

THE DISTRIBUTION OF THE LATE MIOCENE AND PLIOCENE PLANT-BEARING DEPOSITS IN CENTRAL HONSHU

The Honshu Arc convexly bends in Central Honshu: Northeast Honshu stretches northward with a nearly north-south direction, and Southwest Honshu extends westward with a nearly east-west direction. This bend is marked by the Itoigawa-Shizuoka Tectonic Line. Central Honshu here mentioned comprises geographically the Kwantō and Chūbu districts.

Central Honshu is composed of several different geotectonic divisions. Though Neogene deposits are widely distributed there, they are different in lithology and geologic sequences, representing the vicissitude history of the respective sedimentary basins. The Neogene strata along the Pacific coast of Central Honshu is composed of neritic to bathyal sediments, as in Boso-Miura, Izu, Fujigawa-Shizuoka and Kakegawa regions. On the contrary, the Neogene in inland regions is composed mostly of neritic to lacustrine sediments.

The plant-bearing deposits of Late Miocene and Pliocene time are distributed typically in three regions: the northwestern hilly area of the Kwantō Plain, the low-relief mountain area of central Shinshū (northern Nagano Prefecture), and the eastern margin area of the Nobi Plain and the Chita Peninsula. In these three regions the marine sea invasion commencing at the Early Miocene gradually regressed since late-Middle Miocene time, and the terrestrial sediments including lignite seams were deposited during Late Miocene and Pliocene time. However, the plant-bearing deposits of these regions are somewhat different in lithology and stratigraphic sequence, because each Neogene sedimentary basin belongs to different geologic divisions respectively.

The northwestern hilly area of the Kwantō Plain occupying the Kwantō Province in the geotectonic division, represents a marginal area of the broad shallow sea, which widely covered the Kwantō district during the Neogene. The Late Miocene and Pliocene deposits of this region are composed of sandstone and conglomerate, associated with siltstone, tuff and lignite. A marked feature of the plant-bearing sediments is to contain many conglomerate beds which gravels were derived from the older rocks of the basement, and are poorly sorted.

Central Shinshū region occupies the southern end of the Ōu-Shinetsu Green Tuff Province; it is called the North Fossa Magna region, where the Neogene is a thick complex of the greenish altered volcanic rocks (the so-called green tuff) of Early Miocene time, succeeded typically by clastic sequence of marine origin. The Late Miocene and Pliocene plant-bearing deposits of central Shinshū represent the shallow marine to terrestrial phase of Late Neogene sea, which were widespread northward. The plant-bearing deposits are composed principally of sandstone, accompanied by conglomerate, siltstone, tuff and lignite.

The eastern margin area of the Nobi Plain and the Chita Peninsula occupies the eastern part of the Setouchi Province; the Neogene basin is called the Paleosetouchi basin, which is bounded by the Median Tectonic Line at the south. In this basin the Early Miocene to Pliocene sediments mainly of shallow marine to freshwater origin are generally thin. The Late Miocene and Pliocene around the Nobi Plain are wholly of lacustrine origin. The Late Miocene plant-bearing deposits are composed mainly of clay and quartz sand, associated with lignite seams. These sand and clay were derived from the weathering products of basement granitic rocks. The Pliocene plant-bearing deposits are composed of gravel, sand and clay, associated with lignite and tuff.

Beside three regions described above, the small lacustrine deposits of Late Miocene or

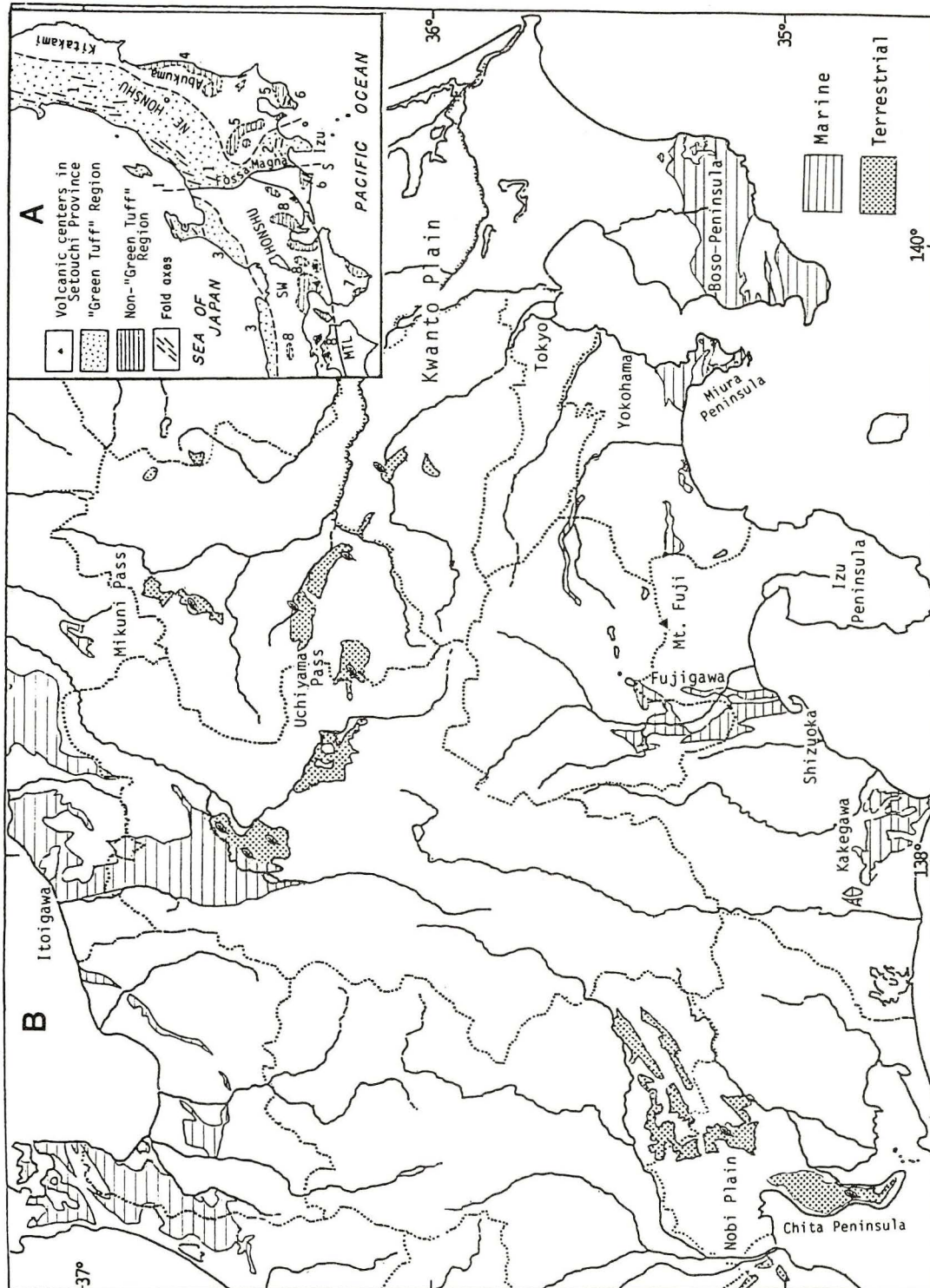


Fig. 1. Neogene geologic provinces of Japan and distribution of Late Miocene and Pliocene deposits in Central Honshu.

A "Green Tuff" Region 1: Ou-Shin'etsu Province 2: South Fossa Magna Province

1: Ou-Shin-etsu Province 2:
3: Hokuriku-San'in Province

Non"Green Tuff" Region 4: Joban Province 5: Kwantu Province

6: Oigawa-Boso Province 7: Nankai-Outer Ryukyu Province

8: Setouchi Province

Line I-S: Itoigawa-Shizuoka Tectonic Line Line MTL: Median Tectonic Line (After Geol. Surv. Jap., 1977)

B Adapted from Geological Map of Japan, 1: 1,000,000. Geol. Surv. Japan, 1978, 1982.

Pliocene time are distributed in the montane areas of northwestern corner of the Kwanto district; they are found at south of the Uchiyama Pass and at the south of the Mikuni Pass. These two areas are included in the Ou-Shinetsu Green Tuff Province, but the features of the plant-bearing deposits are different from those of Central Shinshu. The Pliocene plant-bearing sediments south of the Uchiyama Pass were deposited in the upland lake, which was formed by the depression since the Late Miocene, accompanied with the intensive volcanic activity. These sediments consists of tuff or tuffaceous siltstone intercalated in lavas. On the one hand, the Late Miocene plant-bearing sediments south of the Mikuni Pass are composed of clastic sequence of conglomerate, sandstone and siltstone.

Although the plant-bearing formations of Late Miocene and Pliocene time in Central Honshu are different in lithology features of the sedimentary basin, and geotectonic province, the plant fossil assemblages comprised show generally a similar feature in their composition and components. Such floristic similarity of these fossil assemblages is one of the reason that the Late Neogene terrestrial formations of Central Honshu have been disputed by many authors regarding their geologic age and stratigraphic correlation.