

On 22nd June 2019, the 3rd progress meeting of the Batu Caves Scientific Expedition participants was held at the Malaysian Nature Society (MNS) Auditorium. Nine participants attended the meeting and provided an update on their current progress while other participants who could not attend submitted their report to the Malaysian Cave & Karst Conservancy (MCKC) Executive Secretary. The meeting began with a report from Dr Choong on Odonata. To date, two field surveys were conducted around aquatic habitats in the Gua Damai area. 25 species from 4 families (5 damselfly species and 20 dragonfly species) were recorded. He also explained that female individuals of *Ischnura senegalensis* have three different colour forms while male individual only has one. It exhibits sexual mimicry where one group mimics the males' colour while another group have their own female colouration.

Next, Dr. Teo Eng Wah (Vincent) gave an update on the herpetofauna study. He has conducted two trips around Damai. Steven and Dr. Vincent reported a changeable lizard (*Calotes versicolor*) at Damai car park area. Other than that, he reported a male Wagler's Pit Viper found in the Damai area on 21st May and he was called to identify a Malayan Racer by Zarris Kem. Their day observations have covered most places around Batu Caves. The herpetofauna team will conduct a night survey for their next survey trip.

The serow research was conducted by the team from PERHILITAN led by Puan Noraini. Puan Noraini reported six camera traps were installed at Batu Caves and they plan to fly a drone to survey the population of serow at Batu Caves. Puan Noraini will share the results once they take out the camera trap on the next sampling trip.

Dr. Nur Atiqah from bat research team updated that 12 bat species have been recorded so far and five species (*Hipposideros kunzi*, *H. cineraceus*, *Rhinolophus stheno*, *Emballonura monticola* and *Cynopterus brachyotis*) were not listed in Max Moseley et al. (2012) on fauna at Batu Caves. Thus, this finding adds to the list of bat species previously recorded.

Meanwhile for lepidoptera, Dr Rosli spotted 27 species of lepidoptera and has 2 unidentified butterfly photos. Butterflies in Batu caves are a mix of secondary forest and open area species. In addition, based on Sofwan's observation, one species of butterfly caught his attention during the visit to the burnt area. The smaller wood nymph (*Ideopsis gaura*) butterfly was spotted somewhere before they reached the peak. This butterfly is a forest species and also a hill/mountain species. It is a good but not the best indicator to determine that the forest is springing back to its original condition. In Dr Rosli's pictures there aren't any pictures of this species, but Dr. Nur Atiqah did spot a hindwing before on the ground in Gua Belah. Thus, this is a new live record.

Priscilla Miard from Universiti Sains Malaysia did 3 days survey focusing on nocturnal animals at the Gua Damai trail, Taman raintree roadside and old quarry area. Around 15 different animals were sighted or heard during the survey including sunda scoop owl, collared scap owl, brown hawk-owl, common palm civet, serow, great argus, dusky leaf monkey, malayan box terrapin, long tail giant rat and others. This is a very interesting discoveries and shows Batu Caves holds very unique and important biodiversity that need to be conserved.

The flora team headed by Dr Ruth Kiew went to Pandan Cave to collect plant samples and *Epithema* seed for tissue culture. Ethan Cheah Yih Horng, recorded a clump of the orchid, *Trichoglottis* sp. was seen growing on the rock surface, rooting in the crevices, upon reaching the cave mouth. There, several individuals of the Batu Caves balsam *Impatiens ridleyi* were seen growing at the cave mouth and overlooking the gully were many Pandanus plants. On the wall of the cave mouth, he found an interesting fern *Tectaria* sp. which mingled with the limestone dweller, *Adiantum malesianum*. Not collected from any other part of Batu Caves, this *Tectaria* sp. could be a new record for Selangor. Moving further from the cave mouth, a patch of flowering one-leaf plant *Monophyllaea hirticalyx*, a limestone specialist, grew on the cave floor. There weren't any other flowering plants seen growing inside the cave besides *Impatiens* and *Monophyllaea*, nevertheless, an interesting thalloid liverwort was seen covering the base of a huge rock, which measured to about 2 m tall. This liverwort, *Cyathodium* sp. (Cyathodiaceae) grew furthest most from the cave mouth. It has light green or fluorescent green thallus that glistened in the cave.

The geologist, Dr Ros Fatimah has recognized three levels of caves which are low (Villa Cave, Ichibawa Cave & Swamp Cave), middle (Cistern Cave & Dark Cave) and high level (Temple Cave, Fig Tree Cave and Cllipadi Cave) with distinct morphology. Fig tree cave shows important roof features of bell holes, that either indicate the effect on bat activity (based on studies in the Mediterranean caves) or a hypothesis of dissolution by hydrothermal water. Similar features but with elongated shapes, that follows the structural trend are also found in Fig tree cave. Besides, there are also layers of clastic sediments in the Fig Tree cave, with calcite layers, indicating old depositional process. Moreover, according to Dr Ros, Batu Caves is an important Quaternary paleontology site with the first report of Pleistocene Orangutan (dated 66-500k years by Yasamin et al. 2013). Ichibawa Cave is located at about 5m below the general ground level and sediments in the form of breccia, believed to be brought in by a stream. Brief observations have uncovered 3 teeth, and a bone cemented on walls in Ichibawa Cave and Dr. Ros Fatimah believes Fig Tree cave and Icibawa cave are good potentials for Quaternary paleontology.

Six months of Batu Caves Scientific Expedition progresses productively. Due to more sites that need to be surveyed, MCKC is extending the Batu Caves Scientific Expedition until December 2019 with the approval and support from Majlis Perbandaran Selayang. Malaysian Cave & Karst Conservancy is highly appreciative of everyone's contribution, commitment, time, and expertise that has made this scientific expedition a success. Looking forward for more discoveries! Many thanks to everyone.

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Malaysian Cave and Karst Conservancy/Friends of Batu Caves



Uncommon sp : *Ceragrion chaoi*,  
Photo by C.Y Choong ©



Uncommon sp: *Camacinia gigantea*,  
Photo by C. Y. Choong ©



*Hipposideros cineraceus*,  
Juliana S. ©



*Hipposideros kunzi*,  
Juliana S. ©



*Rhinolophus stheno*,  
Juliana S. ©



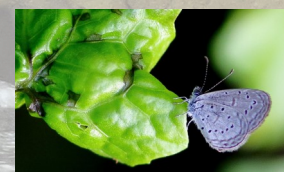
*Cynopterus brachyotis*,  
Juliana S. ©



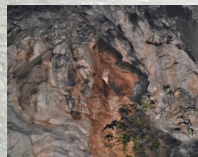
*Emballonura monticola*  
Juliana S. ©



*Dryas julia*, an alien species,  
Rosli Omar ©



*Zizula hylax pygmaea*, smallest butterfly  
in Peninsular Malaysia, Rosli Omar ©



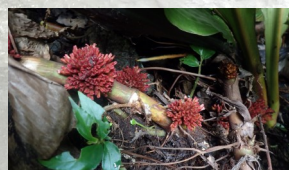
Barn owl spotted on the hill,  
Prscilla M. ©



Malayan box terrapin,  
Priscilla M ©



Common palm civet,  
Priscilla M ©



*Amischotolype monosperma*. Only found in  
the damp shaded gullies, Batu Caves  
Yee, C. W. ©



The endemic *Epithema parvibracteata*,  
Yee C. W. ©



Bell-holes feature in Pokok Ara (in red mark),  
Nuratiqah A.R ©



The 3rd Batu Caves Scientific Expedition progress meeting attendees  
From left: Azmina, Sakina, Dr. Juliana, Pasupathy, Dr. Choong, Dr. Zubaid,  
Dr. Vincent, Puan Noraini, Dr. Nur Atiqah