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MAHASARAKHAM
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Final Circular

UNESCO Project IGCP-700

PALAEOZOIC CARBONATE BUILD-UPS IN SOUTH EAST ASIA

(**Year 1:** Meeting + fieldtrip training for students/academics and young geoscientists on Palaeozoic carbonate build-ups in Loei-Phetchabun fold belt and regional correlation)

13th - 16th December 2021

THAILAND

Website IGCP700

IGCP-700
PALAEOZOIC CARBONATE BUILD-UPS IN SOUTH EAST ASIA

Organized by

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Introduction

The study of limestones, particularly reef limestones requires bridging across disciplines and timescales in a comparative approach leading to the recognition of trends and patterns. Understanding of ecological changes of ancient reefs is also crucial to evaluate threats to modern coral reefs. The aims of the project are to integrate and synthesise information on Palaeozoic carbonate build-ups throughout South East Asia. Research will focus on the growth and demise of carbonate platforms, the distribution and geometry of build-ups, climate change vs. reef development, and framework-builders diversification in the Palaeozoic. Facies settings of interest will range from seamount carbonates to supratidal and shallow-subtidal environments. We will also address the economic potential of carbonates and thus the planned conference will be of interest for scientists as well as decision makers, politicians, and companies. Carbonates, particularly caves are very attractive for the general public, therefore we foster collaboration with geoparks.

Background

Limestones are well-known in South East Asia as extremely attractive karst areas for instance Hai Long Bay in the World Heritage area of Vietnam, in Krabi and Phang Nga in Thailand, in the UNESCO Geoparks in Langkawi, Satun and Dong Van (Malaysia, Thailand and Vietnam, respectively) and in the Kinta Valley (Malaysia) and Khammouane and Vang Vieng areas of Lao PDR. Apart from scenic beauty, all these areas and many more have caves that are both aesthetically attractive and have considerable actual and potential for palaeontological, palaeoclimatic, archaeological, historical and biological research. Limestones are also sites of large cement works and many karst areas are being or potentially will be destroyed by quarrying for cement (Kiernan, 2010). One aim of this project is to map areas of suitable quality limestone distant from tourist areas in order to help avoid conflict between the two important industries: tourism and construction. Limestone is important economically as host to very important mineral deposits (e.g. Devonian limestone of the Sepon copper-gold mine in Lao PDR, (Thassanapak et al., 2017) and to important petroleum accumulations such as the Permian limestone of North East Thailand (Booth and Sattayarak, 2011).

Limestones are scientifically important as they are important archives of palaeoclimatic and palaeoceanographic data, of palaeodiversity and as palaeogeographic features. South East Asia contains not only ancient tropical limestones but also cold water limestones (e.g. early Permian limestones in Malaysia and Thailand (Rao, 1996; Thassanapak et al., 2019). Platform limestones of various ages are widespread across South East Asia and occur in a variety of tectonic environments (e.g. Udchachon et al., 2013). How they accumulated and the controls from tectonic, biotic and palaeoclimatic factors are amongst the academic aims of this project. How the widespread platforms grew, laterally and vertically, how the carbonate factories kept-up with subsidence and the mystery of carbonate platform demise (Wilson et al., 2019) will be important considerations. These also have significant economic implications as platform growth and their palaeogeographic setting controls primary porosity and hence petroleum reservoir formation (e.g., Saw et al., 2019).

Important time

June 2021 – Open for registration and abstract submission (please visit our website for online registration)
15th November 2021 – Deadline for abstract submission
30th November 2021 – Final circular/online registration closes
13th-16th December 2021 – Annual meeting (inauguration)

Preliminary Programme

IGCP-700: PALAEOZOIC CARBONATE BUILD-UPS IN SOUTH EAST ASIA

Year 1: *Meeting + fieldtrip training for students/academics and young geoscientists on Palaeozoic carbonate build-ups in Loei-Phetchabun fold belt and regional correlations*

13th - 16th December 2021: First meeting (inauguration)/workshop/fieldtrip

Programme (Onsite/Online)

Online via Microsoft Teams; Thailand time = UTC+07.00

13th December 2021

MORNING SESSION: Plenary /special talk/workshop

- **Opening session/ Welcome speech/ Inaugural meeting (15 min)** **(start at 8.30)**
  By IGCP-700 project leaders and coordinators
- **Basic carbonate sedimentology, carbonate classification and depositional environments** (45 min)
  By Clive Burrett, Mongkol Udchachon, Hathaithip Thassanapak and Pradit Nulay
- **The spatial and temporal distribution of the Cambrian maze-like reefs in the North China Platform** (25 min)
  By Hao Xin and Jitao Chen
- **Paleomagnetism of the Late Paleozoic limestones of Indochina and its implications for the tectonic evolution of Paleo-Tethys** (25 min)
  By Yonggang Yan, Punya Charusiri, Baochun Huang and Peizhen Zhang
- **Timing of Upper Paleozoic carbonates build-ups along the Indochina margin of Thailand** (25 min)
  By Thasinee Charoentitirat

----------*Break (10.15)* ----------

- **Palaeozoic caves in Thailand** (30 min) **(start at 10.25)**
  By Chaiporn Siripornpibul
- **Reviews of Permian foraminiferal faunas and petrography of carbonate rocks in Kanchanaburi, Western Thailand** (25 min)
  By Panus Hong
- **A preliminary result on the study of smaller foraminifers and algae from the Middle to Upper Permian (Midian-Dzhulfian) carbonate rocks of the Sai Yok District, Kanchanaburi Province, Western Thailand** (25 min)
  By Kantanat Trakunweerayut

Poster presentation:

- **Carbonate platform development of Wang Sa Phung Formation in Loei province, Thailand** (20 min)
  By Piyatida Sangtong

AFTERNOON SESSION: Plenary /special talk/workshop

- **Reefs and microbialites** (50 min) **(start at 13.00)**
  By Stephen Kershaw
- **Initiation and demise of carbonate build-ups from platforms to seamounts – examples from mainland SE Asia and global comparisons** (45 min)
  By Clive Burrett
- **Sedimentary records of the highest sea level of the Paleozoic: from the perspective of the middle–late Ordovician carbonates in South China and Sibumasu** (30 min)
  By Wenjie Li and Jitao Chen

----------*Break (15.05)*----------

- **Dynamics of Devonian carbonate platform development and evolution in South China: Insights from cycle and sequence stratigraphy** (30 min) **(start at 15.15)**
  By Daizhao Chen
- **The Bayankhoshuu Ruins section in the southern Gobi of Mongolia revisited: new sedimentological/facies data** (25 min)
  By Ariuntogos Munkhjargal
- **Sedimentology and carbonate δ13C of the late Carboniferous to early Permian carbonate slope successions in South China: insight into icehouse to greenhouse transition** (25 min)
  By Wenli Yang and Jitao Chen
- **Permo-Carboniferous sequences from the Shan Plateau, Myanmar in the Sibumasu Blocks and their paleogeographic implications** (25 min)
  By Kyi Pyar Aung and Than Zaw

----------*Break (17.00)*----------

- **Middle Permian brachiopods from central Thailand and western Cambodia and their faunal correlations over the pre-Indosinian carbonate platform of the Indochina Block** (30 min) **(start at 17.10)**
  By Masatoshi Sone
- **Alatoconchid (Middle Permian) and Lithiotis-type (Early Jurassic) giant bivalves and their palaeoenvironmetal regimes – preliminary comparative study** (30 min)
  By Michał Krobicki and Mongkol Udchachon
- **Records of Permian ostracods from Pha Nok Khao Platform, northeastern Thailand** (25 min)
  By Anisong Chitnarin, Phattraporn Kulnok, Sataporn Kongsat and Prachya Tepnaron
- **Origin of huge carbonate accumulated near the orogen—A Cretaceous case study from central Tibet** (25 min)
  By Yiwei XU and Jitao Chen

----------*End of Online Presentation*----------

14th December 2021

MORNING SESSION: Fieldtrip/workshop on geology along the Mekong River and the mid-Palaeozoic stromatoporoid-coral reef

- Review on the general geology, stratigraphy and palaeontology of the Loei region
- Evidence of uplift during the Mississippian (?Visean): Carboniferous sequences along the road next to the Mekong River from Chiang Khan to Pak Chom including the siliciclastic, chert and carbonate sequences indication of deep marine, slope, shallow marine and terrestrials.
- Mid-Palaeozoic build-ups of Indochina: Middle Devonian reef with spectacular faunas including corals, stromatoporoids, crinoids and others
- ? Eustatic sea-level change or local tectonics: Late Devonian deep marine chert with siliciclastics and volcanic rocks

AFTERNOON SESSION: Fieldtrip/workshop along the Loei-Phetchabun fold belt visiting Carboniferous-Permian carbonate sections and build-ups in Loei and nearby areas (Pha Nok Khao Platform)

- Permian carbonate at the Phu Pha Lom (National) Park and nearby Carboniferous siliciclastic and carbonate sequences with fossil wood fragments, fusulinids, brachiopods and others

15th December 2021

MORNING SESSION: Fieldtrip/workshop along the Loei-Phetchabun fold belt visiting Carboniferous-Permian carbonate platform, slope and basin sections in Loei and nearby areas

- Peritidal carbonate sequence (Carboniferous/Permian) with useful structures
- Biostrome (Carboniferous/Permian); local build-up with algal stromatolites, crinoids, fusulinids and others

AFTERNOON SESSION: Fieldtrip/workshop along the Loei-Phetchabun fold belt visiting Carboniferous-Permian carbonate sections and buildups in Loei and nearby areas

- Permian basin/slope/platform in the Wang Saphung to the Pha Nok Khao areas

16th December 2021

Conclusion of the annual meeting, planning and business meeting

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Preliminary programme for summer 2022

- Fieldtrip/workshop on Carboniferous-Permian carbonate sections in Phetchabun and nearby areas (Phetchabun Geopark)
- Fieldtrip/workshop on carbonate development and spectacular mid-Permian (bivalve) build-ups and the end of Palaeozoic carbonate platform in central Thailand in Lopburi and nearby areas
- Fieldtrip/workshop on Permian carbonate platform, slope and basin sections of the Khao Khwang Platform in Lopburi and Saraburi and Pak Chong (Khorat)
- Regional correlation and synthesis
- Education for general public and geoparks

Location of major field activities

After one-day meeting, fieldtrip has been planned to conduct along the Loei-Phetchabun fold belt in NE to Central Thailand including Loei and nearby areas to the north (for Silurian through Permian carbonate build-ups) and Phetchabun, Lopburi and Saraburi to the south for visiting late Palaeozoic build-ups and the proposed Phetchabun Geopark with field carbonate short course/workshop led by prominent carbonate workers from developed world. The course includes basic concept and application for both academic knowledge and economic benefit for students/academics and geoscientists on

1. Carbonate sedimentology
2. Palaeontology and biostratigraphy
3. Carbonate depositional environments
4. Regional stratigraphic correlation and mapping of the carbonate sequences in SE ASIA
5. Caves and karstification
6. Education for general public and geoparks

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