

Graptolite biostratigraphy of the Ordovician to Silurian boundary succession in the Khao Nui area, southern peninsular Thailand

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The Ordovician to Silurian boundary (OSB) is characterized by the second largest mass extinction in the Phanerozoic. Graptolites are the most useful index fossil of the OSB interval and it is important for studies on OSB to establish the graptolite biostratigraphy. In this study, we investigate graptolite taxonomy and litho-/biostratigraphy of the upper Ordovician to lower Silurian section in the Khao Nui area, southern peninsular Thailand. The Wang Tong Formation, consisting of upper Ordovician to Silurian clastic rocks, are distributed in the study area. The study section is composed of black to grey mudstone and sandstone, 10 m in thickness, and divided into the lower, middle, and upper parts: the lower part (2 m thick) is made up of the black bedded mudstone which conformably overlies the Middle to Upper Ordovician Pa Kae Formation; the middle part is 5.5 m-thick, grey sandstone and black bedded mudstone; black bedded mudstone intercalated with thin white limestone layers constitutes the upper part (2.5 m in thickness). Sixteen rock samples are collected from this section for graptolite examination and 8 species belonging to 10 genera are identified. The result of the biostratigraphic correlation shows that the lower and middle parts of the study section correspond to the Hirnantian stage, the uppermost Ordovician, and the upper part to the Rhuddanian stage, lowermost Silurian. This is consistent with a result led by a macrofossil assemblage occurred from the lower part of the section, including trilobites and brachiopods. On the basis of the microscopic observation of thin sections, the depositional environment of the study section is interpreted as follows: the black mudstones were accumulated on a continental shelf, until the Hirnantian age; at the end of Hirnantian, a sea-level fall caused a deposition of coarse-grained sandstones; in early Silurian, the sea-level rose again and mudstones restarted to deposit.

Keywords: graptolite, Khao Nui, Wang Tong Formation, Ordovician to Silurian boundary