

Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 16	Graz 2011
IGCP 596 Opening Meeting		Graz, 19-24 <sup>th</sup> September 2011	

## Late Devonian pelagic carbonates in northwestern Thailand: constraints and plate tectonic implications based on a multidisciplinary approach

KÖNIGSHOF, P.<sup>1</sup>, SAVAGE, N.M.<sup>2</sup>, LUTAT, P.<sup>3</sup>, DOPIERALSKA, J.<sup>4</sup>, BELKA, Z.<sup>4</sup>, RACKI, G.<sup>5</sup> & SARSDUD, A.<sup>6</sup>

(1) Senckenberg - Forschungsinstitut und Naturmuseum, Senckenberganlage 15, 60325 Frankfurt, Germany; [peter.koenigshof@senckenberg.de](mailto:peter.koenigshof@senckenberg.de)

(2) Department of Geological Sciences, University of Oregon, Eugene Oregon 97405, USA; [nmsavage@uoregon.edu](mailto:nmsavage@uoregon.edu)

(3) Palaeontological Research and Education Centre, Mahasarakham University, Mahasarakham 44150, Thailand; [petra.l@msu.ac.th](mailto:petra.l@msu.ac.th)

(4) Isotope Laboratory, Adam Mickiewicz University, 61606 Poznan, Poland; [dopieralska@amu.edu.pl](mailto:dopieralska@amu.edu.pl), [zbelka@amu.edu.pl](mailto:zbelka@amu.edu.pl)

(5) Department of Earth Sciences, Silesian University, 41-200 Sosnowiec, Poland; [racki@twarda.pan.pl](mailto:racki@twarda.pan.pl)

(6) Sardud, Apsorn, Department of Mineral Resources, Geological Survey Division, Bangkok 10400, Thailand; [apsormsa@yahoo.com](mailto:apsormsa@yahoo.com)

Southeast Asia comprises a complex assembly of continental blocks, volcanic arcs, accreted continental crust, and suture zones which constitute remnants of the closed oceanic basins and it is widely accepted that the two principal microcontinents, Sibumasu in the west and Indochina in the east, had formerly been a part of Gondwana. The tectonic framework of Thailand is formed of four units; these are from west to east, the Sibumasu block, the Inthanon zone, the Sukhothai zone, and the Indochina block (e.g., METCALFE 2006, 2009, 2011, UENO 1999).

Detailed conodont stratigraphy, microfacies, isotope geochemistry (see contribution by SAVAGE *et al.*, this meeting) as well as Nd isotope studies have been undertaken in two Late Devonian sections in the northwestern part of Thailand. The Mae Sariang section is characterized by very homogenous light- to dark-grey well-bedded limestones. This 11 m thick sequence of Late Devonian very condensed limestones in northwestern Thailand exhibits faunal associations and sedimentological / microfacies criteria which are indicative for an isolated pelagic facies setting, most probably on a seamount. Similar sequences are known worldwide in a few sections only. The unique Mae Sariang section is characterised by low sedimentation rates as recognised by a number of hardgrounds, Fe/Mn crusts, and occurring phosphates. The sequence comprises a number of pelagic faunal elements e.g., conodonts, cephalopods and pelagic ostracodes. The fauna is composed of rare megafossils and the faunal diversity is low (KÖNIGSHOF *et al.* in press). The sequence also contains some Late Devonian events as shown by stratigraphical and geochemical results.

The Thong Pha Phum section which is located about 350km farther south is characterized by a different facies setting, suggesting a proximal position of the section on the shelf. Furthermore, we present Nd isotopic data measured from conodonts of the two sections. These data constitute the first Devonian seawater signatures recognized within the Australian shelf of northeastern Gondwana and in the adjacent Paleotethys Ocean. Although the conodont samples in the investigated sections were not exactly of the same age (in terms of the conodont zonation), they clearly reveal a fundamentally different Nd seawater composition at both sites. Based on a multidisciplinary approach the position of the two Late Devonian sections are discussed in the framework of existing plate tectonic models.

## References

- KÖNIGSHOF, P., SAVAGE, N., LUTAT, P., SARSDUD, A., DOPIERALSKA, J., BELKA, Z. & RACKI, G. (in press): Late Devonian sedimentary record of the Palaeotethys Ocean – the Mae Sariang succession, northwestern Thailand. - *Journal of Asian Earth Sciences*.
- METCALFE, I. (2006): Paleozoic and Mesozoic tectonic evolution and palaeogeography of East Asian crustal fragments: The Korean Peninsula in context. - *Gondwana Research*, 9: 24-46.
- METCALFE, I. (2009): An alternative plate tectonic model for the Palaeozoic-early Mesozoic Palaeotethyan evolution of Southeast Asia (northern Thailand-Burma); discussion. - *Tectonophysics*, 471: 329-332.
- METCALFE, I. (2011): Tectonic framework and Phanerozoic evolution of Sundaland. - *Gondwana Research*, 19: 3-21.

Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 16	Graz 2011
<i>IGCP 596 Opening Meeting</i>	Graz, 19-24 <sup>th</sup> September 2011		

UENO, K. (1999): Gondwana/Tethys divide in East Asia; solution from Late Paleozoic foraminiferal paleobiogeography. - *In*: RATANASTHIEN, B. & RIEB, S.L. (eds.): Proceedings of the International Symposium on Shallow Tethys (ST). - Chiang Mai University, Chiang Mai: 45-54.

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Berichte des Institutes für Geologie und Paläontologie der Karl-Franzens-Universität Graz](#)

Jahr/Year: 2011

Band/Volume: [16](#)

Autor(en)/Author(s): Königshof Peter, Savage N.M., Lutat Petra, Dopieralska J., Belka Zdzislaw, Racki G., Sardsud Apsorn

Artikel/Article: [Late Devonian pelagic carbonates in northwestern Thailand: constraints and plate tectonic implications based on a multidisciplinary approach. 61-62](#)