



Alatoconchid (Middle Permian) and *Lithiotis*-type (Early Jurassic) giant bivalves and their palaeoenvironmental regimes – preliminary comparative study

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ABSTRACT

Thailand has from west to east been divided into several terranes including the Gondwana-derived Sibumasu, the Inthanon, the Sukhothai and the Loei-Petchabun (Indochina composite terrane). During Middle Permian, all of these tectonic terranes were arrayed in the palaeotropical realm. Biostroms, a carbonate build-up with alatoconchid, a bizarre giant bivalve belonging to the Family Alatoconchidae is commonly observed. They have also been reported from other areas of tropical Tethyan shelf as well as palaeo-seamount in the equatorial Panthalassa Ocean. In the Loei-Petchabun Terrane, they seem to have preferred soft substrates as indicated by peloidal wackestone limestones. Their palaeoenvironmental setting was mid-ramp which is comparable to sheltered subtidal lagoon settings of rimmed platforms. The dark gray to black limestone matrix with very abundant fossils, especially giant fusulines, alatoconchid bivalves and massive rugose corals found, indicates shallow-water regimes with relatively high productivity. This facies can be correlated with alatoconchid bivalve biostromal facies described from the Permian Limestone of north Palawan Block, Philippines. In addition, it can be compared with subfacies C of the megalodont limestone of the Lofers facies in Dachsteinkalk in Northern Calcareous Alps (Austria). Occasional storm events were observed in some intervals indicated by tempestites including alatoconchid shell beds, reworked coral heads and fusuline storm sheets accumulated in the mid-ramp setting.

Recovery of marine fauna after Triassic/Jurassic mass extinction event was mainly marked by *Lithiotis*-type bivalve buildups distribution (e.g., *Lithiotis*, *Cochlearites*, *Lithioperla* and *Mytiloperla*). Huge, up to 40-50 cm long bivalves, which dominated within this so-called *Lithiotis*-facies, are the most significant representative of the buildup-makers of shallow marine/lagoonal bivalve mounds ("reefs"/buildups) in numerous places of Tethyan-Panthalassa margins during Pliensbachian-Early Toarcian times in subtropical climate zone. The world-wide distribution of these fauna indicates very rapid expansion of such type of bivalves along southern margin of the Neotethys – from northern Africa (Morocco) and southern Europe (Spain, Italy, Croatia, Slovenia, Albania and Greece), through westernmost Asia/Arabia (eastern Turkey, Iran, Iraq, Kuwait, Oman) to central Asia (India, Nepal, China), including so-called Kioto Carbonate Platform (carbonate sedimentation predominated along the southern Neotethyan margin). In several sections of mentioned regions these *Lithiotis*-type bivalves-bearing limestones are connected with oolitic/oncolitic carbonates (even mangrove-type environments - Albanian Alps) with restricted connections with full marine conditions. Preliminary comparative analysis of these Permian and Jurassic giant bivalves indicate similar palaeoecological regimes of their distribution in shallow-water (lagoon?) palaeoenvironments.