55. *Late Jurassic Plants in the Outer Zone of Northeast Japan*"³

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Upper Jurassic plant-bearing strata have been known in the Outer Zone of Northeast Japan; they are the Tochikubo Formation of the Somanakamura Group, Fukushima Prefecture, Oginohama Formation of the Oshika Group and Moné and Kogoshio Formations of the Shishiori Group. These plant-bearing formations are of marine origin or sandwiched in between the strata of marine origin, and their geological ages are settled by ammonites and other marine fossils as shown in Fig. 1B.

A few plants collected from these formations were studied by Yabe (1922), Oishi (1940), Endo (1952), Oyama (1954) and Kimura and Tsujii (1984). Recently we collected a number of specimens (about 5,000 in number) from these formations with the help of many students of our university. Unfortunately they are mostly broken fragments owing possibly to the transportation of fairly long distance from their original habitats and the reproductive organs of ferns and cuticles of gymnosperms are lost or not preserved owing to the subsequent geological disturbances and igneous activities.

We recognized the following plant-taxa or forms from these formations:

**Bryophytes:** Thallites spp. (A, B)

**Horsetails:** Equisetum sp. cf. E. phillipsi (Dunker) Brongniart, E.? sp.


**Cycadaleans:** Pseudoctenis brevipennis Oishi, P. sp. cf. P. lanei Thomas, P. sp. A, Nilssonia sp. cf. N. canadensis Bell, N. sp. cf. N. densinervis (Fontaine)

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Unclassified cycadophyte: *Cycadites* sp.


Unclassified plants: *Taeniopteris* spp. (F, G), *Carpolithus* sp.

The whole plant-assemblage is characterized by:

1. The presence of matoniaceous ferns, but *Weichselia* has not been found in our huge collection which is thought to be restricted in occurrence to the Lower Cretaceous plant-beds in the Outer Zone of Japan (Kimura and Aiba, 1985).
2. The dominance of varied *Zamites, Ptilophyllum* and *Nilssonia* leaves including *N. schaumburgensis*-type ones.
3. The dominance of such conifers with scale-leaves as *Frenelopsis, Brachyphyllum* and *Cupressinocladus*; these genera have not been found from the Late Jurassic-Early Cretaceous floras in the Inner Zone of Japan.
The presence of *Parasequoia* bearing opposite decussate leaves with several parallel veins.

Dicksoniaceous ferns are rare in number of taxa, and only two genera, *Coniopteris* and *Eboracia* each with a single species, are represented; but dicksoniaceous ferns have not been found from the Lower Cretaceous plant beds in the Outer Zone of Southwest Japan; they are varied and quite abundant in the coeval floras in the Inner Zone of Japan.

The complete absence of *Dictyozamites*, *Ctenis*, *czekanowskialeans*, *ginkgoaleans*, *Podozamites* leafy-shoots and conifers with long needle-like leaves is worth mentioning; they are common elements of the Late Jurassic-Early Cretaceous floras (Tetori-type floras) in the Inner Zone of Japan.

The present Late Jurassic plant-assemblage in the Outer Zone of Northeast Japan is obviously one of the Ryoseki-type floras which have typically been known from the Lower Cretaceous plant-beds in the Outer Zone of Southwest Japan (e.g. Kimura, 1984, 1987).

It is worth mentioning that no common species (or form) is recognized between the Ryoseki-type and coeval Tetori-type floras in Japan.

The present assemblage is similar in floristic composition in generic level to that of the Oaxaca flora, Mexico reexamined, revised and dated as Middle Jurassic by Person and Delevoryas (1982).

Among the Ryoseki-type floras (or assemblages) known mostly from the terrestrial deposits in the Circum Pacific region including South China and Southeast Asia, the present assemblage occupies significant position in this region, because it comes from the geologically date-able marine strata or intercalated beds in between those marine strata.

Detailed systematic description of each taxon will be made by Kimura and Ohana at every group (Somanakamura, Oshika and Shishiori) in the separate papers together with the discussion of phytogeography in the Circum Pacific region.

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References


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