

GEOGRAPHIC VARIATION IN FOREST TREES

Morgenstern, E. K.: Geographic Variation in Forest Trees. Genetic Basis and Application of Knowledge in Silviculture. UBC Press, Vancouver, 1996, 209 pp., ISBN 0-7748-0579-X, price 75 CND.

"Trees are the largest plants and, when growing together in forests, they constitute the most impressive manifestation of plant life and diversity" – *voilà* the first sentence of this book, dealing with the problems of the genetic background of the geographical variation in forest trees in the broadest sense.

The book is divided into six chapters. The first one provides a short excursion into the history of genetics and breeding of plants, with the emphasis on forest trees. Although a part concerning the development of ideas of the cytological and molecular bases of heredity together with important names of T. H. Morgan, J. D. Watson or H. C. Crick are missing, this chapter gives a detailed overview of the genesis of scientific thoughts as well as practical activities in forest tree breeding.

The second chapter is aimed at the description of the principal concepts of population genetics. Genetic processes determining the genetic structure of populations, like selection, migration, mutations, genetics drift, as well as the factors like population size and subdivision, reproductive and mating systems, are briefly reviewed. A reader without a deeper knowledge of genetics may miss an explanation what a gene actually is and what is the physiology behind the gene action, since this is essential for understanding the nature of the described processes, especially natural selection.

In the chapter entitled Environmental Influences and Geographic Variation, the physical factors causing the differentiation by natural selection, and the effect of Pleistocene glaciation and other geological events on the genetic variation of tree species are discussed. The author describes the differences due to vegetational zonation, phenology, ecology, and genetic systems, resulting in different types of variation patterns. The section dealing with the design and statistical treatment of experiments aimed at the characterization of the

geographic variation of phenotypic traits may appear brief, but this subject is complex and is not of primary interest for this type of publication.

The fourth chapter provides the basic information about the range, ecological and cytological characteristics, as well as the patterns of geographical variation of several species of the temperate and boreal zones of Europe and North America. No examples are given for tropical species, or for tree species of the Southern hemisphere.

In the fifth chapter, the problems of interactions between genetics and silviculture are presented. The concepts of seed origin control, seed zones, transfer of propagation material, and introduction of exotic species are discussed.

The last chapter deals with the conservation of genetic resources in forest trees. The author defines the motivation of gene conservation as a compensation of human interference into the nature. The methods and issues of *in situ* and *ex situ* gene conservation are discussed. The relationships between gene conservation and breeding, the problems of gene conservation programs and the role of the international cooperation within these activities are mentioned quite briefly.

From the formal point of view, a running numbering of chapter subdivisions would be useful, since it is frequently difficult to identify the hierarchy of the chapter arrangement.

In conclusion: this book contains much valuable information, which can be of use for all who work with forest trees: tree breeders, conservation biologists as well as foresters. It can fully be recommended as a good textbook for undergraduate and graduate courses in forest genetics and breeding in Europe and North America.

Dušan Gömöry (*Zvolen, Slovakia*)