A PRELIMINARY STUDY OF THE OAKS AND HICKORIES OF OKLAHOMA

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Constant efforts satisfactorily to identify field collections of oaks and hickories have more often led to complete despair than to a happy solution of what appears to be a genuine biological problem within our state. How frequently one obtains a specimen from a tree and says to oneself: "I cannot identify it here, but as soon as I get it pressed, I can easily determine its name by a comparison with other specimens in the herbarium!" And also, how frequently does one approach the herbarium cases with eagerness, only to find the specimens within a certain folder in complete disarrangement and disarray!

These experiences occurred with such surprising and such exasperating repetititious, especially when members of the genera *Quercus* and *Carya* were concerned, that I very quickly realized the need of an adequate systematic study of each. No two manuals or reference works contain the same number of species for Oklahoma, and such descriptions as are printed are necessarily so brief and concise that it is next to impossible to identify the plants so described. No single adequate monograph for either, at least within the last ten years, has come to my attention (although the excellent work of Sarah Dyal[1] and C. H. Muller[2] is important but neither is hardly a monographic study of *Quercus*), and consequently, it is my belief that such a work should be undertaken, and that when completed it will form a basis for such further study as indisputably must be made. Specific lines and concepts change far too rapidly in taxonomic circles, and yet it is entirely fitting that as Nature changes, so should the taxonomist. And no one will argue that Nature is stable!

With a grant, very kindly awarded me by the Faculty Research Fund at the University of Oklahoma, I set about to study the species of the two genera under discussion and to ascertain certain facts regarding speciation and distribution. The problem involves many aspects and has numerous difficulties. To date numerous field trips have been made to various parts of the State and nearly every oak and hickory in fruiting condition within sight has been collected. Identification of these has been commenced and will be carried through the winter until the 1939 spring collecting season begins. It is then proposed to continue the field trips and to collect specimens in flower wherever available. Then, with adequate collections of both fruiting and flowering specimens, a really thorough systematic study of the genera can be made. It is not anticipated that the work will be completed until the fall of 1940.

The problem of hybridization, especially in *Quercus*, is one which particularly interests me. The question as to its occurrence can only be be answered in the affirmative, but to the question: "What disposition should be made of these hybrids?" I am, at least momentarily, at a loss for an answer. Personally, I am not in favor of the current treatment in most systematic papers—that of giving new specific and, or, varietal names to those entities known to be of hybrid origin. It seems more logical to denote the two parents and to indicate the fact that the plant is a hybrid of these by a cross-mark, "X" as is done in the more conservative manuals. And although it sounds incredible at first, it is not surprising how often one can spot such a specimen in the field. After all, once the typical form of a species is clearly understood (and to understand it is easy, if

one will take the trouble to study authentic herbarium material), it is not difficult to recognize hybrids in the field. *Q. marilandica* (the black-jack oak) has distinctive wedge-shaped leaves whose veins project out of the margins as short spines. *Q. stellata* (the post oak) has a definite 3 to 5 lobed leaf without the excurrent veins of the black-jack. If then, one sees a plant with some leaves which are wedge-shaped and some which are lobed, the only obvious conclusion is that it is a hybrid of *Q. marilandica* and *Q. stellata*. Often the same tree will have leaves which are entirely alike, neither always wedge-shaped nor always lobed, but my experience has been that invariably one can select at least *one* of the parents of such hybrids, if not both of them, provided (and this is most important) that one is able to recognize the *typical* form of the parents. It is rather disheartening to young and inexperienced taxonomists to go through manuals and floras whose pages are filled with endless names of unfamiliar species and to endeavor to identify their specimens from a key based on fruiting characters (when their twig contain only mature leaves!) or on flowering characters (when their twig contain only mature leaves!) or on flowering species of *Quercus* published in our journals (it is rather difficult to pick up one and not to find that situation current) I immediately think: "another hybrid" and forget it. As I see it, this business of hybridization is being carried too far! We all know that it occurs and that as a means of species-making it is most important, but too often we seem to forget that species are *not* made overnight and that they must go through a very slow and gradual process of evolution which may take numerous years before they can be considered as specific entities. Hence, I have little sympathy for those taxonomists (or others) who consider any change in an offspring as worthy of specific rank. Nor can I sincerely classify them as varieties since my conception of a variety implies a distinct geographical distribution over a given area, usually quite beyond the range of the species. Is it not then the course of wisdom to treat these variations in *Quercus* merely as tentative units and to label them in the herbarium as hybrids, at least insofar as we are able? One cannot hope to know comprehensively the entire history of each tree, and until some degree of stability is exhibited in *Quercus* as a genus it would appear only logical to treat all deviations from the normal as transient entities.

Cytological work will be of inestimable value in solving some of the problems of hybridization so clearly exhibited in *Quercus*, and until the taxonomist realizes this paramount fact he will find progress slow and ponderous. I hope to obtain cytological aid in this study, but obviously its scope is too large and the number of specimens are too numerous for a completely survey. Actually what would be of most advantage would be a separate taxonomic study and a separate cytological one, with the results of each correlated and published jointly by the two authors concerned. Such treatments have been done for *Tradescantia*[3] and for *Iris*[4] as well as for various members of the Ericaceae. Cytology is the most useful aid the taxonomist can look for and the cytologist is his warmest friend. Let them work together and there will be definite progress; let them work against each other and there can be only "wailing and gnashing of teeth."

These problems of speciation are concerned briefly with *Quercus*. *Carya* (the hickories) is known to hybridize only rarely, and the problem of speciation in that genus is comparatively simple. But there are several instances in Oklahoma of geographic isolation in the hickories, and these shall receive careful attention.

It is hoped that at the next annual meeting a complete report can be made concerning the present taxonomic status of these two genera. Mean-

while a cordial invitation is issued to all Academy members to send me such specimens from within the state as are available and to cooperate in this study. The more specimens which are obtainable for study the more comprehensive and thorough such an investigation can be, and thoroughness and accuracy should be the basis of all scientific endeavor.

LITERATURE CITED

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