centromeres, compared with some related forms in which chromosome size is more uniform. The diagram (fig. 57, p. 310) which sums up the postulated evolutionary relationships of the various species is misleading with regard to the parentage of *N. tabacum*. Many taxonomists will welcome the broad concept of a species implied by the statement (p. 145) that "these tetraploid races" are "insufficiently distinct from *N. suaveolens* morphologically to deserve specific rank".

Criticism of such an outstanding publication seems out-of-place, but it is disappointing to find no reference to the classic work of East and his collaborators in determining the genetic basis of incompatibility of pollen and style in *Nicotiana*. Indeed there is hardly any discussion of incompatibility in *Nicotiana*, apart from a general statement (p. 317) that some species are self-sterile and some self-fertile. This omission seems remarkable, in view of the undoubted evolutionary significance of self-sterility, and the fact that the genetic basis of the most common type of incompatibility was first discovered in this genus. Nevertheless the book is a monumental work.

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