

## Carbonate sedimentation along southern margin of the Tethys with Lithiotis-type bivalves – similarities and differences



**Michał Krobicki<sup>1</sup>**, Maria Barbacka<sup>2,3</sup>, Jolanta Iwańczuk<sup>4</sup>, Marianna Kati<sup>5</sup>, Bardhyl Muceku<sup>6</sup>, Kabi Raj Paudyal<sup>7</sup>, Krzysztof Starzec<sup>1</sup>, Alexandra Zambetakis-Lekkas<sup>5</sup>

<sup>1</sup>Department of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology, Krakow, Poland

<sup>2</sup>Hungarian Natural History Museum, Botanical Department; Budapest, Hungary

<sup>3</sup>Polish Academy of Sciences, Kraków, Poland

<sup>4</sup>Polish Geological Institute – National Research Institute; Warszawa, Poland

<sup>5</sup>National and Kapodistrian University of Athens, Faculty of Geology and Geoenvironment, Athens, Greece

<sup>6</sup>Polytechnic University of Tirana, Faculty of Geology and Mines; Tirana, Albania

<sup>7</sup>Tribhuvan University, Central Department of Geology, Kirtipur, Kathmandu, Nepal

During Early Jurassic (Pliensbachian – Early Toarcian) times along southern margin of the Tethys Ocean, including peri-Gondwanan parts, Lithiotis-facies bivalves-bearing carbonates belt occur. The most characteristic bivalves which belong to this facies are: Lithiotis, Cochlearites, Lithioperna, Mytiloperna and Opisoma. This carbonate belt had very long distance, about 4000–5000 km, from Morocco trough south European up to Asian countries. Palaeogeographic distribution of this Lithiotis-facies generally occupied mentioned similar palaeoenvironments but in more detail reconstructions we can see some differentiation. Using comparative analysis between selected sections/regions, interpretation of these palaeoenvironments is the based on the: (i) Moroccan High Atlas sections, (ii) Albanian Alps section, (iii) southeastern Peloponnesus and Evvoia Island in Greece and (iv) Himalayan Nepalese Kali Gandaki valley.

(i) Lithiotis-bivalves bioconstructions in the High Atlas Mountains we studied in AssemSouk section in Jebel Azourki range. The Pliensbachian carbonate-clastic deposits is represented by record of regression manifested by continuous transition from shallow-water full marine limestones with corals trough lagoon-type calcareous-marly deposits with numerous bivalves mentioned above, up to nearshore clastic-carbonate deposits, with cross-bedding structures, and with plants which represent lagoonal-paralic environments.

(ii) In the Albanian Alps (N of Shkodra), within continuous section of the Late Triassic – Early Jurassic sequence the Early Jurassic part is represented by limestone-dominated deposits with several episodes of emersions marked by calcretes, fossil karst phenomena and extremally shallow-water environments (fenestrate limestones and/or tempestites). Overlying Lithiotis-type bivalves are represented both by parautochthonous and autochthonous concentration, including lens-shape bivalve biostromes (Pliensbachian in age). Bivalve-rich limetsones/marls are intercalated by oolitic/oncolitic layers. Several coal-bearing intercalations between intertidal carbonate rocks of full-marine–lagoonal–land transitional lithofacies occur with two aired roots horizons confirm occurrence of mangrove(?) palaeoenvironments of swamp formation.

(iii) The analyzed carbonate rocks occur in the southeastern Peloponnesus in Greece (Gavrovo-Tripolitza unit) and Evvoia island of the External and Internal Hellenides respectively. Lower part of these sequences comprises dolomites, dolomitic limestones and limestones representing subtidal and/or intertidal-supratidal facies in a shallowing-upward cyclic development. At a higher position there are exclusively open-marine subtidal limestones mainly represented by megalodontids (constructed sometimes storm-generated tempestites) and Lithiotis-type bivalves intercalated by ooid/oncoid-rich limestones.

(iv) Recently discovered Lithiotis-type bivalves in the Thakkhola region (northern central Nepal) occur here as a part of the so-called Kioto carbonate platform. In continuous section of clastic-carbonate formations of the Triassic/Jurassic transition is a record of a transgressive sequence of extremely shallow-marine – lagoon paleoenvironments with oolitic (with cross-bedding structures) and oncolitic limestones of the Pliensbachian/Early Toarcian Jomosom (= Kioto) Formation.

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