

DISERTATION INFORMATION

Title: *Geology of the Upper Mesozoic Phu Quoc Basin in Southwest Vietnam*

Major: *Geology*

Major Code: *62520501*

PhD Candidate: *DAO VIET CANH*

Scientific Advisors: *1. Dr. Pham Huy Long*
2. Dr. Tran Anh Tu

University: *University of Technology, Vietnam National University HCM*

Research Objective is to clarify the geology, including stratigraphy, structure and tectonic evolution, of the Upper Mesozoic Phu Quoc Basin in Southwest Vietnam, as well as briefly evaluated the petroleum system.

Dissertation statements

✓ **Dissertation statement #1:** The Upper Mesozoic Phu Quoc Basin in Southwest Vietnam consists of the Duong Dong synthem. There are three seismic sequences, namely SQ3, SQ2 and SQ1, which were correlated to the Lower - Middle Jurassic Rach Gia formation ($J_{1-2} rg$), the Upper Jurassic - Lower Cretaceous Tho Chu formation ($J_3 - K_1 tc$) and the Upper Cretaceous Ham Ninh formation ($K_2 hn$), respectively.

✓ **Dissertation statement #2:** The Upper Mesozoic Phu Quoc basin in Southwest Vietnam was developed on the Chanthaburi magmatic arc, which was drifted from Indochina continental block, during the Late Carboniferous - Triassic. The basin had undergone under the contexts of intermontane basin during the Early - Middle Jurassic and backarc basin during the Late Jurassic - Cretaceous. During the Paleocene - Eocene, the basin was compressed, uplifted and eroded. During the Oligocene - Early Miocene, the southwest margin of the basin was strongly subsided while the northeast area was still uplifted and eroded. During the Middle Miocene to Quarternary, the basin was calmly subsided with transgression from the southwest to northeast area.

The originalities of the dissertation

- ✓ Newly established the Upper Mesozoic Duong Dong synthem.
- ✓ Newly established the Lower - Middle Jurassic Rach Gia formation.
- ✓ The lower section of the Tho Chu formation was encountered in PQ-X well. The Tho Chu formation which was previously established at Tho Chu archipelago (yet determined the upper and lower boundaries at the founding time) actually belongs to the lower part of this formation.
- ✓ The Ham Ninh formation which was previously established at Phu Quoc Island also distributes in the Tay Phu Quoc and the Tay Tho Chu synclines.
- ✓ Specifically delineated the boundary of the Upper Mesozoic Phu Quoc Basin in Southwest Vietnam; the major folds, such as longitudinal Tay Tho Chu syncline, Tho Chu anticline and Tay Phu Quoc syncline, northeast - southwest Nam Tho Chu anticline; high angle, longitudinal reverse and left lateral northwest - southeast strike slip fault systems.
- ✓ Additionally clarified lithology, silicate and geochemistry characteristics of the Hon Chuoi formation.

Scientific and Practical Contributions

Scientific Contributions:

- ✓ Establishing a new unconformity-bounded stratigraphic unit – ‘the Upper Mesozoic Duong Dong synthem’ in Southwest Vietnam had a vital role in solving stratigraphic issues while other stratigraphic categories are not fully applicable and unsatisfied in this area, thus, formed a foundation for correlation between seismic sequences and lithostratigraphic units within the Duong Dong synthem, as well as establishing new formation – the Lower - Middle Jurassic Rach Gia formation (J_{1-2} rg), contributing to clarify the stratigraphic relations and tectonic evolution of the Upper Mesozoic Phu Quoc basin in Southwest Vietnam.
- ✓ The study results also contribute to clarify tectonic evolution of the Southwest Vietnam area in the Late Mesozoic - Cenozoic.

Practical Contributions:

✓ The study results clarified the geology, including stratigraphy (classified stratigraphic units, their relation and characteristics), structure (fold and fault systems) and tectonic evolution of the Upper Mesozoic Phu Quoc Basin in Southwest Vietnam, as well as briefly evaluated petroleum system provide significant practical contributions to the detail petroleum system assessment of this basin.

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