

Spatial and temporal variations of subalpine coniferous (*Abies mariesii*) forest distribution during the past 2,500 years in Mt. Hachimantai and Akita-Komagatake, NE Japan

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This study aimed at clarifying the trends of *Abies mariesii* distribution and the environmental factors that determine moisture conditions in wet meadows, such as landform, and surface geology. Further, it aimed to discuss the factors underlying the difference in distribution of *A. mariesii* forests between the subalpine (Mt. Hachimantai) and the pseudo-alpine zone (Mt. Akita-Komagatake).

In Mt. Hachimantai, the landform consisted of volcanic original surface (angle: 1-10°), dissected slope (angle: >10°). This area had a high percentage and density of wet meadow distribution. Thick *A. mariesii* forest tended to be distributed around wet meadows on volcanic original surface. Surface geology survey revealed that loam layers composed of clay were present in all the sites. *A. mariesii* forest area in the southern part was narrower than that in the northern part. According to pollen analysis, *Abies* pollen started to occur approximately 2,500 years ago in the northern part and landslide area, and approximately 1,000 years ago in the southern part (Morita, 1985).

In Mt. Akita-Komagatake, the landform was similar to that of Mt. Hachimantai. Wet meadow distribution in the northern part was similar to that in Mt. Hachimantai in terms of density of wet meadow distribution. In the southern part, the percentage of wet meadows was extremely low. The thickest *A. mariesii* forest in either part of Mt. Akita-Komagatake was narrower than that in Mt. Hachimantai. Scoria and pumice composed of granule gravel characterized the surface geology of the southern part. According to pollen analysis, *Abies* pollen started to occur approximately 1,000 years ago in the northern part, and approximately 2,500 years ago in southern part (Morita, 1985; Ikeda, 2002).

Evidently, it can be concluded that the present distribution of *A. mariesii* forest has been determined by the starting time and the speed of expansion of *A. mariesii* forests, which are affected by environmental conditions such as wet meadows.

Keywords: *Abies mariesii* forest, Subalpine zone, Spatial and temporal variations, Mt. Hachimantai, Mt. Akita-Komagatake