SPORE AND POLLEN ASSEMBLAGES OF THE UPPER CRETACEOUS HAKOBUCHI GROUP IN HOKKAIDO, JAPAN

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ABSTRACT

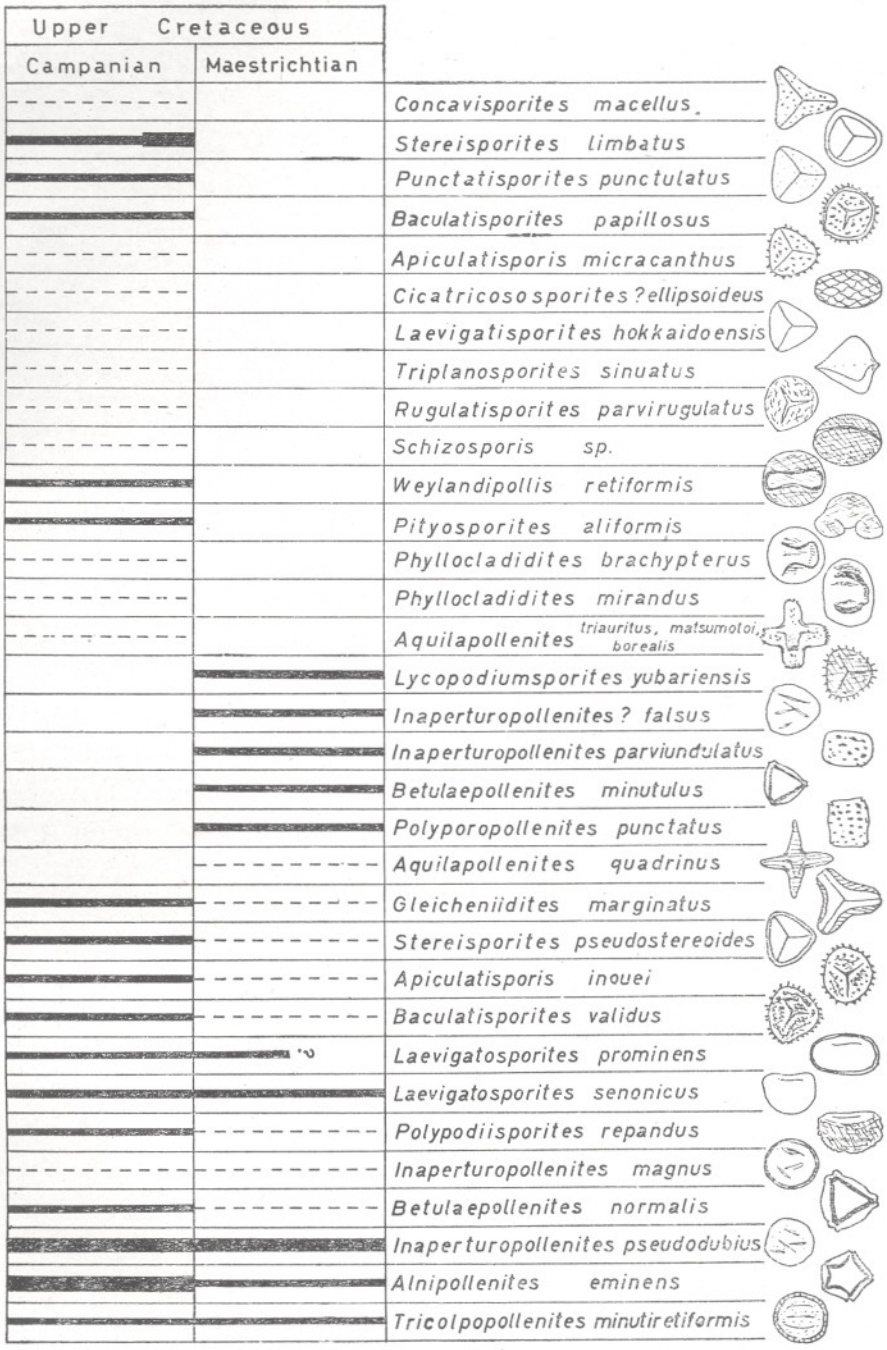
Many spores and pollen of the Upper Cretaceous Hakobuchi group (Campanian and Maestrichtian) in Hokkaido are reported. The range of their appearance and the biostratigraphic classification are illustrated in the text-figure.

The geographic distribution of *Schizosporis*, *Phyllocladidites*, and *Aquilapollenites* is discussed in comparison with the spore and pollen assemblages of the circum-pacific regions. *Aquilapollenites* seems to play a important role in the correlation of the Upper Cretaceous deposits in the circum-pacific areas including Siberia of north of 40°N. Lat. at least.

THERE are now only two reports on the spores and pollen from the Upper Cretaceous Hakobuchi group in Hokkaido. Recently the author (1964) established the biostratigraphic classification for the Hakobuchi group (Campanian and Maestrichtian) on the basis of spores and pollen.

The important spores and pollen from the lower horizon (Campanian) of the Hakobuchi group are following: *Cicatricosisporites* cf. *dorogensis* R. POT. & GELL., *Gleicheniidites marginatus* TAK., *Verrucosisporites perminus* TAK., *Stereisporites limbatus* TAK., *Stereisporites grossus* TAK., *Stereisporites pseudostereoides* TAK., *Laevigatisporites hokkaidoensis* TAK., *Punctatisporites punctulatus* TAK., *Dictyophyllidites divergens* (SATO) TAK., *Rugulatisporites salebrosus* TAK., *Apiculatisporis inouei* TAK., *Apiculatisporis micracanthus* TAK., *Baculatisporites papillosus* TAK., *Baculatisporites vallidus* TAK., *Triplanosporites sinuatus* TAK., *Biretisporites? minus* TAK., *Laevigatosporites prominens* TAK., *Laevigatosporites probatus* TAK., *Laevigatosporites dehiscens* TAK., *Laevigatosporites senonicus* TAK., *Laevigatosporites ovatus* WILSON & WEBSTER, *Polypodiisporites repandus* TAK., *Polypodiisporites invisus* TAK., *Cicatricososporites ? ellipsoideus* TAK., *Schizosporis* sp., *Weylandipollis retiformis* TAK., *Monocolpopollenites shiyuparoensis* TAK., *Inaperturopollenites pseudodubius* TAK., *Inaperturopollenites magnus* (R. POT.) THOM. & PFL., *Pityosporites aliformis* TAK., *Phyllocladidites brochypterus* TAK., *Phyllocladidites mirandus* TAK., *Alnipollenites eminens* (TAK.), *Betulaepollenites normalis* TAK., *Tricolpopollenites minutiretiformis* TAK., *Rhoipites ? minutireticulatus* TAK., *Tetracolporopollenites cretaceus* TAK., *Aquilapollenites triauritus* TAK., *Aquilapollenites borealis* TAK., *Aquilapollenites matsumotoi* TAK., *Aquilapollenites* spp., *Pentapollenites yezoensis* TAK. etc. Of these spores and pollen trilete spores (*Gleicheniidites*, *Stereisporites*, *Punctatisporites*, *Apiculatisporis*, and *Baculatisporites*), monolete spore (*Laevigatosporites* and *Polypodiisporites*), nonaperturate conifer pollen, *Weylandipollis*-pollen, and polyporid pollen are especially abundant. *Cicatricosisporites* cf. *dorogensis* R. POT. & GELL., *Dictyophyllidites divergens* (SATO) TAK., *Cicatricososporites ? ellipsoideus* TAK., *Schizosporis*-spore, *Phyllocladidites*-pollen, *Aquilapollenites*-pollen, and *Pentapollenites yezoensis* TAK. are scarce, but the appearance of *Schizosporis*, *Phyllocladidites*, and *Aquilapollenites* is worthy of note.

The important constituents of spore-pollen assemblage from the fine sandstones of the Upper Hakobuchi group (Maestrichtian) are *Gleicheniidites marginatus* TAK., *Stereisporites pseudostereoides* TAK., *Lycopodiumsporites yubariensis* TAK., *Corrugatisporites* cf. *solidus* (R. POT.) THOM. & PFL., *Apiculatisporis* cf. *inouei* Tak., *Baculatisporites* cf. *validus* TAK., *Biretisporites ? minus* TAK., *Laevigatosporites prominens* TAK., *Laevigatosporites ? probatus* TAK., *Laevigatosporites dehiscens* TAK., *Laevigatosporites senonicus* TAK., *Polypodiisporites repandus* TAK., *Polypodiisporites invisus* TAK., *Inaperturopollenites pseudodubius* TAK., *Inaperturopollenites magnus* (R. POT.) THOM. & PFL., *Inaperturopollenites parviundulatus* TAK., *Betulaepollenites normalis* TAK., *Betulaepollenites minutulus* TAK., *Alnipollenites eminens* (TAK.), *Polyporopollenites punctatus* TAK., *Tricolpopollenites minutiretiformis* TAK., *Tricolporopollenites* cf. *minor* TAK., *Aquilapollenites quadrinus* TAK. etc. Monolete



TEXT-FIG 1 — Stratigraphic succession of the important spores and pollen from the Hakobuchi group.

spores, nonaperturate conifer pollen, and polyporid pollen of Betulaceae are predominant in appearance.

In the Ishikari coalfield the Hakobuchi group lies unconformably under the Paleogene deposits. The difference between the spore pollen assemblages of the Upper Cretaceous and Paleogene deposits is very remarkable. A decline of Pteridophytes in the Paleogene is especially notable. Some species of Angiosperm pollen occur undoubtedly in the Upper Cretaceous and continue to the Paleogene.

Zaklinskaja (1962) divided the Upper Cretaceous and Lower Paleogene pollen floras into three geographic provinces. The author (1964) emphasized also to pay attention to the stratigraphic and geographic appearance of *Schizosporis*, *Phyllocladidites*, *Aquilapollenites* and others. Of these genera *Aquilapollenites* occurs in the Upper Cretaceous and Paleocene deposits in the Pacific area of Northern America, Hokkaido, and Siberia and is a index genus of the *Aquilapollenites* province. The investigation of its stratigraphic and geographic appearance will be promoted by the more detailed data in the future.

The new form genus *Schizosporis* was first reported by Cookson and Dettmann (1959) from the Upper and Lower Cretaceous of Australia. In Canada Pocock (1962) described six species of *Schizosporis* from the Upper Jurassic and the Lower Cretaceous. Then he reported four Australian species. *Schizosporis* seems to be found in the Cretaceous deposits of the circum-pacific areas.

Phyllocladidites was first described by Cookson (1947, 1953) from the Tertiary of Kerguelen Archipelago and Australia. In Japan the author (1964) first described two new species, *Phyllocladidites brachypterus* Tak. and *Phyllocladidites mirandus* Tak., from the Hakobuchi group. The morphologic character of *Phyllocladidites* with very small airsacks is quite like that of *Dacrydium*-pollen. The stratigraphic and geographic problem of *Phyllocladidites* should be examined more closely in the future.

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