

Age and depositional environment of the Silurian to Devonian “tentaculite” -black shale on the Malay Peninsula

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The Lower and Middle Devonian sedimentary rocks often contain black shale beds with a swarm of so-called “tentaculites”, mainly dacryoconarids. The tentaculite shales have been also known from the Malay Peninsula, since the mid-twentieth century, and described in a few literatures. Biostratigraphy on these shales, however, has not been studied in detail, because of few index fossils. In this study, we describe a tentaculite shale bed in the Mae Ping Formation, distributed in northern Thailand, and discuss the age and depositional environment of these shales on the Malay Peninsula.

Gray bedded limestone is cropped out in the Mae Ping National Park, northern Thailand, and named the Mae Ping Formation by Burrett et al. (1986). Conodonts and nautiloids roughly indicate an Early Silurian to Middle Devonian age for the formation. The limestone overlying a black shale bed with abundant tentaculites is lithologically correlated to the Unit G in the Thong Pha Phum Group, distributed in western Thailand (Ridd, 2011). The study section is located at the Ko Luang Waterfall and totally 14 m in thickness. The lower part of the section consists of 3-m-thick black shale interbedded with limestone, and the overlying gray bedded limestone constitutes the middle part of the study section, which is 6 m in thickness. The upper part is 5 m thick and made up of thinly bedded, dark gray limestone. This section is compared with the lower member of the Mae Ping Formation of Burrett et al. (1986). The tentaculite fossils are included in the black shale and dark gray limestone in the lower and upper parts, respectively, and identified as *Nowakia* sp. and *Styliolina* sp. The section also yields abundant conodonts. The lowermost bed of the lower part contains an assemblage consisting of only coniform conodonts, *Dapsilodus hamari*, *Dapsilodus obliquicostatus*, *Panderodus* sp., *Belodella* sp., and *Pseudooneotodus beckmanni*, which indicate the Wenlock to Ludlow in age. Conodonts from the middle of the lower part include *Wurmiella excavata*, *Zieglerodina zellmeri*, *Oulodus* sp., and *Belodella* sp. and those from the bottom of the middle part are *W. excavata*, “*Ozarkodina*” *parasnajdri*, and *Decoriconus fragilis*. The ranges of *Z. zellmeri* and “*O.*” *parasnajdri* are the lower Pridoli and the upper Ludlow to lower Pridoli, respectively. Therefore, the tentaculite black shale in this study is correlated to the Ludlow and lower Pridoli, Silurian.

Recently, Machida (2018MS) revised stratigraphy of a tentaculite shale in the Satun area, southern Thailand, and reconstructed its depositional environment. The tentaculite shale on the Malay Peninsula has been vaguely thought to be a result of some drastic environmental change during the Early to Middle Devonian, for example an opening the Paleo-Tethys. However, deposition of these shales may have been common occurrence during Silurian and Devonian. Stratigraphical reviews of these shales will serve to elucidate this problem.

Keywords: Silurian, Devonian, tentaculites