Late Carboniferous Palaeoaplysina buildups in the Akiyoshi Limestone, and their paleobiogeographic significance

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Palaeoaplysina, questionably a hydrozoan genus, is an important reef-builder in the Upper Carboniferous to Lower Permian of the Urals, the Canadian Arctic, and western North America. No Palaeoaplysina reefs have been found anywhere in the Tethys region, and Palaeoaplysina is considered to show a Boreal affinity, judging from associated biota. However, Palaeoaplysina buildups have been found from the Akiyoshi Terrane in the western Panthalassa region. In the Akiyoshi Limestone, Palaeoaplysina-bearing buildups are found in the Moscovian and the Gzhelian, respectively.

The Moscovian Chaetetes-Palaeoaplysina-algal buildup consists mainly of Palaeoaplysina-bryozoan bafflestone/bindstone, Chaetetes framestone, Solenopora bindstone/framestone, and Tubiphytes-algal bindstone/cementstone, with bio-lithoclastic grainstone/rudstone. This buildup was probably formed in a reef-front environment. This Palaeoaplysina is the same specimen reported from the Moscovian and Kasimovian reefs in the Canadian Arctic, as protopalaeoaplysinid or ancestral Palaeoaplysina. The Akiyoshi specimen is smaller than P. laminaeformis, and has no pores and protuberance on the upper surface. Therefore, the stratigraphically older Akiyoshi specimen considered to be a new species of Palaeoaplysina.

The Gzhelian (partly Kasimovian) Palaeoaplysina-phylloid algal buildups consists mainly of Palaeoaplysina-algal bafflestone/cementstone, phylloid algal bafflestone/cementstone, Tubiphytes-bryozoan bindstone/cementstone, and bryozoan-algal bafflestone/cementstone, with bio-lithoclastic grainstone/rudstone. These buildups were probably formed in a relatively high-energy, open ocean setting near a reef-front zone.

Palaeoaplysina plays an important role of reef formation in the Akiyoshi Seamounts at that time, because it also occurs from the other limestones in the Akiyoshi Terrane, such as Kasimovian to Artinskian of the Taishaku and the Omi Limestones. Thus, the stratigraphic range of Palaeoaplysina is during Moscovian to Artinskian time in the western Panthalassa region. On the other hand, no Palaeoaplysina was found from the Late Paleozoic cap limestones of seamounts in the Mino and Chichibu Terranes. This fact suggests that Late Carboniferous to Early Permian reef ecosystem was different within the western Panthalassa region.