

大森岳常緑広葉樹林域における人工林と自然林保護樹帯の群落構造と動態の比較

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1. はじめに

宮崎県綾町は照葉樹林の町として知られ、世界的にも大面積の貴重な照葉樹林が残っている。しかし昭和初めと昭和36年頃に自然林の中に大規模に人工林が造成された。2005年には照葉樹林復元プロジェクトが発足しこの人工林を自然林に復元する計画が立てられた。その中で人工林への自然種の種子供給源として期待されているのが人工林を囲むように網目状に残された自然林、すなわち保護樹帯である。しかし保護樹帯を種子源として使えるのか、また人工林にどの程度復元に役立つ実生が生育しているかなどの研究は皆無である。そこでこれら地域における植生を明らかにし自然林復元における中・長期計画や植樹でない人工林から自然林への生態学的復元方法の具体策を的確に講じるため調査、解析を行った。

2. 調査地と調査方法

大森岳南東稜において標高約750m付近、極相林としてはアカガシやウラジロガシ、ツガが優占するようなエリアにおいて、極相林に近い保護樹帯とスギ、ヒノキの人工林において隣接する3林分をまたぐように25m×70mのトランセクトを設置した。木本層では出現した1.3m以上の全木本個体の種名、個体数、胸高直径DBH(cm)、樹高(m)、葉群下高(m)、生枝下高(m)を測定した。林床植生は全木本実生の種名、個体数、樹高、齢を記録した。解析には、全体を5m×10mのサブコドラートに区分し木本層に関しては胸高直径から算出した種毎の胸高断面積合計(BA)を相対値化した相対優占度(RBA,%)を、実生層の結果表示の一部に種毎の個体数を相対値化したRD(%)を用いた。

3. 結果・考察

木本層に関してはトランセクトを直交する25m×10mの7プロットに区分し、大きくスギ林—保護樹帯—ヒノキ林の傾度に沿って対象地全体の大まかな林分構造を調べた。地形はスギ林からヒノキ林に向かい高低差15mほどで次第に下っており、ヒノキ林では一部40度近い急傾斜が見られた。スギ林側においては人工林と自然林の移行部に先駆性落葉高木種の優占が見られた。これらの落葉樹はDBHがスギとほぼ同じなのでスギ植栽とほぼ同時期に林縁に侵入したと予想された。次に5m×10mのメッシュ35個についてクラスター分析を行い25%、50%、75%レベルの類似度でそれぞれ3、6、11個の部分に区分した。それぞれは相観レベル、地形レベル、パッチレベルに対応する。類似度75%で分類することでパッチ単位での分類を行った結果、ウラジロガシ、ヤブツバキ、アカガシ、タブノキ、ヤブニッケイ、モミの保護樹帯部分6パッチとヒノキとスギの人工林2パッチ、そ

A comparative study on community structure and dynamics between plantation and natural reserved forest in evergreen broad-leaved forest region on Mt. Ohmori, Miyazaki, southern Japan

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1. Introduction

Mt. Ohmori in Aya, Miyazaki prefecture has one of the largest warm-temperate evergreen forests in Japan. Since 1920th, natural forest was cut and changed into conifer plantation, and this planted forests encroached and fragmented, natural forest. Recently, restoration project of natural forest had been launched enhancing the regeneration potential through seedlings understory of plantation, and through lateral expansion of natural forest.

This study aims at collecting basic knowledge about the vegetation of shelterbelt and the seedlings in the plantation, and proposing methods of natural forest restoration using these regeneration potential of the existing vegetation.

2. Study sites and methods

This study was conducted in warm-temperate evergreen broad-leaved forest dominated by *Quercus acuta*, *Quercus salicina*, and *Tsuga sieboldii* on the south-east flank of Mt Ohmori in Aya, Kyusyu. A transect of 25m × 70m crossing a series of forests sugi(*Cryptomeria japonica*) plantation-shelterbelt-hinoki(*Chamaecyparis obtusa*) plantation located at 750m a.s.l. All tree individuals (>1.3m) were recorded in species, diameter at breast height (d.b.h.), tree height (H), and height to the lowest foliage leaves(HL), and lowest living branch(HB). Tree seedlings and saplings (< 1.3m) were recorded in species, H(cm), and age (by counting bud-scale scar of shoot). As for the species abundance, relative basal area (RBA;%) was used for canopy layer analysis, and relative density (RD;%) was used for understory seedling and sapling analysis.

3. Results and Discussion

The transect was divided into seven plots of 10m × 25m, and the stand structure was analysed along sugi -shelterbelt-hinoki gradient. Ecotone between sugi plantation and

shelterbelt was dominated by pioneer deciduous trees. Judged from the fact that d.b.h. of these deciduous trees were nearly the same as that of sugi, these trees might have invaded when the natural forest was cut for sugi plantation. All the 35 meshes of 5m × 10m were subjected to cluster analysis, and the dendrogram was cut at three levels of similarity indices of 25%, 50%, and 75%, and the groups obtained were corresponded to three physiognomic types, six topo-communities, and nine dynamic patches respectively. At 75% similarity level, the community was divided into seven patches of shelterbelt area; i.e. sugi-*Machilus thunbergii*(S-Mt), *Quercus salicina*(Qsa), *Camellia japonica*(Cmj), *Quercus acuta*(Qa), *Machilus thunbergii*(Mt), *Cinamomum japonicum*(Cnj), and *Abies firma*(Af), and two planted forests; sugi and hinoki, and in total nine patches(Fig.1). According to structural attributes (e.g. Max DBH, H) and species composition of each patch, the differentiation of each patch are related to past disturbance and development. The species of *Qa* patch was similar to the primary forest. The differences of composition among *Qsa*, *Cmj*, *Mt*, and *Cnj* patches were probably the differences in time after the past disturbance. *Af* patch was considered as oldest patch because of the biggest H and d.b.h. size. The seedlings and saplings were mainly consisted of evergreen broad-leaved shrubs' seedlings. In addition to this, there were three features in understory layer that ① *Cnj* and *Daphyniphyllum macropodum* (*Dm*) were widely distributed throughout the transect, ② higher emergence of *Quercus acuta* and *Quercus salicina* in planted forest compared with shelterbelt, and ③ many and frequently emergence of seedlings of deciduous pioneer trees at sugi end its marginal ecotone sites.

After thinning of planted forest, bird and gravity disperse type species (*Cnj*, *Dm*) are expected to play an important role through dispersal of seeds into planted forest.

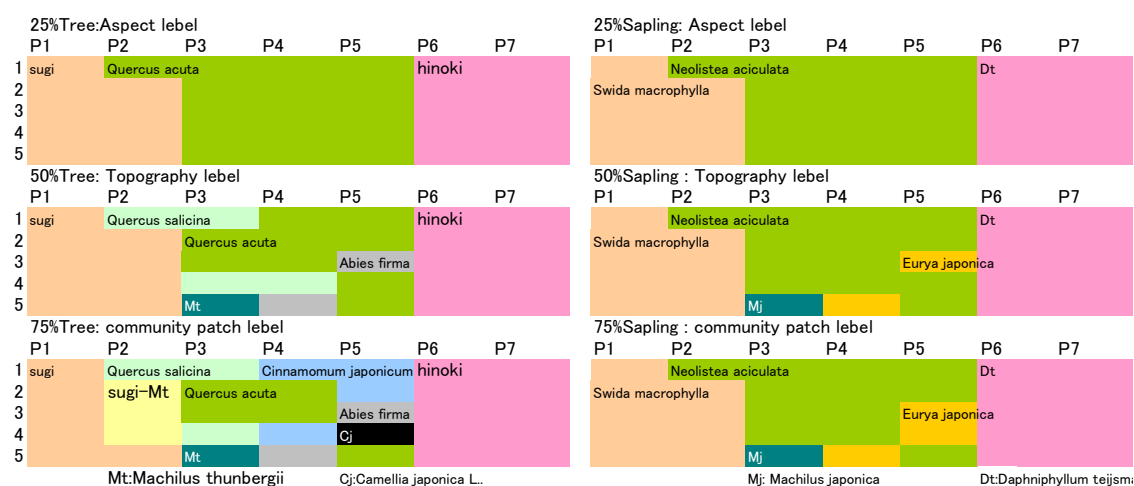


Fig.1 Partial structure of patches in transect divided 25-75% Similarity index.

Left: tree, Right: sapling