

The History of Semi-natural Grasslands in the Japanese Archipelago: Changes of Human Activities and Persistence of Grassland Habitats

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Abstract

Ecological succession under the absence of human disturbances brings most vegetation into forest in warm and humid climate of the Japanese Archipelago. This circumstance seems to have been ordinary throughout the Holocene. However, grassland species of plants and insects since the glacial period have survived till today in semi-natural grasslands within the Satoyama landscapes. In order to clarify what kinds of human activities have maintained habitats of these plants and insects, I reviewed the history of vegetation, archaeology and Japanese history, and investigated the relationship between the human activities and distribution of the grassland species. In cool and dry climate of the last glacial period, human subsistence was dependent on hunting. After that, forests had expanded in warm and humid climate of the Jomon period (ca. 12,000-2400 year BP), and it caused a shift of human subsistence to plant resources use in forests. On the other hand, semi-natural grasslands have sustained until now for over 10,000 years on outer rim of the Aso volcanic crater in Kyushu as well as other parts of Japan. Analyses of the microscopic charcoal in black soils suggested that frequent wild fires have caused the persistence of the semi-natural grasslands. Human activities are suspected to be the sources of these fires. People used these grasslands as pasture fields for horses since the Kodai (ancient) period. Intensified usage of grasses from meadows expanded after the early modern period. The black soils are often distributed where grasslands had been maintained for long times by fire. The distribution records of endangered grassland species of butterflies and bumblebees statistically well coincide with the distribution of the black soils in the central highland of Japan. This coincidence implies that historical usage of semi-grasslands, regardless of human subsistence changes, have provided continual habitats for the grassland species since the glacial period.

Keywords: black soil; fire; grassland species; microscopic charcoal; semi-natural grassland