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A NEW CONIFER HERBARIUM

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At the Institute of Forest Genetics, Placerville, California [1]), we have recently organized a specialized herbarium of pines (*Pinus*) and firs (*Abies*). Incorporated in it are the many specimens that have accumulated since the Institute was established in 1925. Like the Eddy Arboretum, the herbarium is an integral part of our research program, which is concerned with the genetic improvement of conifers native to the western United States. Interspecific hybridization and geographic variability are important parts of the program, and the herbarium is particulary useful in documenting this research.

Because we deal exclusively with coniferous materials, our techniques have been adapted to their bulky nature. For mounting specimens, we use herbarium plastic and sheets of high-grade cardboard cut to the standard size of herbarium paper. Most cones, bark, and other unmounted materials are stored in heavy-duty (0.004-inch thick) polyethylene bags. Fir cones are prevented from disintegrating by several interconnected straps of thickened herbarium plastic.

Our general pine collection includes cones, foliage, seeds, and seedlings of most of the 95 to 100 species in this genus — about 3,000 specimens in all. The regions best represented are the western United States, Mexico and Central America, and east and southeast Asia. The extensive collection of Mexican pines includes specimens collected by E. L. Little, Jr., M. Martinez, N. T. Mirov, and the 1962 North Carolina State College expedition to Mexico (publ. 1963). The newer general collection of *Abies* includes about 500 specimens; only the western North American firs are adequately represented in it. Collections by J. L. Hamrick, O. V. Matthews, G. B. Parker, and K. J. Roller are included. Most of the specimens in these general collections were obtained from single trees, but many recent additions are small (5- to 10-tree) mass collections from single stands. The other genera of conifers have only token representation in the herbarium.

One important function of this herbarium is the documentation of our research program. Examples are collections of the many pines whose turpentine has been analyzed by N. T. Mirov (1961), and specimens of the numerous interspecific pine hybrids produced at Placerville during the past 40 years (Little and Righter 1965).

Another major function of the herbarium at Placerville is the preservation of mass collections of conifers. These collections document a number of comprehensive investigations of geographic variability within species or species complexes (table 1). Most of these studies have been the subjects of Ph. D. theses at the University of California. This kind of material, which is much too bulky to be acceptable to most herbaria, occupies more than half of our herbarium. In most instances the samples encompass the range of the species. Growing at Placerville are offspring of *Pinus attenuata, P. contorta, P. flexilis, P. strobiformis, P. radiata,* and *P. sabiniana* parent trees included in these mass collections.

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Table 1. — *Mass collections of pines in the herbarium of the Institute of Forest Genetics, Placerville, California*

Species	Estimated number of trees	Kinds of material	Collected or assembled by	Reference
Pinus attenuata	150	C, F [1]	G. B. Newcomb	Newcomb (1962)
P. contorta	400	C, F, L	W. B. Critchfield	Critchfield (1957)
P. elliottii	250	C, S, SD	A. E. Squillace	Squillace (1966)
P. flexilis [2]	300	C, F	M. M. Douglass and J. R. Douglass	Douglass (1955)
P. flexilis and P. strobiformis [3]	600	C, F	J. W. Andresen	Steinhoff (1964)
P. monticola [4]	100	C	B. V. Barnes	
P. muricata	150	C, F	J. W. Duffield	Duffield (1951)
P. ponderosa	2,000	C, F, B	R. Z. Callaham	Callaham (1962) Wells (1964)
P. radiata	300	C, F, S, L	M. B. Forde	Forde (1964)
P. sabiniana	150	C, F, L	J. R. Griffin	Griffin (1964, 1965)

[1]) C = cones, F = foliage, L = leaf transections, B = bark, S = seeds, SD = seedlings.
[2]) Mostly Colorado.
[3]) *P. strobiformis* from U.S. only.
[4]) Elevational transects from northern Idaho.

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