

# 2008年度 第20回 地質学セミナー

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## Early Miocene floras and climate in the eastern NE Honshu, Japan

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Seven Early Miocene plant megafossil assemblages from 3 separate sequences in the Pacific side of NE Honshu were studied systematically, and their paleoecological and paleoclimatic conditions were analyzed by detailed examination of fossil occurrence, composition, and physiognomic characteristics. Most of these assemblages had accumulated in lacustrine, fluvial, or shallow-marine environments and are interpreted to have derived from vegetations around the near-sea coastal lowland.

These assemblages, composed of 268 taxa from 46 families and 92 genera of temperate to warm-temperate climate aspects, are distributed in 5 different time intervals during the earliest Miocene to the transition between the Early and Middle Miocene and show a gradual but distinct change in floral composition. The physiognomic characteristics of fossil assemblages indicate that the forest type of lowland vegetation during the first stage (Stage I: ca. 23.4 Ma) corresponds well with the Mixed Northern Hardwood forest, which is characterized by deciduous woody dicotyledons and conifers. This forest type subsequently changed into the Mixed Broad-leaved Deciduous forest (Stage II: ca. 21 Ma) and eventually to the Mixed Mesophytic or Mixed Broad-leaved Evergreen and Deciduous forests (Stage III: ca. 20 Ma) and Notophyllous Broad-leaved Evergreen and Deciduous forest (Stages IV and V: ca. 17 and 16 Ma, respectively).

The change had been accompanied by an increase in evergreens and warm-temperate elements and a decrease in some temperate elements. It indicates an abrupt increase in the mean annual temperature during the intervals between Stages I and III and a gradual increase in the mean annual temperature (MAT) and a marked decrease in the mean annual range of temperature (MART) between Stages III and V. An increase in the summer temperature during the first half of the period affected the distribution of temperate genera, whereas an increase in the cold month mean temperature during the latter half greatly facilitated the colonization of evergreens and warm-temperate elements.

Mean annual temperature estimates are concordant with the analytical results obtained by the physiognomy of each forest type. The analysis clearly shows an increase in the mean annual temperature from Stages II to III and Stages IV to V, both of which correspond well with the occurrence of shallow-marine organisms that inhabit subtropical to tropical environments. The change in the Early Miocene terrestrial climate in eastern NE Honshu is fundamentally consistent with that inferred from shallow-marine molluscan fossils from Japan and suggests a possible causal linkage between the terrestrial and marine climate. A regional tectonic event that affected the oceanic circulation system around the Japanese Islands and/or the Northwestern Pacific was suggested as a possible causal event.

Key words: Early Miocene; floral change; physiognomy; climate; MAT; MART.

### 次回のお知らせ

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