
Preface

The beeches (genus *Fagus*, with a dozen of species) are widespread elements in the woody flora of the northern hemisphere. In the mountain vegetation, beech woodlands occupy the upper belt of compact deciduous forests, so that, at more elevated altitudes only the evergreen needle-lived forests of boreal conifers occur. At the boundary between deciduous and evergreen forest, the beech forests can be observed on Mt. Fuji, in the mountains of China, in Caucasus, and in the Alps. The only exception are the north American species of beech (*F. grandifolia*) growing in the plains, under cold climate, together with other deciduous trees, mainly maple. These mountain forests of the northern hemisphere have a counterpart in the *Nothofagus* forests of Patagonia and New Zealand, which look very similar (as to aspect and ecology) although recent results demonstrate that *Fagus* and *Nothofagus* evolved independently from one another.

The beech forest was clearly perceived from botanists and foresters as a distinct vegetation form, because of the compact structure of the canopy. This vegetation was clearly described still in the nineteen century, from the most relevant phytogeographers, in Germany, Switzerland and Austria. The first concept of the beech forest, as an essential biological and ecological unit of plant life in the mountains, is expressed in several publications of B. Pawlowski (prof. in Krakow, Poland), who in 1928 described the alliance *Fagion sylvaticae* and order *Fagetalia* based on the beech forests of the Tatra mountains (Carpathians): the presence of these coenological units was successively confirmed on all mountain systems of Central and Southern Europe, from the Pyrenées to the Alps, Balkans and Apennines, until the Mediterranean islands Corsica and Sicily. Independently from these developments, in the years 1949–1954, Tokio Suzuki described in Japan the beech forests with *Fagus crenata*. The successive travels and field investigations by R. Tüxen in Japan (in the 1960s) allowed the possibility to compare the parallel adaptations (and the differences) between these important forest systems in Europe and Japan.

During the following years, several Japanese scientists visited Europe (in particular A. Miyawaki) and scientists from Europe had the possibility to be introduced to the study of the vegetation of Japan (for the writer of these lines, the first experience was during the memorable International Excursion of 1974). The following discussions and exchange of experiences (in many papers, meetings and in the

field) led to the persuasion that the beech forests on both extremities of Eurasia had similar composition and ecology. From this background, develops the personal experience of prof. T. Hukusima, the first Author of this book, who in the period 1980–1990 elaborated a synthesis of beech forests in Japan and successively carried out many research periods investigating directly in the field the beech forests of Europe, SW-Asia and N-America, and in particular with excursions in different countries of E-Asia (Korea, continental China, Taiwan). These field investigations had a focal point when both Hukusima and myself had the possibility, at the beginning of November 2003, to investigate the habitat of the rare *Fagus mexicana*, growing in a remote chain of the Sierra Madre Oriental.

It has been necessary as shown above to briefly summarize the long historical development, which lead to the origin of this book. It was realized with the collaboration of leading scientists from different East-Asiatic countries, the following elaboration of data and discussion of the results were carried out successively, during repeated stages of prof. T. Hukusima in the Botanical Garden of the Rome University. This study gives, for the first time, the possibility to have a general outlook on the different aspects of the beech forests in East Asia, from Hokkaido to Taiwan and from the coasts of the Pacific Ocean to the easternmost chains of the Himalayan system. This large synthesis gives a general information on over 50 different types of beech forests, distributed in two vegetation classes with 22 types of forest communities. Over 1,500 species of the forest flora of East Asia (trees, shrubs, herbs, mosses) are reported. In this way, it is shown clearly the extraordinary biodiversity concentrated in the deciduous forests of the East-Asiatic mountains. From this synthesis, it is also possibly to propose a hypothesis on the evolution of the beech forests, based on the central role played by the mountain systems of SW China (Yunnan) as an ancient centre of origin for botanical groups: many of them in the following eras spread over most of the boreal hemisphere and presently are an essential component of the flora in the temperate and cold zone of Eurasia.

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Phytosociology of the Beech (*Fagus*) Forests in East
Asia

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