

Project Update: November 2016

We conducted field work in Lower Kinabatangan, Sabah, Malaysian Borneo in order to carry out a study of cave biodiversity conservation. Our task was to locate and explore caves on several limestone hills on Lower Kinabatangan and to gather data on richness and endemism of cave snails and cave beetles to be applied in the conservation of these threatened ecosystems.

The outcomes of this research:

1. Exploration of eight caves from which all of them were discovered on this field work

We explored eight caves: Gua Babi, Gua Ikan, Gua Fico, Gua Ular, Gua Kolam, Gua Lumpur, Gua Merayar, Gua Cendawan Bi) on the limestone outcrops in Lower Kinabatangan. All caves in Lower Kinabatangan were explored for the first time and since most of them were discovered on this field work we named them in the agreement with our local guides. Seven out of eight caves in Lower Kinabatangan were discovered on the hill Batu Batangan and one cave (Gua Fico) were discovered on the „New hill 2“ (Fig. 1). Locations of these caves are particularly important for future karst work in Sabah and databasing not only speleological sites but also karst biodiversity that will allow us to suggest species for IUCN Red List.



Fig. 1. Limestone outcrops („hills“) in Lower Kinabatangan.

2. Discovery of new species of the genus *Ptomaphaminus*

A new species of the genus *Ptomaphaminus* (Coleoptera, Leiodidae) was collected in the cave Gua Fico (Lower Kinabatangan) and is about to be described (Figs. 2, 3). We are currently working on the paper „A review of the Cholevinae (Coleoptera: Leiodidae) from the island of Borneo“ where this species will be described.



Fig. 2. Entrance of the Gua Fico, a cave where a new species of the genus *Ptomaphaminus* was found.



Fig. 3. *Ptomaphaminus* sp.nov. from Gua Fico, Lower Kinabatangan, Sabah; scale bar 1mm.

3. Database of cave biodiversity

Beside cave snails and cave leiodids who were main focus of this research, several other invertebrate groups were also collected: Aranea, Opiliones, Diplopoda, Isopoda, Collembola, Hymenoptera and Coleoptera. All aforementioned groups are in the different stages of identification. Cave snails collected on this field work belonged to the following genera: *Allopeas*, *Acmella* (Fig. 4.) and *Arinia*. Material was collected by hand and by pitfall traps which are standard methods of collecting in caves. The list of the collected material and localities will be given in the Final Report.

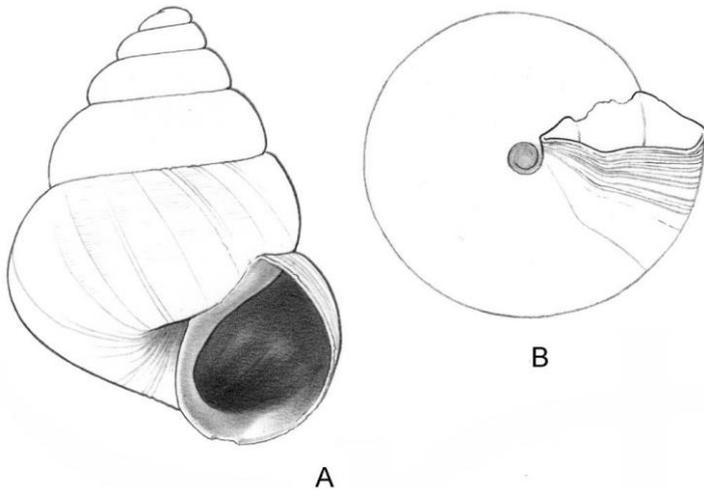


Fig. 4. *Acmella polita* Von Moellendorff, 1887. **3A** Frontal view, shell 2.3 mm high **3B** Umbilical view (from: Vermuelen at al., 2015).

4. Vulnerability of explored cave habitats is estimated in order to ensure effective conservation

Caves on Lower Kinabatangan are between 20 and 40m long and located on the foot of the limestone outcrops which makes their fauna particularly endangered by pesticides draining from palm oil plantages. Limestone outcrops where these caves were located are in average a few dozen metres long and are separated from one another by tens of km of non-calcareous terrain which make their fauna extremely vulnerable. There is no data about previous speleological or biospeleological research of the Lower Kinabatangan. Therefore, the data gathered during this field work present the first step towards more comprehensive and focused research that will be continued in this area in the future and contribute to the conservation of these threatened karst habitats.