



## **Provenance of the Nam Duk Formation as an Indication for a Late Paleozoic orogenic Event in Mainland Thailand**

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With respect to the evolution of the mountain belts bordering the Khorat Plateau to the west, two scenarios have been proposed: The first scenario interprets the Permian strata of the Nam Duk Basin as a sequence deposited along a passive continental margin of the Indochina Craton with input of clastic material from the east. To the west of the margin, open oceanic conditions existed until Shan-Thai and Indochina collided along the Nan-Uttaradit Suture during the Upper Triassic. Deformation of Permian strata within the Nam Duk Basin occurred during the Upper Triassic Indosinian orogeny. The second scenario interprets the siliciclastic Permian strata of the Nam Duk Basin as syn- and late-orogenic sediments deposited in an external zone of a much larger Late Paleozoic orogeny situated to the west. The internal zone of this orogen would be expected to be the source area of the siliciclastics in the Nam Duk Basin. Siliciclastics provenance study of the Nam Duk Formation indicates an active continental margin and oceanic arc setting. The provenance signatures of sandstones and shales show indications of mafic igneous provenance in flysch and molasse sequences. This result would support the interpretation of a compressional deformation of the Nan-Uttaradit suture during the Middle Permian with subsequent uplift supplying the siliciclastic sediments into the Nam Duk Basin to the east. According to the Triassic geodynamic evolution, extensional basins are more likely created forming new depocenters in northern and central part of mainland Thailand.