

Natural Forest in Southern Part of the South Japanese Alps

by

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Introduction

The South Japanese Alps are the largest mountain ranges in Japan spreading over three prefectures, Shizuoka, Yamanashi, and Nagano in Central Honshu, and include 12 peaks higher than 3000 m above sea level. The Alps contain three natural forest zones arranged in altitudinal layers. The higher zone is subalpine evergreen coniferous forest zone, the middle cool-temperate broad-leaved deciduous forest zone, and the lower warm-temperate broad-leaved evergreen forest zone. Forests of the former two zones are reserved relatively in good conditions in the southern part of the South Japanese Alps, especially in the basin of the Sumata River in Shizuoka Prefecture. Those of the last zone, however, have been replaced almost entirely by artificial forests of *Cryptomeria japonica* and *Chamaecyparis obtusa* etc.

For the first step of the ecological study on the natural forests of the southern part of the Alps, we select the basin of the Sumata River, because the forests are reserved in most natural conditions in this area. Although vegetation of a small part of the forests of this area was studied by Yuasa (1975), most parts of the forests remain ecologically unknown.

In this paper, we will outline the forest types in the whole area of the basin of the Sumata River based on the results of investigations pursued during two years from 1977 to 1978. The forest types were decided through the physiognomy, and the forests of each type were investigated by usual the quadrat method.

I. Environmental conditions

The area selected for the investigation is about 20,400 ha along the Sumata River. This area ends at Mt. Tekari to the north and is surrounded to the east and west by two mountain ranges running down southwards from Mt. Tekari (Fig. 4). A lot of streams from both the eastern and western mountain ranges carve steep valleys towards the Sumata River. The highest point in this area is 2591 m, the top of Mt. Tekari, and lowest 600 m, riverside of the Sumata River, in altitude. Geologically, this area belongs to the Cretaceous folded zones of the Shimanto orogeny. The zones are crushed and dragged strike-slip movements of *Fossa Magna*, a large meridional leftlateral fault in Central Japan. Deep weathering and crush of long geologic time resulted in many landslides and rock falls in this area (Tokuyama, 1975). The climatic condition of this area is characteri-

zed by the relatively high annual mean temperature (12.5°C*) and by the plentiful annual precipitation (3,105 mm**).

II. Enumeration of the Forest Types

1. *Picea* type forest

We recognized this forest type by the dominance of *Picea jezoensis* var. *hondoensis* in the canopy layer. The canopy layer of this forest was composed of almost pure standings of *P. jezoensis* var. *hondoensis* of 20 to 30 m in height and of 50 to 70 cm in DBH. The secondary tree layer was not recognized although very thin standings of *Tsuga diversifolia*, *Sorbus commixta*, *Abies veitchii*, and *Betula ermani* were observed. The floor in some forests was covered densely with seedlings and young trees of *P. jezoensis* var. *hondoensis* mixed with *T. diversifolia* seedlings, and in other forests it was covered with dense community of *Sasa senanensis* (Fig. 1).



Fig. 1. *Picea* type forest.

2. *Tsuga* type forest

This forest type was decided by the dominance of *Tsuga sieboldii* in the canopy layer. The canopy included mainly trees of *T. sieboldii* of 17 to 25 m in height and 40 to 50 cm in DBH. Trees older than 450 years were often recognized in such forests. In the canopy layer, *Fagus crenata*, *Betula davurica*, *Quercus mongolica* var. *grosseserrata* were also found although their mixing rate was approximately 20% or less. Sometimes taller trees *Picea polita*, up to 30 m in height, protruded over the canopy layer. The middle layer was composed of scanty standings of suppressed trees of *T. sieboldii*. The seedlings and young trees of *T. sieboldii* were seldom found on the forest floor. The paucity of the trees and seedlings in these strata was 9 distinct feature of the *Tsuga* type forest in the investigated area (Fig. 2).

Dense forests of this type were found on ridges and gentle slope of the

*, ** According to the data of Shizuoka Meteorological Observatory.

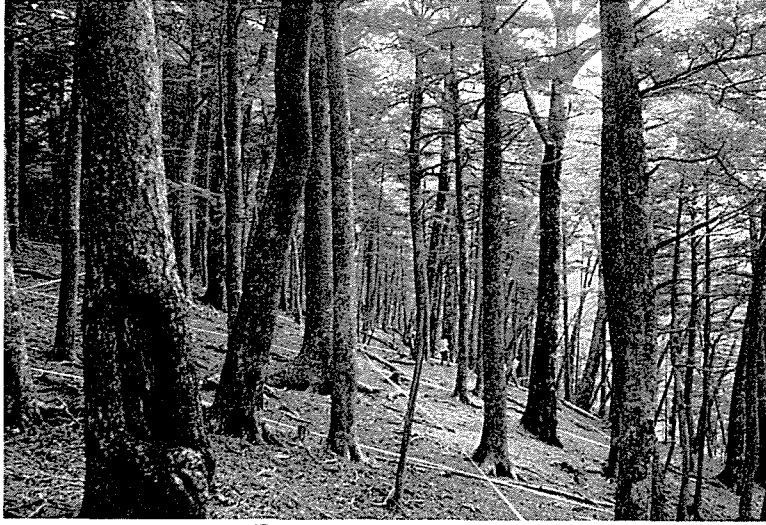


Fig. 2. Tsuga type forest

western mountain range of the studied area and dominated in cool-temperate broad leaved deciduous forest zone of the Alps, 1400 to 1800 m in altitude.

3. Fagus type forest

This forest type was decided by the dominance of *Fagus crenata* in the canopy layer. In the studied area, the forests of this type were characterized by the mixture of a large number of trees of various other species (Fig. 3). They were *Abies homolepis*, *Stewartia pseudo-camellia*, *Tilia japonica*, *Acer japonicum*, *A. rufinerve*, *Acanthopanax sciadophylloides*, *Betula grossa* etc. In this feature, these forests differed markedly from those of the same type of the other parts of Honshu. The canopy of these forests did not exceed about 20 m in height. The middle layer was not distinctly recognized although thin standings of *Stewartia pseudo-camellia* and *Acer rufinerve* were observed. The floor of these forests was covered with dense *Sasa borealis* community which was universally found in



Fig. 3. Fagus type forest

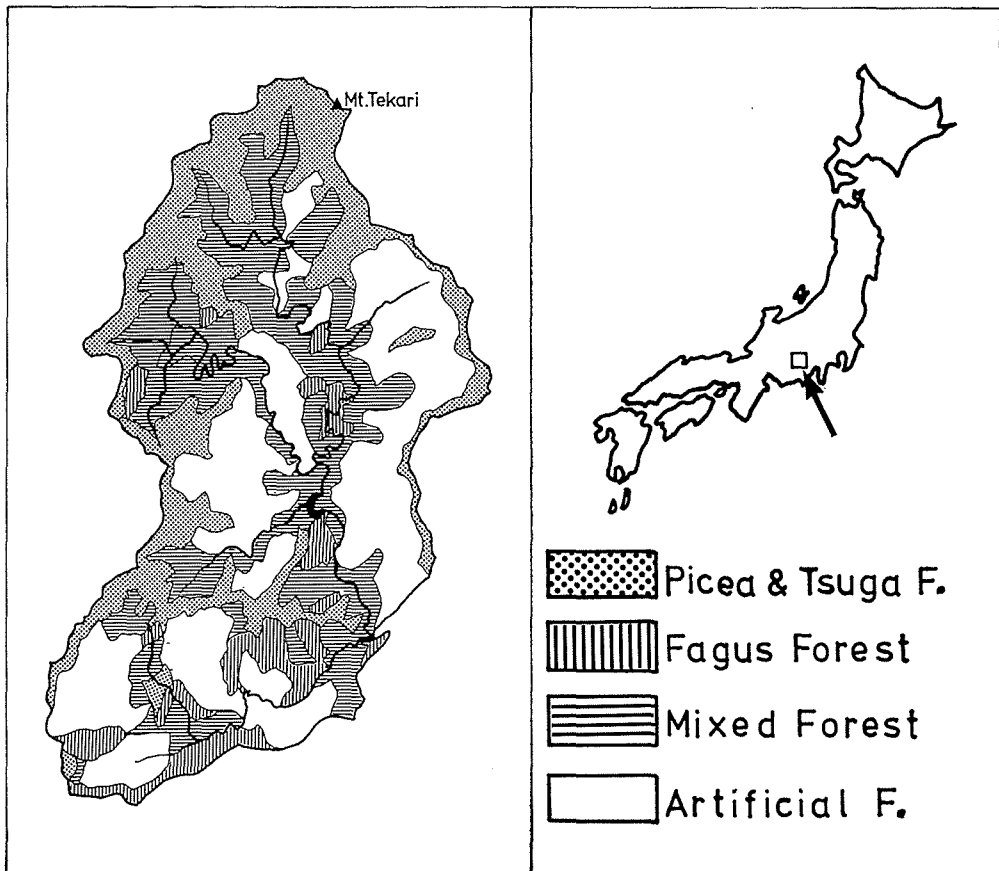


Fig. 4. Vegetation map of the basin of the Sumata River

the Fagus type forests in Japan.

4. Mixed type forest

Steep mountain slopes in the investigated area were covered with miscellaneous evergreen coniferous trees and deciduous broad-leaved trees. As the forests could not be classified into any distinct forest types, we treated them as Mixed type forest in the present paper.

III. Distribution and Area of the Forest of Each Type

The investigated area includes dense natural forests of about 14,600 (Ca. 70% of the investigated area). Most natural forests are distributed in the northern half of the investigated area as shown in the vegetation map (Fig. 4). Wide area of the southern half is replaced by the artificial forests and secondary woods.

Picea and Tsuga type natural forests are distributed in wide area (Ca. 4,200 ha) along the higher ridges, while Fagus type forests are found on lower ridges of south western part and on slopes along streams. Approximately 1,400 ha in total is covered with the forests of this type. The remaining wide area (8,300 ha)

is covered with mixed type forests.

Summary

Natural forest in the basin of the Sumata River of the southern part of the South Japanese Alps is classified into four types based on physiognomy, namely, Picea, Tsuga, Fagus and Mixed type. The distribution of the forests of these types is represented by the vegetation map and the areas of the forests are also estimated.

References

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