



NAGALAND CAVING EXPEDITION

2022 - 2023

PUNGRO/MIMI - KIPHIRE DISTR. NAGALAND
NORTH-EAST INDIA 19/12/22 - 06/01/23



SUPPORTED BY:





EXPEDITION REPORT



Richard Hudson rigging Salomi Cave

Photo by Aush Singh 2022

Authors	Thomas Arbenz Dan B. Harries Tudor L. Tamas Roman Hapka Oliver Legg Richard Hudson David Cooke Pynshailang Syiemiong Ayush Singh	Editor, general text, cave maps, descriptions Biospeleological Report Geological Report, cave maps, descriptions Archaeological Report, cave maps Surface maps, GPS Locations Cave Maps, cave descriptions Cave Maps, cave descriptions Cave Maps, cave descriptions Introduction
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EXPEDITION ROUND-UP

12 CAVING DAYS

13 CAVERS

33 CAVES SURVEYED

TOTAL SCORE 1.8 Km

LONGEST and DEPEST CAVE:

KIJINGVONG LONG NKHUN, SALOMI 335m LONG and 115m DEEP.

TEAM

[12] Daniel B. Harries UK (Leader)

[7] Ayush Singh IND (Co-Leader), [8] Thomas Arbenz CH (Co-Leader)

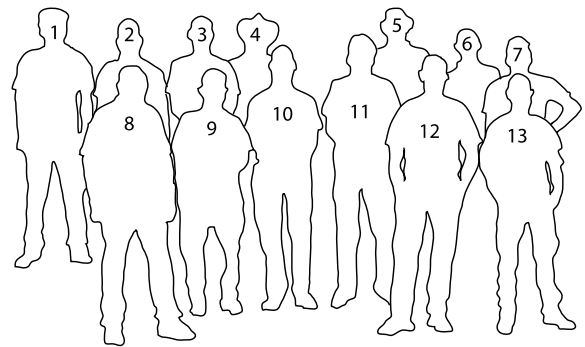
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[13] Kit Wann IND (Meghalaya), [9] Amos Keneizekho, IND (Nagaland),

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GUIDES, Salomi

Athong, Tsuamthong (Salomi Students Union)

GUIDES, Mimi

Ruthsiwong (VCC), Kiutsü, Nusetsu (Tigerman), Tsantsumong, Jiwong, Pongkhen, Holim, Limsangwo (Caveman), Tangmuli, Tsüthrong, Liji.

STAFF

Thorngki, Kamjila, Khongyamong, Jijhemji.

SPECIAL THANKS TO

Heika (Khonoma), Tsulimew (Pungro), VCC Ruthsiwong Achimpong (Mimi), Capt. Nitin Singh Tanwar (Assam Rifles) and the Village Council and people of Mimi.

INTRODUCTION

Ayush Singh, Expedition Co-Leader N.E.I.C.E, India

In the spring of 2021, an interesting piece of information regarding the Yimchungrü tribe in eastern Nagaland came across. The tribe has an annual bat harvest festival in a village of the Kiphire District known as Mimi. Based on experience from former expeditions in Meghalaya, the connection “bats = caves” was only logic. Further investigations revealed that there are indeed caves in that region, possibly some resurgence areas as well. This was enough to plan a visit to the area close to the Indo-Myanmar border and so, within a few months, a recce was planned and along with three Naga guides we made our way to Mimi village. Getting there was arduous to say the least, it took a 2-day journey to break the 20-hour dirt track drive.

The tribe was very welcoming and soon the village council designated some local hunters to show us several caves. They brought us to 5 known caves, which had already been visited by Dr Tiatoshi Jamir, the Naga Archaeologist who had done substantial archaeological research and documentation in the region. Apart from the known caves, the mountainous region showed plenty of limestone cliffs and outcrops. We descended parts of a canyon in limestone and climbed the highest point in the area, Psykhatsü mountain at 1800 m which again was all limestone. The positive outcome of the recce convinced us that there was great potential for caves around Mimi.

Back from the trip, we were able to back-up our information with some more details about the region like geology, archaeology and a survey by the Mineral Energy Corporation of India which showed a large tract of limestone extending several kilometres to north and south from Mimi. The fact that the highest limestone patch and the river valley are some 1200 vertical meters, along with the unique aspect of the cultural integration of caves in the Yimchungrü folklore, was a very exciting prospect. And, of course, the remoteness of the region excited the explorers within us.

After careful consideration and detailed discussions with the expedition core-team, it was decided that a speleological expedition with relevant field experts needed to happen, in order to survey and document the known caves and explore the big system potential of the region.

As a consequence, the expedition took place over Christmas – New Year 2022/2023. Motivated by the spirit of exploration that the caving community thrives on, our team of 13 cavers made its way to the Karst region of Northeast Nagaland adjoining the Myanmar Border for a first of its kind caving expedition. The team consisted of biologists, geologists, archaeologists, surveyors, researchers, explorers and riggers, but all cavers. With a common objective of documenting the unseen and unknown, we made it to Mimi, our area of focus. Over the period of 3 weeks, the team was able to explore and survey 33 caves, deepest being 85 meters and longest being close to 350 meters. It's still a while before all the collected data will be processed and tell us more about the findings. Though, it is evident that it will help us to create cross disciplinary portraits of these virgin caves and eventually contribute to a better understanding of our ecosystems.

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OVERVIEW / GEOGRAPHY

Nagaland, state of India, lies in the hills and mountains of north-eastern part of the country. It is one of the smaller states of India. Nagaland is bounded by the Indian states of Arunachal Pradesh to the northeast, Manipur to the south, and Assam to the west and northwest. To the east it forms the border with the country of Myanmar (Burma). The state capital is Kohima, located in the southern part of Nagaland.

Nearly all of Nagaland is mountainous. In the north the Naga Hills rise steeply from the Brahmaputra valley to about 600 metres and then increase in elevation toward the southeast to more than 1800 metres. The mountains merge with the Patkai Range, part of the Arakan system, along the Myanmar border, reaching a maximum height of 3826 metres at Mount Saramati.

The country is deeply dissected by rivers: the Doyang and Dikhu in the north, the Barak in the southwest, and the tributaries of the Chindwin River (in Myanmar) in the southeast. Nagaland has a monsoonal climate. The annual rainfall averages between 1800 and 2500 mm and is concentrated in the months of the southwest monsoon (May to September).

The average temperatures decrease with greater elevation: in summer temperatures range from about 21-23 °C to about 38-40 °C, while in winter they rarely drop below 4 °C, though frost is common at higher elevations. Humidity levels are generally high throughout the state. [after: *nsdma.nagaland.gov.in* (accessed 04/2021)]



Pungro, overlooking Likimro Valley

Photo by Pynshai Syiemiong, 2023

KIPHIRE DISTRICT

The caves explored and documented during the 2023 expedition all lie in the district of Kiphire, 250 km north east of Kohima. Situated in the eastern most part of Nagaland it is part of the Indio-Myanmar border and neighboured by the Naga-Districts of Phek, Zunheboto and Tuensang.

As all districts of Nagaland, Kiphire has a tribal culture. The main tribes are Sangtam, Yimchungrü, and Sümi. Besides these, there are several sub-tribes speaking various languages. With the majority of the people living in the rural villages, agriculture is the main occupation of the people of the district. The primary mode of agricultural practice is jhum, also known as slash & burn method of cultivation. The main crops grown in the jhum are largely traditional crops such as upland rice, maize, millet and jobs tears and varieties of beans. In colder regions such as the foothills of Saramati Mountain, fruit like apple, orange, mango, guava, and banana are grown in abundance. Transport, trade and Tourism are growing segments of income, industry is mostly represented by hydro-electric plants.

SALOMI

Salomi village, inhabited by the Sangtam tribe, is located in the Khongsa Circle of the Kiphire District, right across the eastern border of the Pungro Circle (N25°47'30" / E94°53'35" / 1860 m asl). It is situated 15 km away from Pungro and 75 km away from the district headquarter Kiphire. Salomi has a population of about 2000 people, living in 420 households.

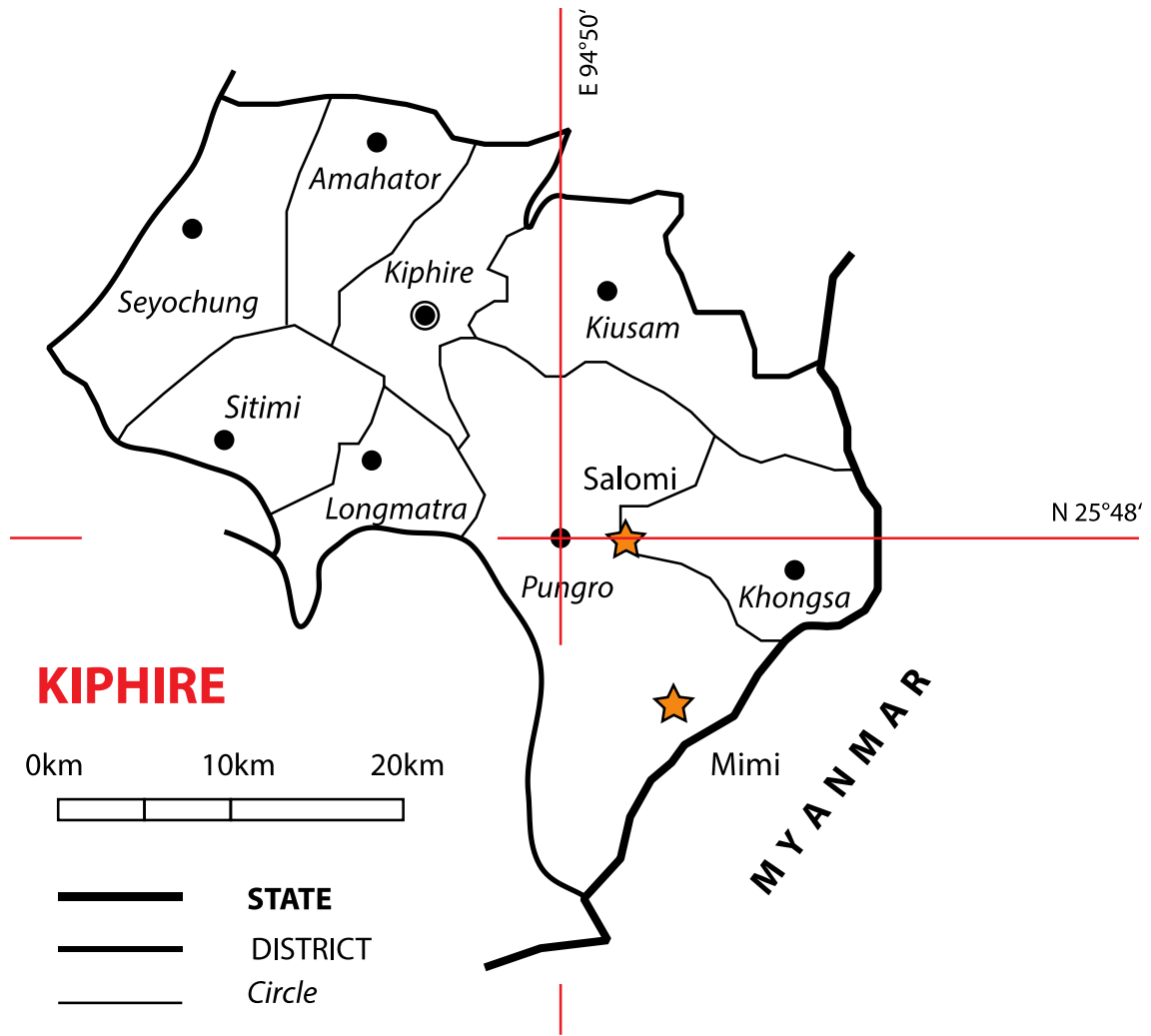
There are 3 known caves in Salomi, but with Kijingvong Khun Salomi has the longest cave in the Kiphire District (335 m). Under the name of Salomi Cave it is touristically exploited by the Salomi Student's Union, which provides guides and information to the visitors. As all cave explorers, regardless their status, have to get permission from the Students Union for entering the caves of Salomi and always have to take a guide, the caves are well protected and looked after.

MIMI

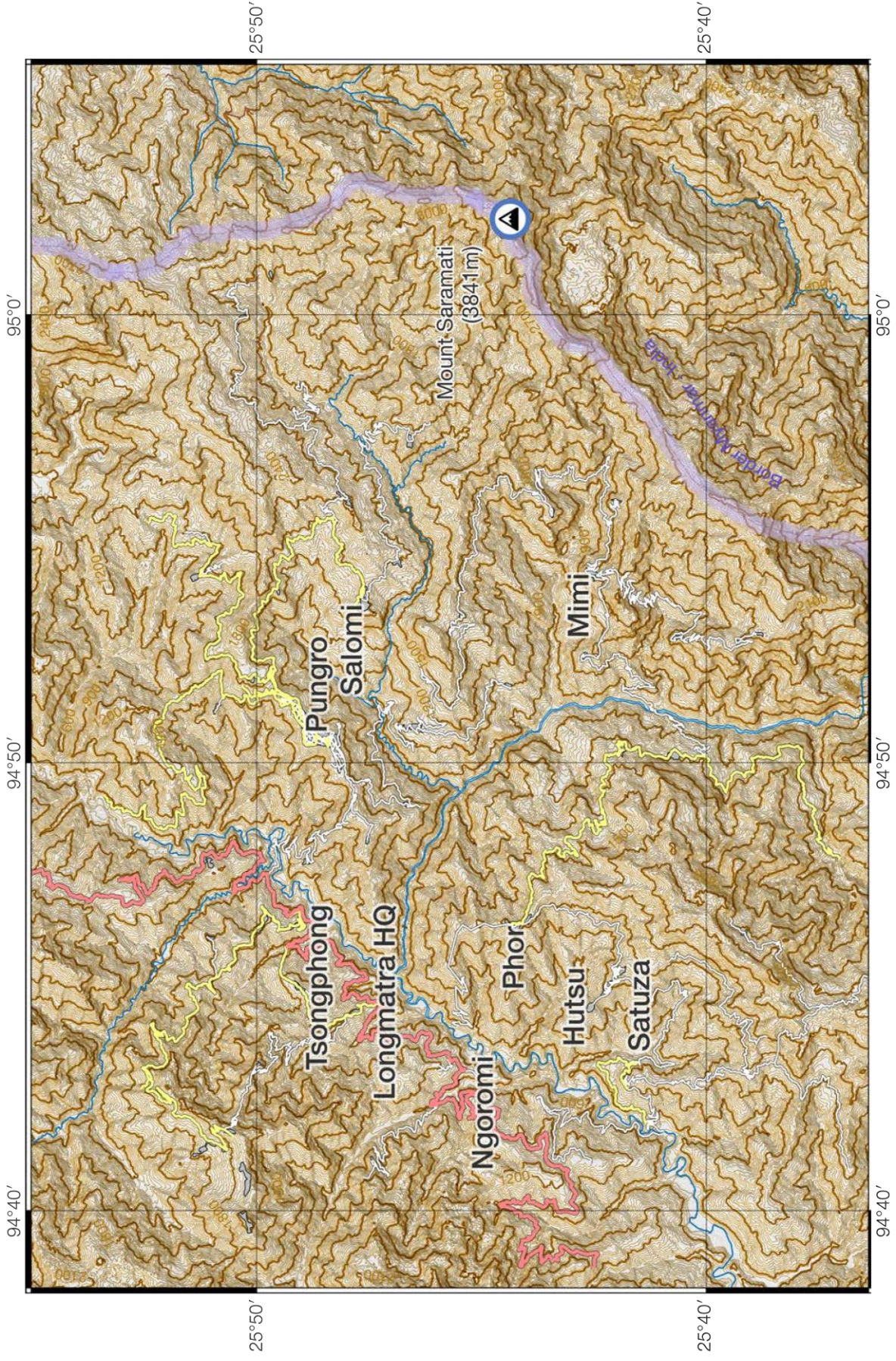
Mimi village is located in the Pungro Circle of the Kiphire District, at E25°42'30" / N94°54'20" / 1550 m asl). It is situated 40 km away from the circle headquarter Pungro and 135 km away from the district headquarter Kiphire. The majority of the indigenous population belong to the Yimchungrü tribe and the dominant clans are Whourr, Merr and Bomrr. Mimi has a population of about 700 people, living in 170 households.

On their terrain Mimi hosts a military base of the Assam Rifles (AR), an Indian government-controlled paramilitary force responsible for border security, counter-insurgency and law and order in Northeast India. It guards the Indo - Myanmar border, which is just 10 km distant from Mimi. As a benefit the base supplies medical and logistic support to the village. Visitors to the area need a permit from AR and are requested to report at the Mimi Base on arrival. On-road checks are frequent.

Like most of the villages in this district, Mimi is situated on the sunny high reaches of a ridge, well above the fog in the valleys that surround it. However, accessible only by steep and winding dirt roads, it takes the better part of two days to reach it from Dimapur airport. The last bit of the journey, starting from Pungro, requires 4WD vehicles and a drive of up to 6 hours. Apart from minor obstacles two river fords and several stretches of deep mud have to be tackled – during monsoon time the road is frequently unpassable.



Overview



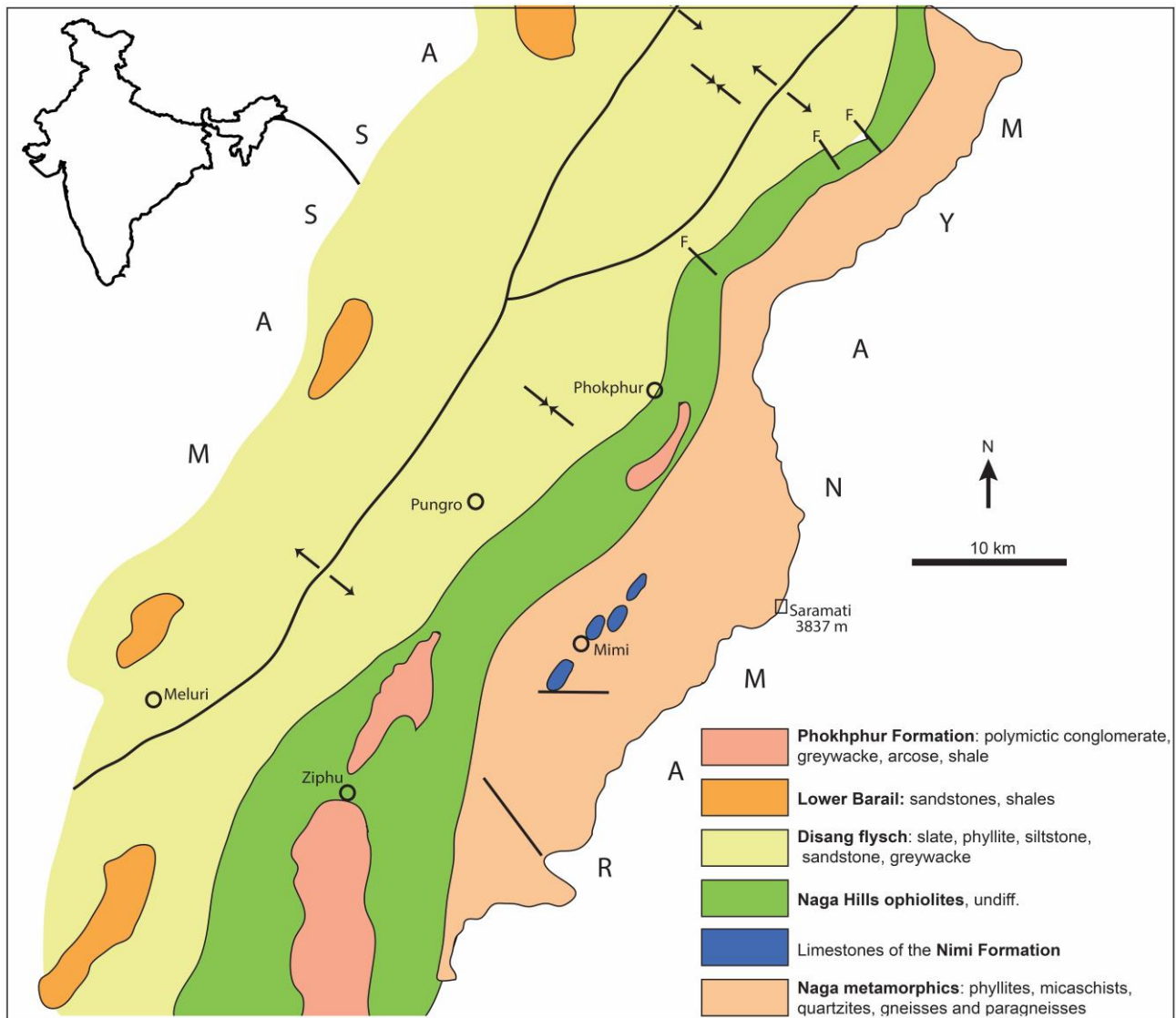
GEOLOGY

Tudor Tămaş – Babeş-Bolyai University, Cluj, Romania

Limestone is mainly present along the eastern border of Nagaland, concentrated in the south eastern districts of Phek, Kiphire and Nokhlak. The Caves of Mimi (Kiphire District) are set in the crystalline limestone bands of the **Nimi (Mimi) formation**, neighbouring the Naga Hills ophiolite suite and the Naga metamorphics of the Saramati area and along the border with Myanmar.

From a stratigraphic point of view, most of Nagaland consists, from east to west, of the following units:

- 1 the Naga metamorphics (Brunnschweiler 1966);
- 2 the Naga Hills ophiolites (Nagaland - Manipur ophiolites);
- 3 the sedimentary rocks unconformably overlying the ophiolites, termed the 'Phokphur formation' (Vidyadharan et al 1986);
- 4 Disang formation (turbidites lying west of the ophiolite suite);
- 5 Barail formation.



Geological map of Nagaland showing the main units mentioned in the text (simplified after Ghose et al. 2014).

The Naga Metamorphics occur along the eastern border of India with Myanmar, together with the overlying Nimi formation. They consist largely of phyllites, micaschists, quartzites, marble, gneisses and paragneisses with garnet (Acharyya et al., 1986b). Brunnschweiler (1966) proposed for them a pre-Mesozoic age, but there have been no fossils found. These rocks form a nappe overthrusting the Naga Hills ophiolites along the Saramatim thrust. U-Pb ages for zircons extracted from these rocks give an Early Ordovician age for the Naga Metamorphics (Aitkinson et al. 2019).

The Nimi Formation is a folded and deformed sequence consisting mainly of phyllite, quartzite and limestones which unconformably overlies the Naga metamorphics (Acharyya 2007). Based on a mention of *Orbitolina* found in the limestones (Soonwal and Bhattacharya, pers. comm. in Acharyya et al. 1986b), various authors (e.g. Acharyya 2007; Chatterjee and Ghose 2010; Maibam et al. 2023) attribute it a mid-Cretaceous age.

The Naga Hills ophiolites form a nappe that is overthrust by the Naga Metamorphics and is thrust over the clastic rocks of the Eocene Disang Formation. In the Naga Hills, the ophiolites are locally about 200 km wide (Acharyya 2007). Volcanic rocks within the Naga Hills ophiolites include basaltic and pillow lavas, felsic intrusives and plagiogranites, while harzburgite, gabbro, pyroxenite, dunite and garnet-bearing lherzolite are widespread (Ghose et al. 2010). These are intercalated with oceanic sediments (chert, limestone) containing radiolaria of Late Jurassic (Tithonian) age (Baxter et al., 2011).

The Phokphur formation is an ophiolite-derived polymictic conglomerate overlying the ophiolites. The conglomerates are over 700 m thick and contain a wide variety of clasts including serpentinite, gabbro, basalt, chert, quartz, sandstone and phyllite. The conglomerates are reddish due to the presence of oxidised iron in their matrix/cement (Vidyadharan et al. 1986, Ghose et al., 2014). Acharyya et al. (1986b) assigned it a Late Eocene-Oligocene age based on scarce fossil assemblages.

The Disang formation is a thick (~3000 m) flysch sequence exposed to the west of the ophiolites (Ghose et al., 2010), forming a part of the Kohima synclinorium (Agrawal and Ghose 1986). It consists of alternations of shale, fine grained sandstone and siltstone with minor phyllite and quartzite (Acharyya et al., 1986a, Ghose et al., 2014). Acharyya et al. (1986a) suggested a Late Cretaceous to Late Eocene age based on analysis of bivalves, gastropods and foraminifera.

The Barail Group overlies the Disang Formation. The unit is composed of medium to coarse grained sandstone with minor siltstone and shale, forming a lower sandstone-dominated unit and an upper, rather argillaceous facies (Acharyya et al., 1986a). Occasionally, thin bands of carbonaceous shale and coal occur in pockets within the shale as well as the sandstone units. The basinal areas during the deposition of the Barail intermittently witnessed shallow marine, lagoonal and deltaic and estuarine environment. The Barail is generally regarded as Oligocene in age but Middle Eocene marine fauna, as well as plant remains have also been recorded (Mandal 1996). The Barail sediments are unconformably overlain by the molasse sediments known as the Surmas and Tipams, of Oligocene to Miocene age (Acharyya et al., 1986a). Of interest to this report are a band of crystalline limestones near **Salomi** (3 caves documented by the expedition) and the limestones of the **Nimi formation** (30 caves).
Salomi

At Salomi on Kamku hill, a crystalline limestone band is exposed for about 3 km in length with 50m width. The subvertical band is about 100 m wide in the Salomi ridges and shows intense silicification, as noticed in the Salomi cave. According to Ghosh and Goswami (1986), these limestones occur at the contact of volcanics and metamorphics (phyllite - schist- quartzite).

Nimi formation

The limestones are associated with quartzite, quartz-sericite schist, phyllite and feldspathic quartzite bands and form a prominent scarp from Mimi towards the Psukhatsu ridge. The limestone bands are affected by longitudinal and transverse faults. There are seven limestone bands NW of the Nimi anticline whereas towards SE, 4 bands have been located. The limestones are whitish/ light grey to dark grey in colour and are generally fine grained. As also noticed by others, they are metamorphosed in various degrees, from possibly non-crystalline (Acharyya et al., 1986b) to schistose limestones and marble (Vidyadharan et al. 1986; Ghose et al., 2010). They are generally low-grade regionally metamorphosed rocks, but there is an eastward increase in the grade of metamorphism towards the east from the Naga Hills region (Ghose et al., 2014). Their thickness was estimated at 140 to 200 m (Agrawal and Ghose 1986), but they are affected by tight isoclinal folding with steep axial planes dipping 80–85 towards SSE and show slaty cleavage and stripping lineation (Vidyadharan et al. 1986). The outcrop thickness of limestone varies from 5m to about 100 m and the estimation of their precise thickness is difficult due to tightly folded nature of the rocks.



Longtok Khün1, Passage developed along an anticline fold. Photo by Tudor Tamas, 2022



Folds in a limestone boulder near Wüezietsü Khong 1. Photo by Tudor Tamas, 2023

References and Acknowledgements: see APPENDIX

SPELEOGENESIS

General Setting of the caves in the Mimi Area

Thomas Arbenz, Swiss Institute for Speleology and Karst Studies SSKA

The majority of the caves surveyed in the Mimi area are situated at an altitude of around 1200 to 1400 m asl, where traces of palaeo - drainage systems and some relic sinkholes were found. Erosion destroyed parts of the relic caves, leaving isolated fragments of passages generally situated in, or defined by breakdown. The general lack of detrital filling may point to autogenic recharge in many of the caves. The caves contain abundant speleothems, some of which are relic, and others are active. At valley level, at around 700 to 800 m asl, some relic resurgence caves are situated. Their entrance parts are large portals, indicating prominent water flow and drainage, however their higher reaches are again defined by breakdown covered with abundant calcite deposits.

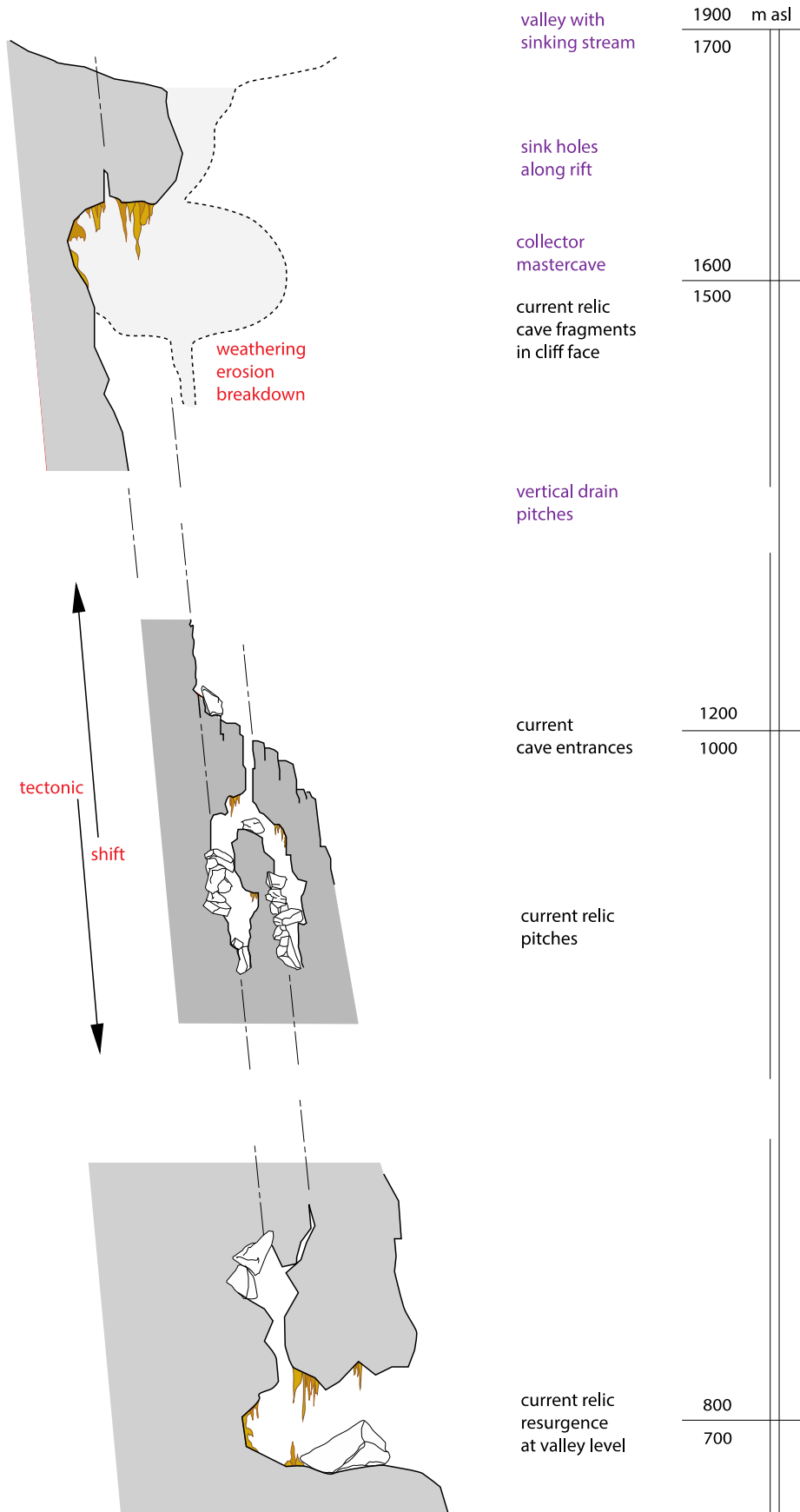


Entrance to Longdok Khün, the Coffin Cave

Photo by Tudor Tamas, 2023

As the dip of the limestone layers is generally between 70° and 80° the hopes of the expedition were high to discover vertical caves of 500 to 800m depth, however, despite digging in some promising places, the vertical progression always ended in impenetrable break down. The exploration of the 33 Mimi Caves therefore resulted in surveyed length between 5 m and 335 m and surveyed depth between 6 m and 115 m.

GENERAL SETTING OF CAVES IN MIMI AREA



BIOSPELEOLOGY

Cave biology in the Mimi & Salomi areas of Nagaland, India

Dan B. Harries Harriot-Watt University, Edinburgh, UK

Introduction

Although the caves of Nagaland have doubtless been known of and used by local inhabitants since antiquity, there are few systematic written accounts. Such accounts include archaeological investigations of caves (e.g. Jamir *et al.*, 2017) and studies relating to the bat fauna of the caves (Mani *et al.*, 2017). We are not aware of any existing written accounts of the invertebrate biota of the Nagaland caves. From neighbouring areas there are biological cave records from Meghalayan caves to the west and from Myanmar to the east. From Meghalaya, there are particularly detailed records from Siju cave in the Garo Hills (Andrewes, 1924; Annandale and Chopra, 1924; Blair, 1924; Brunetti, 1924; Cameron, 1924; Carpenter, 1924; Chopard, 1924; Chopra, 1924; Edwards, 1924; Fage, 1924; Fletcher, 1924; Fleutiaux, 1924; Gravely, 1924; Hora, 1924; Kemp, 1924a; Kemp, 1924b; Kemp and China, 1924; Kemp and Chopra, 1924; Lamb, 1924; Meyrick, 1924; Ochs, 1925; Patton, 1924; Roewer, 1924; Rohwer, 1924; Silvestri, 1924; Stephenson, 1924; Wheeler, 1924, Harries *et al.*, 2020) but also from other cave areas (Harries *et al.*, 2008) and new species continued to be recognized (e.g. Dahanukar *et al.*, 2023). The cave biota of Myanmar has been subject to intermittent study since the 1880s (e.g., Fea 1888) and continues to yield new species descriptions (e.g., Kottelat and Grego 2020). Comprehensive reviews of the records of Myanmar cave biota are presented in Steiner 2010 and in Steiner 2013 and additional detailed biospeleological surveys are presented in Bréhier 2015 and in Rahmadi 2015. In December 2022 and January 2023, the areas surrounding Mimi and Salomi villages in the eastern part of Nagaland were visited by an international team of speleologists focused on the mapping and documentation of the caves. As part of this endeavour, biological observations were made in a number of caves. These are summarized here and placed into context by comparison with existing knowledge of cave biota in neighbouring regions.

Methods

Biological assessments of the caves were made on an opportunistic basis. Caves were selected for investigation based on reports from the cave mapping teams or based on the most promising prospects described by the local guides. Within each cave an overview assessment was made of the physical environment and of the most prominent components of the biota. Localized areas of the cave were selected for more detailed investigations and the location of these areas established by reference to the data points of the cave mapping survey.

The survey areas were selected to be remote from the entrance, representative of the cave and also to be representative of different environments within the cave (where possible). Within each area, a detailed search was made for biota and a photographic record made using Nikon D7100 DSLR with a 105 mm macro lens and ring flash. Details of the environmental characteristics of the area were noted and abundances of the different taxa were estimated. Records were made in-situ using a voice recorder which was subsequently transcribed on the surface.

Results

A total of 9 caves were subject to a biological survey. Summary details of the caves are provided in the table below.

Cave	Survey date	Entrance coordinates	Overview description of cave
Kijingvong Long Khun (Salomi Cave)	21/12/22 & 22/12/22	25°47'11.7" N 94°53'35.2" E	Entrance series of steeply sloping dry walking size passages leads to a constriction at a pitch head. A short pitch drops into a chamber with a dense active bat colony. An opening part way down the pitch leads to a steeply sloping dry chamber with a floor of degraded guano. Further pitches lead off from the base of this chamber.
Raneak Khun	24/12/22	25°43'16.6" N 94°54'20.6" E	A large and well illuminated entrance chamber has a passage leading off to the right at the rear. This passage begins with a short drop leading into a middle chamber. At the back of the middle chamber there is a constriction and short drop giving access to the inner chamber.
Whourr Clan Cave	26/12/22	25°42'59.3" N 94°54'32.0" E	A well illuminated entrance area contains numerous pots containing human bones and skulls. At the back of the entrance area a slightly narrower section trends upwards over damp soil. This leads into a boulder chamber opening out into a rift with a short pitch to its floor.
Deprak Long Khun	28/12/22	25°43'11.9" N 94°54'21.6" E	Cave predominantly vertical and dry in the upper series. At the base of the third pitch there is a large chamber with a floor of degraded guano and a large active bat roost present nearby.
Zholap Khun 1	29/12/22	25°43'34.1" N 94°54'57.0" E	Cave of generally horizontal dry passages.
Zholap Khun 2	30/12/22	25°43'05.0" N 94°54'05.5" E	An entrance pitch drops to a chamber with loose boulder floor sloping down to a short climb into the top of a large sloping chamber. At the base of this chamber the ceiling becomes low and the passage leads off to the right. Passage continues beyond this point and trends upwards into another chamber with small passages leading off.
Longtok Khun 1	31/12/22	25°41'21.6" N 94°54'00.7" E	A short horizontal cave. Very dry and well illuminated throughout.
Longkhiak Khun	3/1/23	25°43'03.1" N 94°54'21.6" E	The cave consists of a short series of pitches down a rift. Very dry throughout. Forest soil on present on ledges (fallen down from entrance).
Nakatsu Khun 1	4/1/23	25°42'40.2" N 94°54'07.6" E	Horizontal entrance. Old fossil passage. Extends only about 20 meters. Fairly dry but some moisture on the floor soil. The floor soil appears to be soil washed in from the forest.

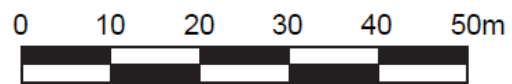
Overview of biological records

Kijingvong Long Khun (Salomi Cave)

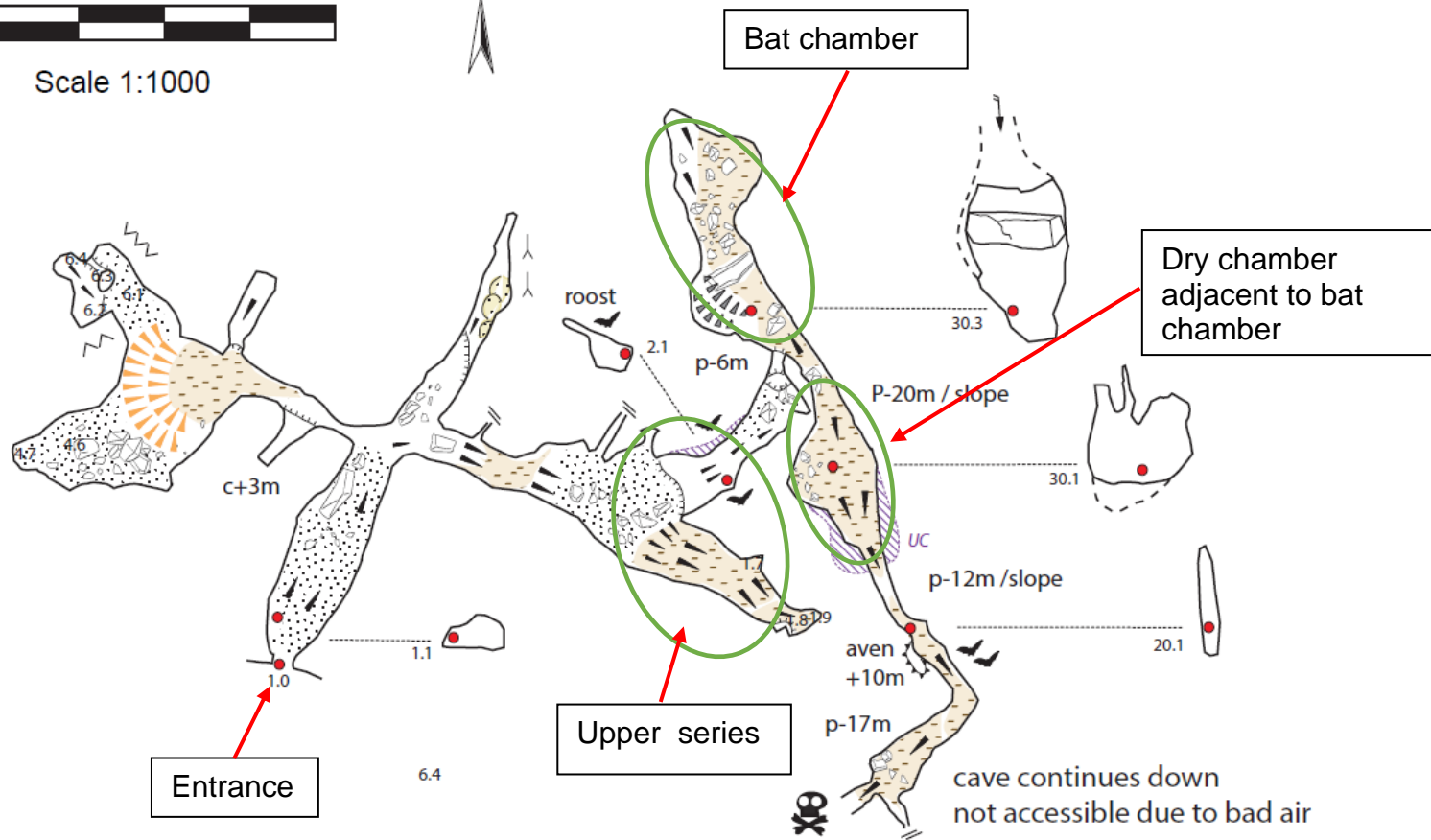
Entrance series of steeply sloping dry walking size passages leads to a constriction at a pitch head. A short pitch drops into a chamber with a dense active bat colony. An opening part way down the pitch leads to a steeply sloping dry chamber with a floor of degraded guano. Further pitches lead off from the base of this chamber. Three locations were assessed as shown in the table below.

Area	Location within cave	Physical notes	Biological notes
Upper series	Immediately above the pitch head.	Passage immediately above the pitch head with dry sandy floor, evidence of human activity including burnt material and a small amount of vegetation debris. Formerly, bats were harvested here. Area also includes a side passage which consisted of a steep muddy slope extending down on the right shortly before the pitch head. It extended for about 20 m and closed down at the base.	In passage immediately above the pitchhead a small number of spiders (Pholcidae?) with stripey abdomen. One small millipede (juv. <i>Trachyjulus</i> sp?) and also some dead remains of larger millipedes. Side passage with Brown crickets (inc. females and nymphs). Spiders, including a small jumping spider and the Pholcidae? spiders (sparse). Single nymph of white cockroach. A few small <i>Trachyjulus</i> sp? millipedes clustered around a single drip pocket. Elsewhere all very dry and fauna very sparse.
Bat chamber	Chamber directly below pitch.	Cave floor of damp loamy bat guano overlying large boulders.	Abundant (many hundreds) of bats on ceiling. <i>Trachyjulus</i> sp? millipedes very abundant (tens of individuals per m ² overall, reaching hundreds per m ² in many areas). Yellow isopods, brown crickets & Pholcidae? spiders present.
Dry chamber adjacent to bat chamber	Chamber on right near bat chamber.	Steeply sloping floor of dry guano.	Several Brown crickets seen. Sparse Pholcidae? spiders and <i>Trachyjulus</i> sp? millipedes. Single white cave cockroach seen. Nematoceran fly present. Overall abundances relatively low.

Kijingvong Long Khun (Salomi Cave) – plan view



Scale 1:1000

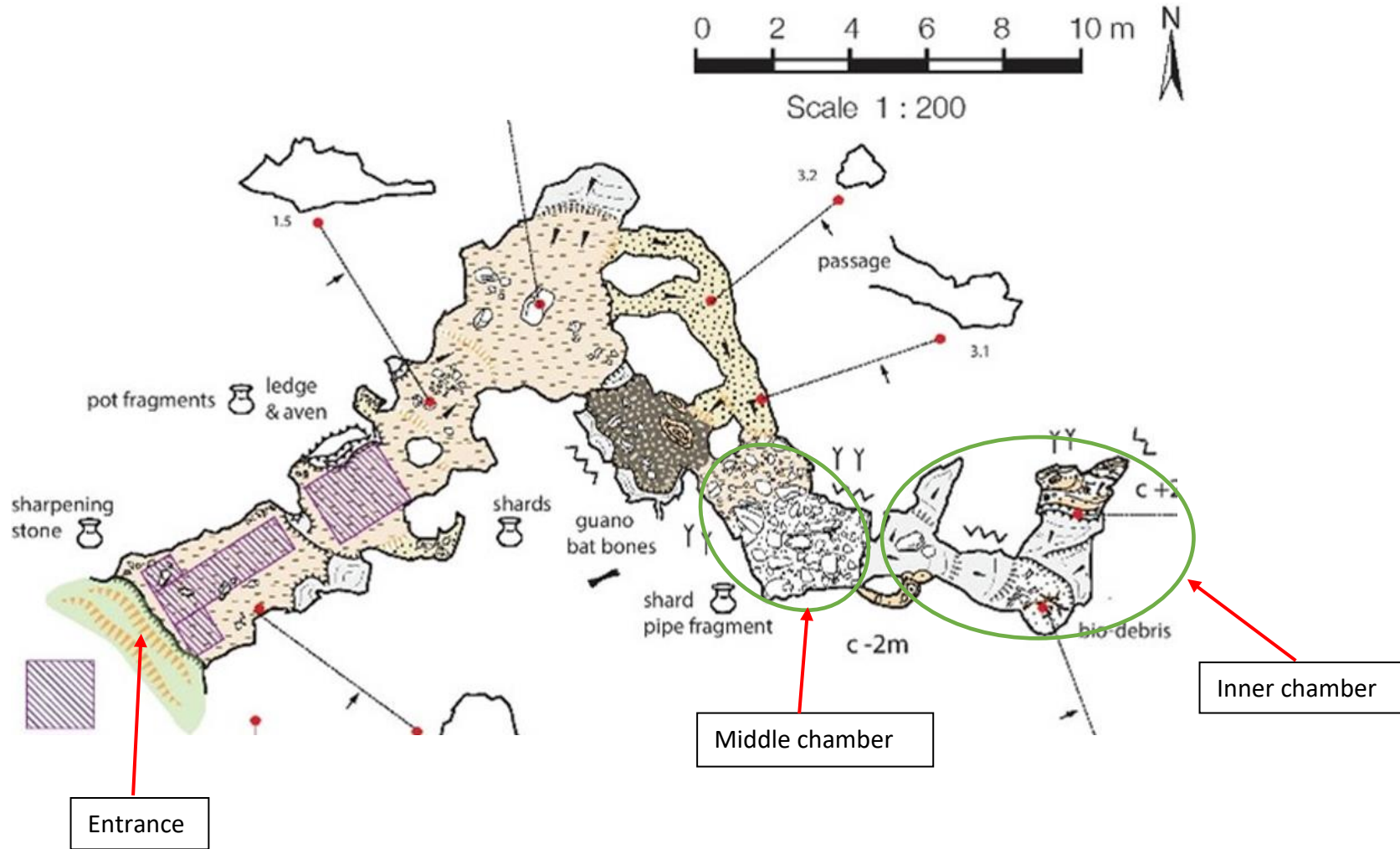


Raneak Khun

A large and well illuminated entrance chamber has a passage leading off to the right at the rear. This passage begins with a short drop leading into a middle chamber. At the back of the middle chamber there is a constriction and short drop giving access to the inner chamber. No evidence of a current bat roost. Bats were seen in the inner & middle chambers but only a couple of individuals. Occasional scattered bat bones were present at some locations. Also, there was evidence of bat harvesting with a discarded net present near the constriction leading into the inner chamber. Two locations were assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
Middle chamber	See survey below	Distinctly cooler and dryer than the inner chamber. Some drip pockets on the floor.	Isopods and brown crickets were fairly numerous. White cockroaches are present but considerably sparser than the inner chamber. Large <i>Erebus</i> moth seen on ceiling. Biota generally sparser than the inner chamber.
Inner chamber	See survey below	Distinctly warmer than outer part of cave. The floor is composed of a soil of old degraded bat guano with occasional angular cobbles and bits of forest debris. The guano floor is moist due to drips falling from the ceiling.	Isopods were abundant (pale and darker individuals present). Brown cave crickets also abundant. White Cockroaches are quite common. Orb web spider & collembolans present. Fungus gnat larvae webs present in constriction that leads to the inner chamber.

Raneak Khun - plan view

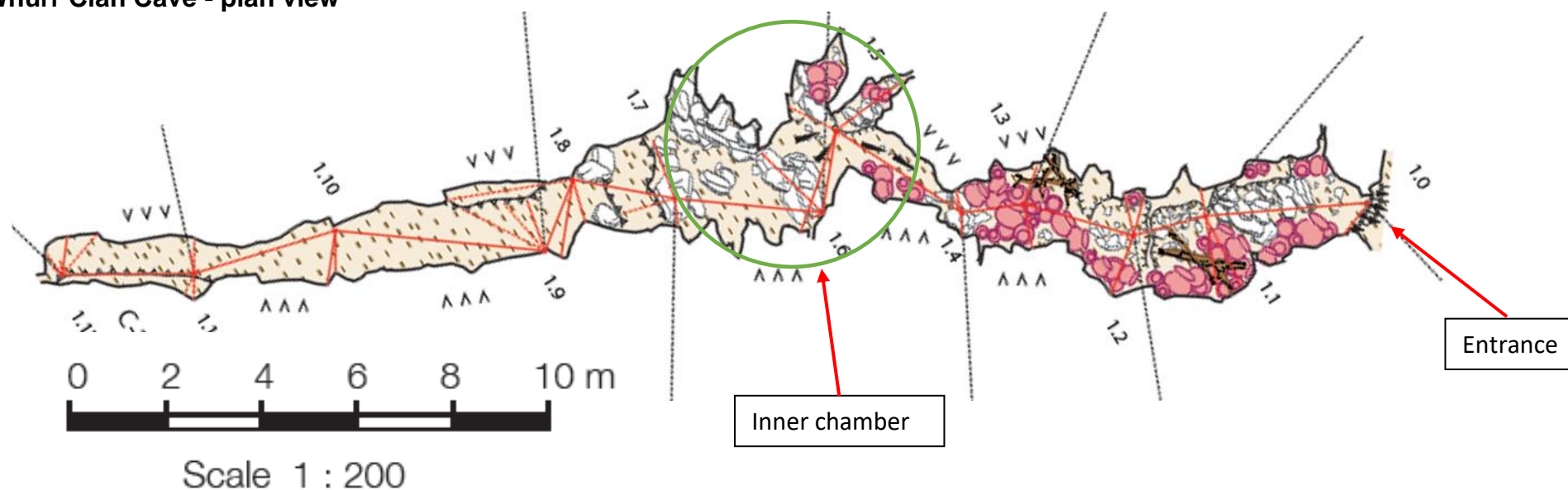


Whurr Clan Cave

A well illuminated entrance area contains numerous pots containing human bones and skulls. At the back of the entrance area a slightly narrower section trends upwards over damp soil. This leads into a boulder chamber opening out into a rift with a short pitch to its floor. A single location was assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
Inner chamber	See survey below	Distinctly warmer than outer part of cave. Dry boulders & ceramic pots.	Biota generally very sparse. A few brown crickets present. <i>Heteropoda</i> spider, isopod, a pair of mating moths, a beetle and a fly also present as single individuals.

Whurr Clan Cave - plan view

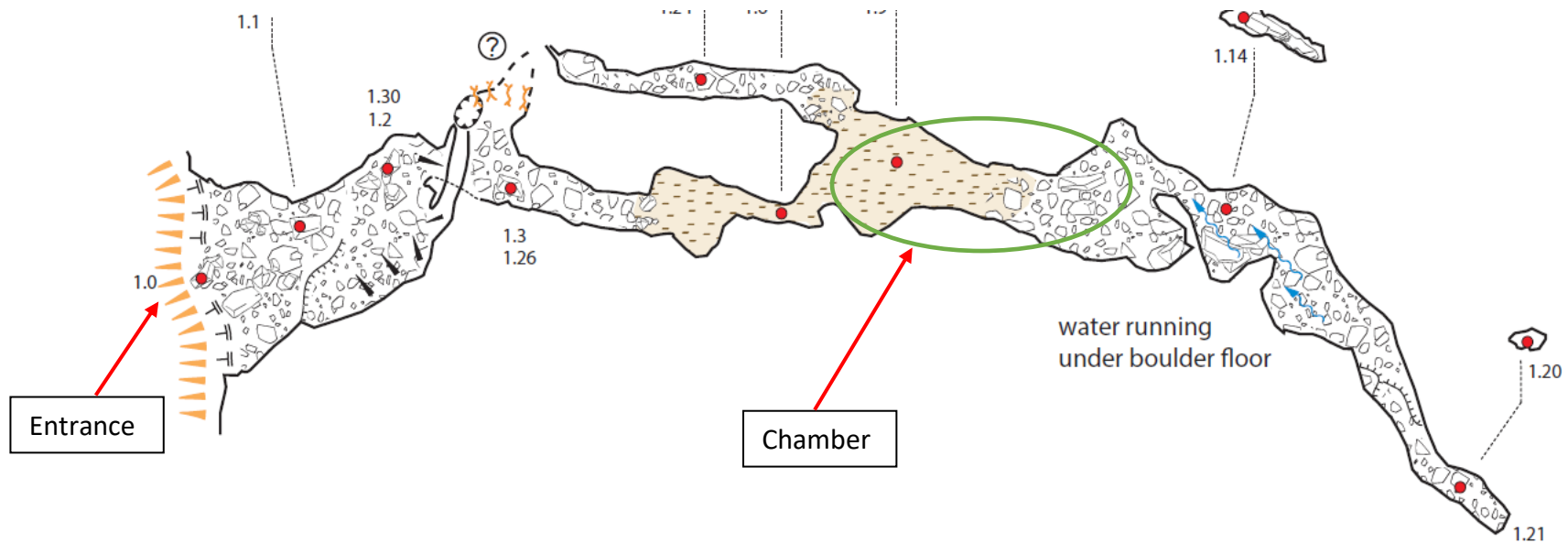


Zholap Khun 1

Cave of generally horizontal dry passages. Biological survey was conducted in a chamber just beyond a short crawl in the vicinity of survey station 1/11. A single location was assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
Chamber	survey station 1/11	Distinctly warm temperature. Generally horizontal floor of gravel and degraded guano. Mostly dry but some moist rock surfaces.	Biota generally sparse. <i>Trachyjulus</i> sp? millipedes common. Isopods frequent. Brown crickets present. Several <i>Allopeas</i> snails seen. Collembolans present. Single white cockroach seen. Rats present. Single ant seen.

Zholap Khun 1 - plan view

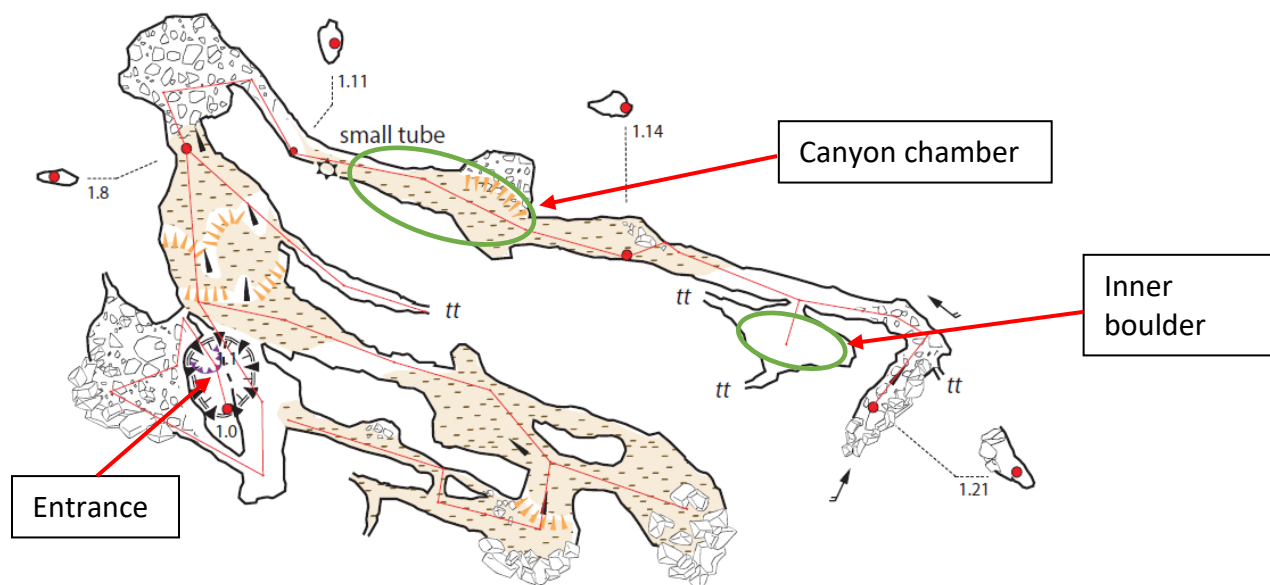


Zholap Khun 2

An entrance pitch drops to a chamber with loose boulder floor sloping down to a short climb into the top of a large sloping chamber. At the base of this chamber the ceiling becomes low and the passage leads off to the right. Passage continues beyond this point and trends upwards into another chamber with small passages leading off. Bear skull found near base of entrance pitch. Appeared to be of considerable age based on the dry & powdery texture of the bone. Live porcupine (size of a small badger) seen within a series of dry passages near the base of the entrance pitch. Two locations were assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
Canyon chamber	near station 1.12	Very dry fossil passage with a floor of cobbles in outer part and floor of degraded guano in the inner part.	Bats present but very small numbers. Only single individuals seen. Three live rats seen. Nests present, piles of rat droppings and scratch marks on rocky walls of the passage. A few brown crickets noted (no isopods or millipedes). Numerous moths. Also present were web building spider, beetle, fly & reduviid bug. Biota generally sparse.
Inner boulder chamber	near station 1.19	Generally rocky passage.	Porcupine droppings and quills present. Brown crickets, <i>Heteropoda</i> and moths present.

Zholap Khun 2 - plan view

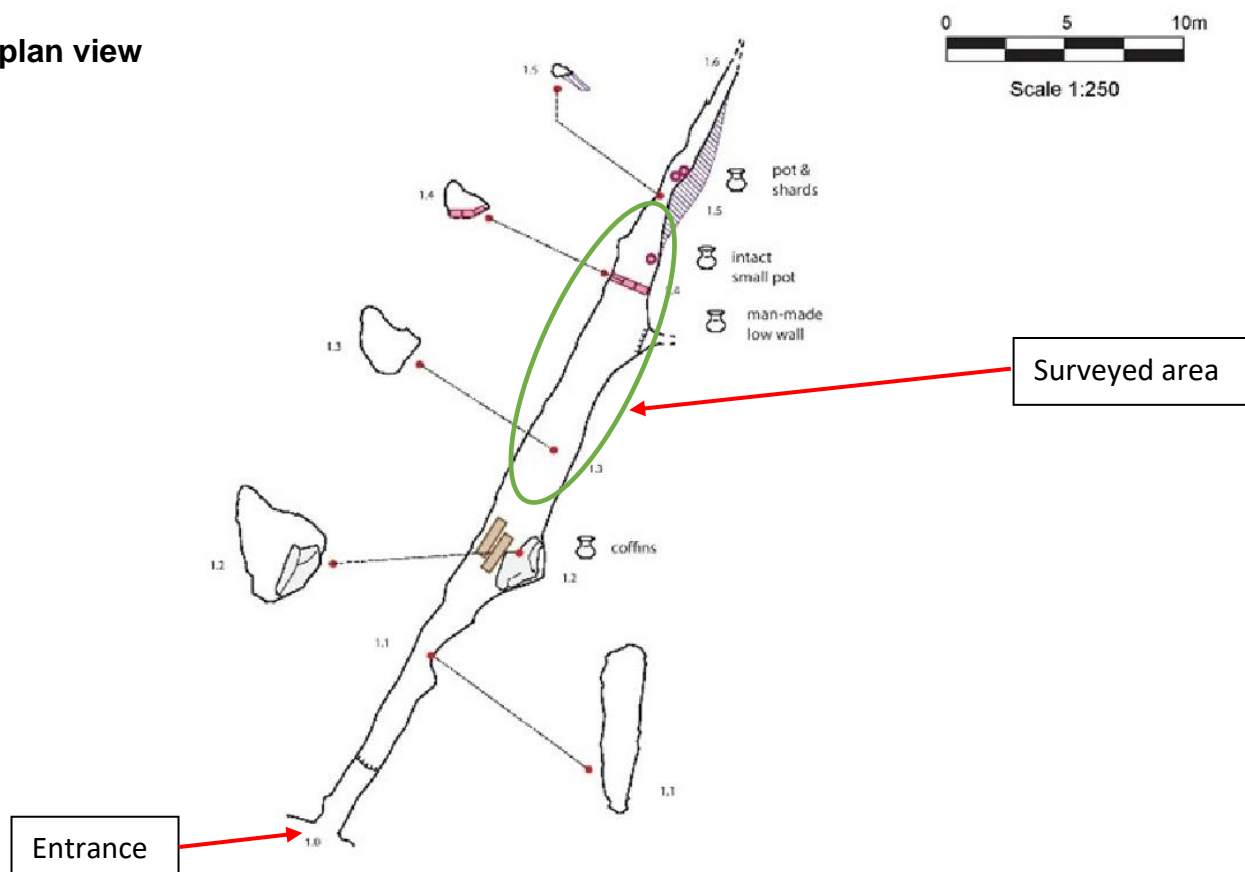


Longtok Khun 1

A short horizontal cave. Very dry and well illuminated throughout. A single location was assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
All area	Mainly inner part	Very dry rocky passage.	Biota sparse. A few Brown crickets. <i>Heteropoda</i> present. A green cricket in a small ceiling alcove. Large <i>Erebus</i> moth close to the entrance.

Longtok Khun 1 - plan view

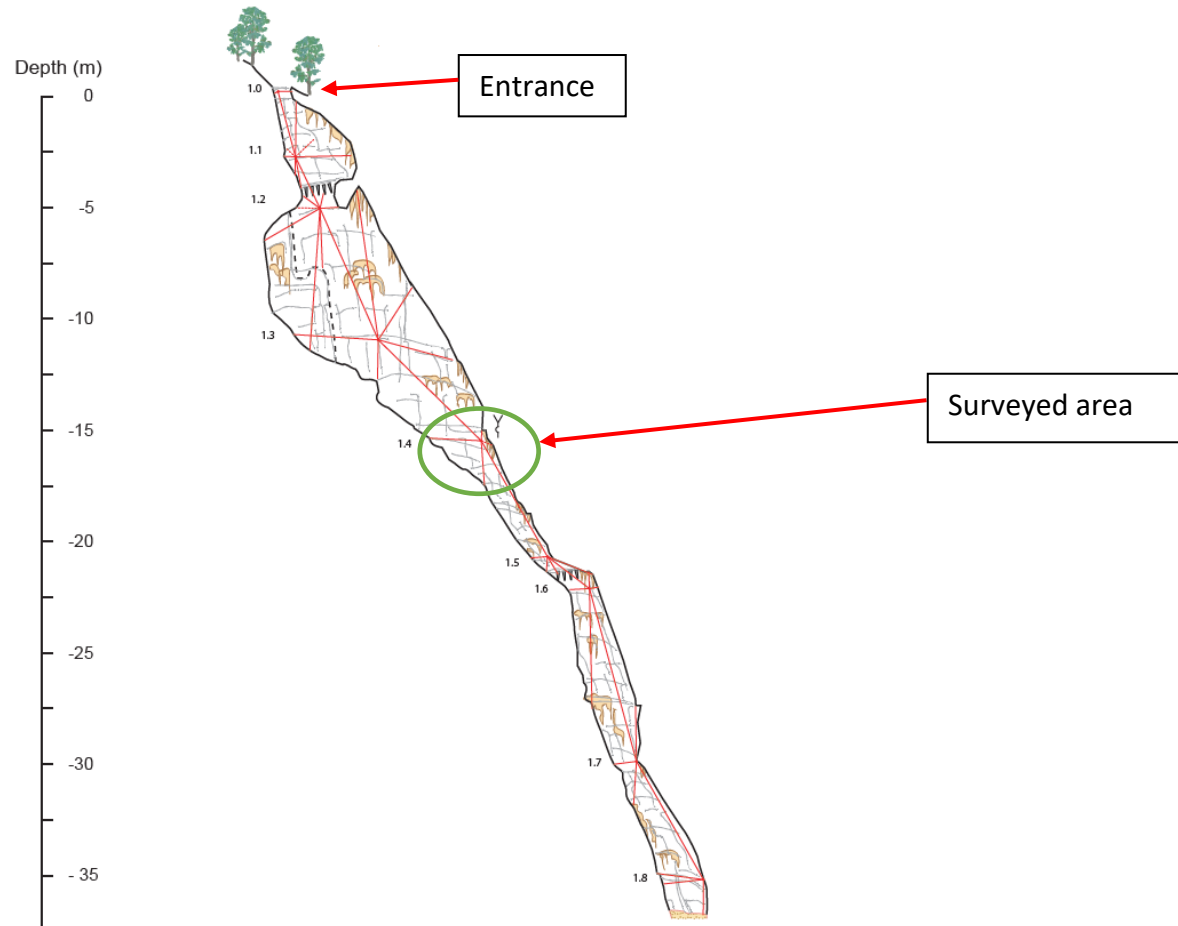


Longkhiak Khun

The cave consists of a short series of pitches down a rift. Very dry throughout. Forest soil on present on ledges (fallen down from entrance). Majority of records were taken from the base of the second pitch. Beyond this point, a live rat was seen, plus two rat's nests and at the base of the cave a dead rat was found surrounded by brown crickets and an isopod. A single location was assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
Ledge	Base of the 2 nd pitch.	Very dry. Forest soil on present on ledge.	Very sparse biota. Sparse brown crickets, a few spiders (including Pholcidae?) and an Opiliones at base of second pitch. A surface cricket also seen.

Longkhiak Khun – side elevation

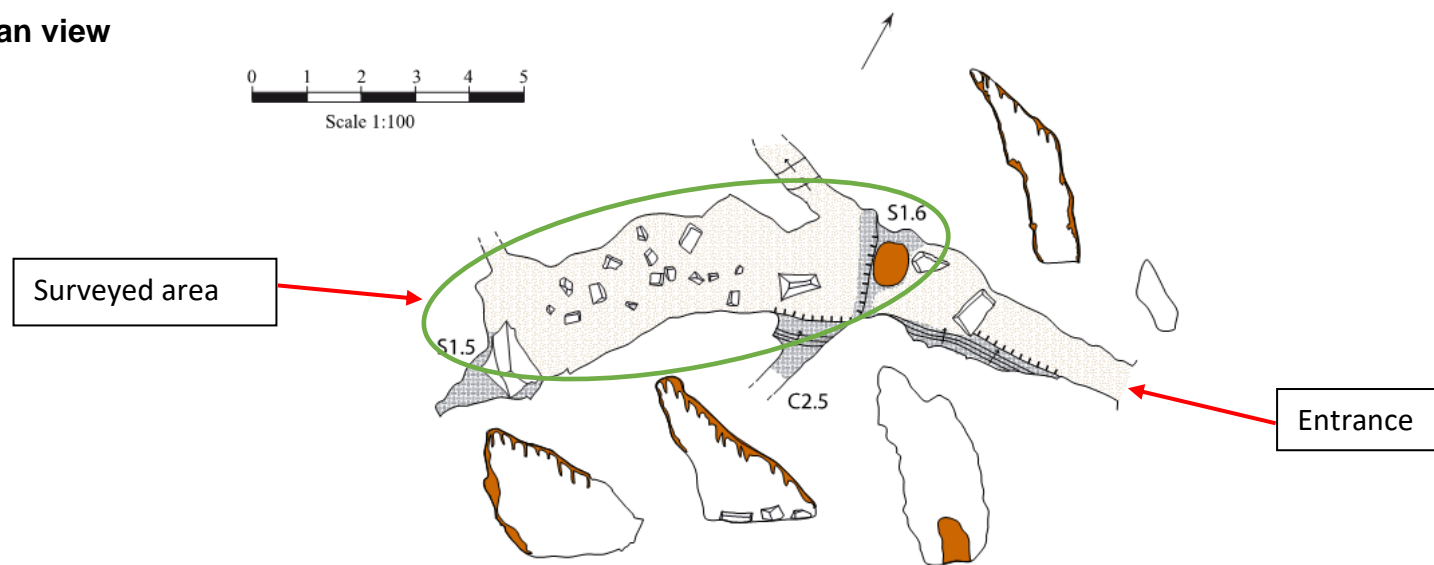


Nakatsu Khun 1

Horizontal entrance. Old fossil passage. Extends only about 20 meters. Fairly dry but some moisture on the floor soil. The floor soil appears to be soil washed in from the forest. A single location was assessed as shown below.

Area	Location within cave	Physical notes	Biological notes
All area	Mainly inner part	Fairly dry but some moisture on the floor soil. The floor soil appears to be soil washed in from the forest.	Large aggregations of black opiliones found just within the entrance. Apart from that, the biota is very sparse. A few brown crickets. Flies & spiders (including Pholcidae?) present.

Nakatsu Khun 1 - plan view



Overview of notable taxa recorded

Millipedes (*Trachyjulus* sp.?)

Millipedes which appeared similar to *Trachyjulus* were noted in three of the nine caves. Two of these sites were associated with active bat colonies. All three of the sites had some moisture noted in contrast to other sites which were much drier and lacked these millipedes. They were particularly abundant in the bat chamber of Salomi cave and were photographed feeding directly on fresh bat guano.

The identity of these millipedes remains to be verified. They appear very similar to the *Trachyjulus mimus* millipedes recorded in Siju cave (Harries *et al.*, 2020) and also to similar millipedes recorded in other Meghalayan caves (Harries *et al.*, 2008). Millipedes attributed to this genus have also been reported from Myanmar caves (Steiner 2010).



Trachyjulus sp? Salomi cave, Nagaland 2023.



Trachyjulus mimus. Siju Cave, Meghalaya 2019.

Isopods

Noted in four of the nine caves. Two of these sites were associated with active bat colonies. In some cases they were present in considerable numbers and appeared to be absent from the drier sites.

The isopods appear very similar to *Porcellio assamensis* recorded in Siju cave (Harries *et al.*, 2020). They were very clearly distinct from the *Cubaris* & *Philoscia* isopods that predominate in most Meghalayan caves (Harries *et al.*, 2008).



Isopod. Raneak Khun, Nagaland 2023.



Porcellio assamensis. Siju Cave, Meghalaya 2019.

Brown crickets

Noted in all nine of the caves inspected. Not in great abundance in any site but always relatively easy to locate. Present in dry as well as moist locations but perhaps more common at more moist and organically enriched sites. These crickets appear very similar to crickets that are ubiquitous in the caves of the Jaintia Hills in Meghalaya which were tentatively ascribed to *Eutachycines brevifrons* (Harries *et al.*, 2008). Crickets attributed to this genus have also been reported from Myanmar caves (Steiner 2010).



Brown cricket. Longtok Khun 1, Nagaland 2023.



Cf. *Eutachycines brevifrons*. Krem Um Ladaw, Meghalaya 2019.

White cockroaches

Noted in four of the nine caves.

Generally in low abundance. Tended to be absent from drier sites but also absent from the wet guano enriched bat chamber of Salomi cave.

These troglotic cockroaches appear very similar to those recorded from Siju and other caves in Meghalaya (Harries *et al.*, 2008 & 2020). However, much closer scrutiny will be required to establish if they are in fact the same species or merely similar in appearance.



White cockroach. Salomi cave, Nagaland 2023.



cf. *Typhloblatta caeca*. Siju Cave, Meghalaya 2019.

***Heteropoda* spiders**

Noted in three of the nine caves. Generally in low abundance. Very similar to the *Heteropoda* spiders seen in Meghalayan caves (Harries *et al.*, 2008 & 2020). However, they occurred less frequently than is typical for Meghalaya. In general appearance they are more similar to the *Heteropoda robusta* of eastern Meghalaya than to the *Heteropoda fischerii* of eastern Meghalaya. Spiders of this genus are reported from caves in Myanmar (Steiner 2010) and elsewhere in south east Asia.



Heteropoda sp. Zholap Khun 2, Nagaland 2023.



Heteropoda robusta. Siju Cave, Meghalaya 2019.

Pholcid spiders

Noted in three of the nine caves. Generally in low abundance.

Pholcids (cellar spiders) are frequent inhabitants of caves and cave-like environments worldwide. They are frequently recorded in Meghalayan caves (Harries *et al.*, 2008). Those noted in Nagaland appear different from those seen in Meghalaya.



Pholcid spider. Salomi cave, Nagaland 2023.



Pholcid spider. Krem Um Ladaw, Meghalaya 2019.

Erebus macrops

Noted in two of the nine caves. Only seen as single individuals high on cave walls near the entrance. Notable perhaps only because they are remarkably large moths. But also, because they have been recorded resting in Meghalayan cave entrances in a very similar manner at several sites. *Erebus macrops* have also been recorded in similar environments in the Myanmar caves (Steiner 2016).



Erebus macrops Longtok Khun 1, Nagaland 2023.



Erebus macrops Krem Lymbiat, Meghalaya 2014.

***Allopeas* snails**

Noted in one of the nine caves. Many individuals present. Notable because these snails were abundant in Siju Cave in 1922 and the authors of that study regarded them as partially troglomorphic. They have been recorded infrequently in other Meghalayan caves (Harries *et al.*, 2020). Potentially comparable snails (genus *Opeas*) have been recorded in caves in Myanmar (Steiner 2010).



Allopeas cavernicola? Zholap Khun 1, Nagaland 2023.



Allopeas cavernicola. Siju Cave, Meghalaya 2019.

Mycetophilid / keroplastid larvae

Noted in one of the nine caves. Only a few individuals present.

Notable because these larvae occur frequently in Meghalayan caves and might be regarded as a characteristic component of the cave biota (Harries *et al.*, 2008). They are far less frequent in the Nagaland caves visited to date.



Keroplastid larva. Raneak Khun, Nagaland 2023.



Keroplastid larva. Krem Sait Shyrba, Meghalaya 2015.

Black Opiliones

Noted in one of the nine caves. Many individuals present. Notable because dense aggregations of black opiliones have also been noted in the entrances of a number of Meghalayan caves (Harries *et al.*, 2008). Very similar aggregations are also noted from Myanmar caves (Steiner 2013).



Black opiliones. Nakatsu Khun 1, Nagaland 2023.



Black opiliones. Krem Umthloo, Meghalaya 2005.

Rats (*Leopoldamys edwardsi*)

Noted in three of the nine caves. Nests, faeces and scratch marks evident in addition to sightings of live rats. These rats also appear to be regular inhabitants of caves in Meghalaya (Harries *et al.*, 2008). A similar point could be made about porcupines which occur occasionally in Meghalayan caves and are similarly present in the caves of Nagaland. Rats of this genus are also reported from caves in Myanmar and elsewhere in south east Asia (Steiner 2013).



Leopoldamys edwardsi. Zholap Khun 2, Nagaland 2023.



Leopoldamys edwardsi. Krem Khlaw Song, Meghalaya 2011.

Discussion

Overall, the biota of the Nagaland caves appears impoverished in comparison to that of the neighbouring Meghalaya. This is evident both in terms of the abundance and the diversity of the biota. This difference is almost certainly attributable to limited availability of water and nutrients within the Nagaland caves. In Meghalaya, most caves are active 'live' systems with standing or flowing water present. Evidence of seasonal floods is often apparent, with deposits of flood borne vegetation within the caves. The seasonal nutrient input from flooding is presumably a major factor explaining the relatively diverse and abundant cave biota.

In contrast, the Nagaland caves visited in 2023 were exclusively dry fossil systems. There was little or no moisture present and no evidence of recent water flow. Cave sediments were primarily composed of degraded guano. It is unlikely that any significant nutrient is carried into these caves by active water flow. Nutrient input is largely limited to the guano associated with bat roosts. In these areas the biota is considerably more abundant than in other areas of the caves. The guano areas are typically dominated by the *Trachyjulus* type millipedes but also often support large numbers of isopods.



Isopods. Deprak Long Khun, Nagaland 2023.



Millipedes. Salomi Cave, Nagaland 2023.

Certain components of the Nagaland cave biota showed distinct similarities to that of Meghalaya. These include the *Trachyjulus* millipedes which are ubiquitous in Meghalayan caves. Similarly, they are present in any suitably moist and nutrient rich areas within the Nagaland caves. Another example are the brown crickets (*Eutachycines* sp.). These appear to be less restricted by the availability of moisture and are widespread in both the Meghalayan and Nagaland caves. Other components of the biota show clear differences. The characteristic and ubiquitous isopods in the Meghalayan caves are species of *Cubaris* and *Philoscia*. These were not encountered in Nagaland. Instead, the isopod fauna was dominated by *Porcellio assamensis* which

were abundant in areas of fresh guano. Within Meghalaya, this species has only been recorded from one cave (Siju Cave) where it occurred in a similar context on the guano deposits below an active bat roost.

The only definite troglobitic species encountered in the Nagaland caves were the highly cave-adapted cockroaches. Similar species are known from the caves of Meghalaya. The first record of these is the description of the troglobitic species *Typhloblatta caeca* from a cave in the Jaintia Hills (Chopard, 1921). Subsequently, similar troglobitic cockroaches have been recorded from many caves in the Jaintia Hills of eastern Meghalaya (Harries *et al.*, 2008) and also from Siju cave further to the west (Harries *et al.*, 2020). The limestone band that runs along the southern part of the Meghalayan plateau is discontinuous, so it is unlikely that there are subterranean connections between the populations in the Jaintia Hills and those of Siju cave. This is obviously also the case in regard to connections between the Meghalayan populations and those of Nagaland. So, it is probable that these populations are reproductively isolated and represent distinct but superficially similar species. In a broader context, Steiner (2010) notes records from caves within Myanmar of a cave adapted cockroach (*Spelaeoblatta gestroi*) of the same family (Nocticolidae) as those encountered in Meghalaya. Bréhier (2015) also provides records of troglobitic Nocticolidae from the Myanmar caves.

It is beyond the scope of this article to fully place the Nagaland cave biota in context with that of southeast Asia in general and such an account would be hampered by taxonomic uncertainty and limited coverage of biological recording in caves. However, it is clear that the Nagaland cave biota shows some broad similarities to cave biota in Meghalaya and also to that of Myanmar and other parts of southeast Asia.

In conclusion, it should be noted that the 2022/23 caving expedition only visited the immediate environment around the villages of Mimi and Salomi and that this represents a very small proportion of Nagaland. Caves may be present elsewhere in Nagaland and may be environmentally different from those visited in 2022/23. There is no reason to suppose that the cave biota described in this article is representative of Nagaland as a whole.

References and Acknowledgements: see APPENDIX

ARCHAEOLOGY

(Article submitted for publication with Cave and Karst Science, publication planned December, 2023)

Observations on Monoxyulous^(one-log) Coffin Caves and Secondary Burial Caves in Nagaland (India) and in South-East Asia

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Introduction

In the course of the North East India Caving Expedition 2022/23 (N.E.I.C.E 2022/23) the team of speleologists surveyed and documented 33 caves in the area of Mimi, Kiphire District of Nagaland in North East India. Some of the caves turned out to be of archaeological and cultural interest and the team was able to survey some of the caves studied by Naga Archaeologist Dr. Tiatoshy Jamir (see: references) and the several clan-owned caves, in particular the burial cave of the Whourr-Merr Clan.

As it happens was co-author Roman Hapka a member of the 2014, 2015 and 2016 Speleological expeditions to Myanmar. He got aware of the parallels and similarities in the cave related burial rites he had observed in Thailand and Myanmar. This ultimately led to the decision to share our observations, which can contribute to the ongoing research in the Mimi area.

Abstract

The observation of monoxyulous (one log) coffins in two caves along with several secondary cave burial sites in the Indian state of Nagaland, 1000km distant from those located in Myanmar and Thailand, is very remarkable and opens up new avenues of research. This is especially true since the tradition of burials in Naga Clan Caves have persisted until recently: Even though the Christian religion was introduced in the region in the 19th century, in many remote rural areas Christianity was only adopted in the 1950's and 1960's (Anderson, 2005, p237). Therefore, ethnology may be able to help answer archaeological questions. Furthermore, the finds in Nagaland are adding evidence to the possibility of Neolithic migration from South East Asia to North East India, an assumption supported by archaeological data interpreted by archaeologists like Peter Bellwood and Georg van Driem (Hazarika, 2006, p39-40)

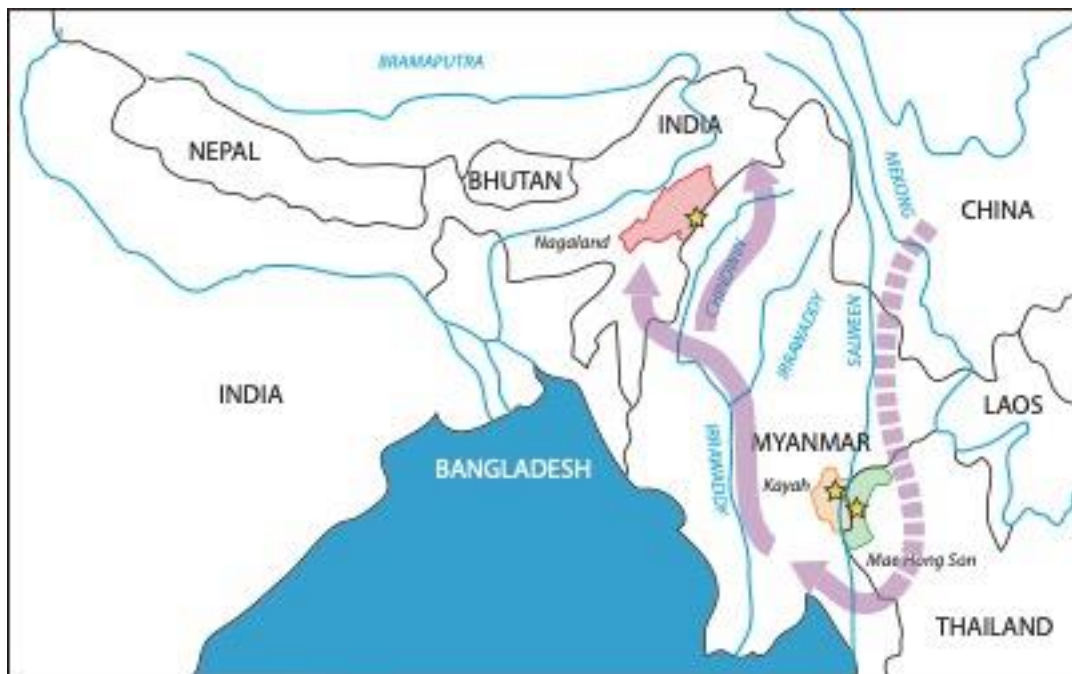


Fig 1 - Locations of the mentioned coffin cave areas in Thailand, Myanmar and Nagaland
 - Possible route of (Neolithic) Migration (Gogoi, 2020, p.1134)

Thailand and Myanmar

During speleological expeditions in Thailand and Myanmar between 2009 and 2017 it was possible to document several caves containing round log monoxyloous coffins (Dreybrodt et al, 2015, p12). Until recently this type of burial rite was not known further West than the state of Kayah on the Thailand/Myanmar border. It's in the north West of Thailand where the largest concentration of these burial caves is situated, and the most in-depth studies have been conducted, monoxyloous coffins, resembling those found in Thailand have been found throughout Southeast Asia, from southern China and Vietnam, Korea and Laos, western Thailand, Borneo and the Phillipines (Beavan et al, 2012, p3).

Mae Hong Son, North West Thailand

Round log monoxyloous coffins are present in numerous overhang rock shelters and cave entrances in northwest Thailand (Fig. 2,3,4) The largest concentration of these remarkable objects is located in Pang Ma Pha, near Mae Hong Son and close to the Myanmar border. To date, more than 80 sites have been recorded in this area (Sidisunthorn et al, 2006, p179-255) A smaller number of monoxyloous coffin sites have also been discovered in the districts of Pai, Chiang Dao and Mae Sariang (Sidisunthorn et al, 2006, p256ff).

Samples from eight coffins from Pang Ma Pha have been radiocarbon-dated between 2080 BP and 1240 BP (Sineeart et al, 2007, p48). Comparison and merging of results from more recent dendrochronological dating with the radiocarbon dating yielded dates between 1650 BP and 2040 Bp (Pumijumnonga, 2015). Most of the coffins were made from teak wood. The logs vary in size from one to nine meters in length and resemble hollowed-out log canoes, which they were mistaken for by early explorers. Each individual coffin consists of two parts, a base and a lid (Fig.4). Most of the Pang Ma Pha coffins are carved at both ends with distinctive patterns (Fig .3) More than 30 types of carvings have been documented and range from simple geometric motifs to animal heads (Sineeart et al, 2007, p49). There is no apparent relationship between the style and age of the coffins. In Pang Ma Pha, most of the coffins are neither buried nor placed on the ground, but are elevated on pillars and beams (Fig.2). Many of these support structures are extremely well made with mortise and tenon joints and beams notched to match the shape of the coffin base (Sineeart et al, 2007, p48)

The foundations for some of the columns were prepared by digging one-meter-deep holes and filling them with large stones. (Sidisunthorn et al, 2006, p108) Various funerary goods such as pottery, beads, and iron tools have been found in the coffins. In the Nam Lang Cliff cave, over 1,700 pottery fragments were recovered near a single coffin. (Sidisunthorn et al, 2006, p247) In some sites, these artifacts are still inside the coffins, but in most cases, they are scattered on the cave floor, and their association with the coffins is not certain.

Fragments of human bones and teeth have also been found with the artifacts, both inside the coffins and on the cave floor. In some cases, the remains of several different people have been found in the same coffin (Sidisunthorn et al, 2006, p104)

The monoxylous coffin sites in northwest Thailand have been studied by various Thai researchers, but there is still no general consensus on their interpretation. Although most scholars agree that the coffins were probably associated with funerary rites, doubt remains as to whether the caves were primary or secondary burial sites. In primary burial sites, the body is placed directly in the coffin, while in secondary burials, the bodies undergo a decomposition phase by being buried underground or by other means. Only after all flesh has decomposed are the bones transferred to the coffins, which then serve as large funerary urns.

The identity of the society which constructed the coffins remains a mystery. There is no direct evidence of their social structures, way of life or belief systems.



Fig 2 - Monoxyulous coffins in the caves of Mae Hong Son West Thailand

Photos by M.Björkman and R.Hapka, 1998



Fig 3



Fig 4

Kayah Northwest Myanmar

Monoxyulous coffins have been found in two caves in the Kayah state during the 2015 Myanmar Cave Documentation Project expedition (Dreybrodt et al. 2015, p10-22). Before the discoveries made in Kyet Cave and Coffin Ridge Cave (surveyed respectively in 2015 and 2016), no monoxyulous coffin cavities had been reported in Myanmar. These two coffin caves were thus the most westernly known, and their discovery expanded the known area of occurrence of this funerary practice.

Kyet Cave (Loikaw) - (after Dreybrodt et al, 2015, p12)

With 2.2 km of surveyed galleries, the Kyet Cave located near the Loikaw plain represents the third-longest cavity in Myanmar. It is made up of a well-developed upper gallery with numerous concretions. The lower part is occupied by a river that sometimes floods the entire gallery. The remains of at least 20 to 30 monoxyulous coffins have been found in the upper gallery, sometimes perched on ledges more than 10 meters high (Fig.5,6). Some coffins reach four to five meters in length, and the stylistic similarities with those of Thailand are striking.





*Fig.5,6 - Monoxyle coffins in the upper passage of Kyet Cave, Kayah/Myanmar.
Photos by C.Densham 2015*

Coffin Ridge Cave (Lo Bar Kho, Demoso) - (after Dreybrodt et al, 2015, p17)

Coffin Ridge Cave was reported to the expedition by the villagers. It is situated in a nearby hill at an altitude of 1450 m. Overlooking Kayah Valley it offers a great view of the area (Fig.7). Speleologically, it is a relic cave, the passages are dry and scattered with breakdown boulders and rocks. The surveyed length is 73m and the average dimensions are 10m wide by 8m high. Coffin Ridge Cave is a site of great archaeological interest: during the 2015/2016 expeditions of the *Myanmar Cave Documentation Project* the remains of three to five monoxylous coffins have been discovered in the entrance passage (Fig.8).



*Fig.7
Entrance of the Coffin
Ridge Cave,
overlooking Kayah
Valley, Myanmar*

*Photo by
Phil Bence 2016*



*Fig. 8
Monoxyle coffins in
Coffin Ridge Cave,
Kayah, Myanmar*

*Photo by
Marc Boureau 2016*

Mimi, Nagaland (Northeast India)

In 2009, Naga archaeologist, Tiatoshi Jamir, studied a few caves in the karstic zone near the village of Mimi and Hakkomute in the Kiphire district (Jamir et al. 2014, 2017; Jamir & Tetso Eds. 2020). Only one cave, Raneak Khün (also described as Cave 2 or Ranyak Khen), located at low altitude on the escarpment of a deep valley, revealed the presence of ancient artifacts. The excavated layers were dated between 6400 BP and 4500 BP (Jamir et al. 2014). Dating for this cave site is much earlier to the dated Neolithic sites of NE India. Evidence suggests the occupation of the cave by a small hunter-gatherer group (see Jamir et al. 2014, 2017, 2022; also see Taylor et al. 2020 for other cave and rock shelter sites). Other cave and rockshelter sites in the Mimi region date back to the Late Pleistocene, mid-Holocene and Late Holocene (Jamir & Tetso Eds. 2020; Taylor et al. 2020; Jamir 2022).

On our 2022/23 Expedition we were able to survey some of the caves studied by Dr. Jamir and the Whourr-Merr Clan cave. This insight along with the information gained from Interviews with the members of the Village Council, allowed us to make some additional observations, which can contribute to the ongoing research in the Mimi area.

During our survey excursion in December 2022, we found no evidence monoxylous coffins in Raneak Khun (Fig.9). However, in his 2009 Documentation, Jamir reports the find of an earth grave underneath a rock boulder, containing the remains of a young male adult. The sub-adult pit burial associated with an edge-ground stone tool and the pot containing human bones inside the same cave are two very different temporal contexts. While the pit burial is of a mid-Holocene age, the pot burial is very likely of a later historical period much after the Longfurr group moved into the region. (Jamir et al. 2014, p265ff).

This is a primary burial place and would correspond with the funerary rites of the Yimkhiungrü tribe of primary- and secondary burials (YTC, 2023), but why the grave was not emptied for the latter, or used as both, primary and secondary burial, remain unanswered questions – even more because we found a broken clay urn containing human bones on the site (N.E.I.C.E Expedition Diaray 2023)

Raneak Khün (Lapkhin Valley)

The cave is situated 1.2km North of Mimi Village, on the south-facing bank of Lap Khin (= Bat River), 50m above river level (Fig.10).

The 6m wide by 8m high opening, framed with tufa pendants, and a cut-marked Stalagmitic formation, is situated in a cliff face overlooking the valley (fig.11). Raneak Khun is 120m long and comprised of five chambers along a curved line into a rift, terminated by calcite blockage. The walls are covered with abundant pencil- and charcoal graffiti, indicating that the cave is frequently visited, it is Mimi's "Tourist Cave". Some pot and pipe fragments were

detected. Bat Bones and “live” guano indicate that the Guano Chamber is home to a bat roost (none present at time of visit). There was not much evidence of Dr. Jamir’s excavations but we found some artifacts hidden in a high alcove which might have escaped the archaeologists’ detection. However, when comparing their site map with the reality it became eminent that a thorough survey needed to be done. This was performed with digital cave survey tools, using a Disto X2 and PocketTopo software on a handheld computer (Heeb, 2009, p8-10).

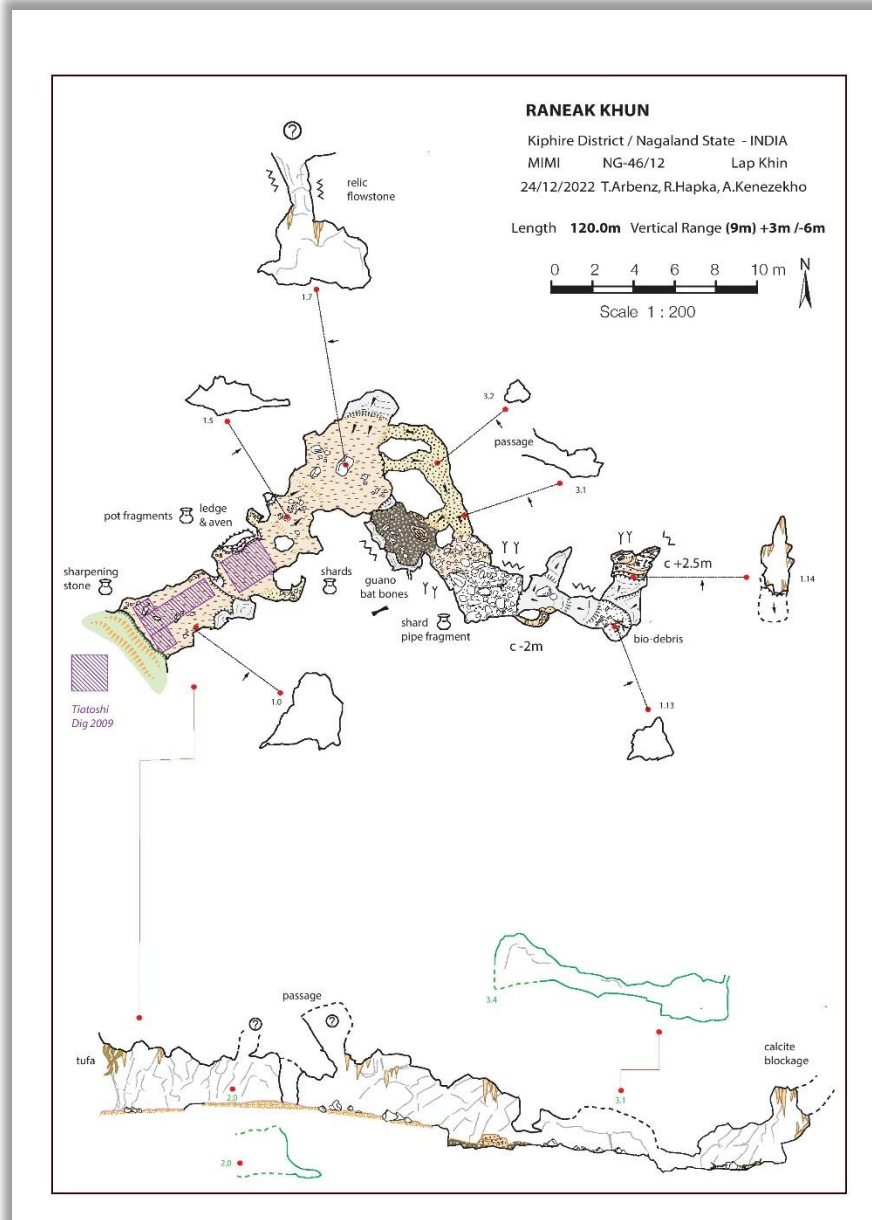


Fig.9
 Survey of Raneak
 Khün showing the
 position of the Jamir
 Dig 2009



*Fig.10 - Entrance of Raneak Khün, overlooking the densely overgrown Lapkhin Valley.
Photo by Roman Hapka 2022*



*Fig.11 - Horizontal cut-marks in tufa formation, still used as sharpening stone by the local hunters.
Photo by Roman Hapka 2022*

Monoxyulous Coffin Caves in the Mimi Area

The surprise came from two other caves located higher up on the Mimi Range: During our stay, the Chairman of Mimi Village Council showed us a short video sequence showing the extraction of a wooden coffin, evidently monoxyulous, from a cave. This intervention would again be the work of Tiatoshi Jamir in January 2021. It was part of a rescue archaeology that he undertook for the State Museum (Government of Nagaland) in Kohima (Jamir et al. 2022) – and this is obviously a major discovery: The first evidence of the extension of the tradition of round log monoxyulous coffin burials into India (Jamir et al. 2022). On our request, two guides took us to this cave called Longtok Khun - eventually the visit was arranged for 31st December 2022. However, guides who accompanied us that day first led us to a different cave (subsequently named Longtok 2) near (Jamir’s) Longtok Khun (Longtok 1), which we accessed later.

Longtok Khün 2 (Longtok 2)

This is an alcove cave situated at an altitude of 1400m asl, high up in a large rock pinnacle accessible only by climbing the exposed rock face. A bleached fragment of a human skull was found on a rock ledge near the base of the climb. The alcove contained a number of small coffin-like hollow logs, presumably containing bones. Due to the exposed location and the flaky, loose rock on the last 2 to 3 meters, the cave was only accessed by one member of the team and just briefly inspected.



*Fig. 12
The entrance of Longtok
Khün 2, situated in the
exposed face of a rock
pinnacle.*

*Photo by
Tudor Tamas, 2022*

Longtok Khün 1 (Longtok 1)

This is a straight rift passage situated at the base of another cliff near Longtok 2, at an altitude of 1390m asl (Fig. 13). In the cave we found three small round log monoxyulous coffins, about 100cm long by 25cm wide. The coffins were positioned on large rocks and were located 12m inside the cave (Fig. 14). At the back of the cave there were the remains of a small rock wall and beyond this a few pot shards, a broken clay pipe and a small intact pot were found (Fig. 15).



*Fig. 13
Entrance of Longtok Khün 1
Photo by Roman Hapka, 2022*



*Fig. 14
Monoxyulous coffins in Longtok Khün 1
Photo by Roman Hapka, 2022*

LONGTOK KHUN (1)

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Betang

31/12/2022 Richard Hudson

Length **37m** Vertical Range (7m) +0m /-7m

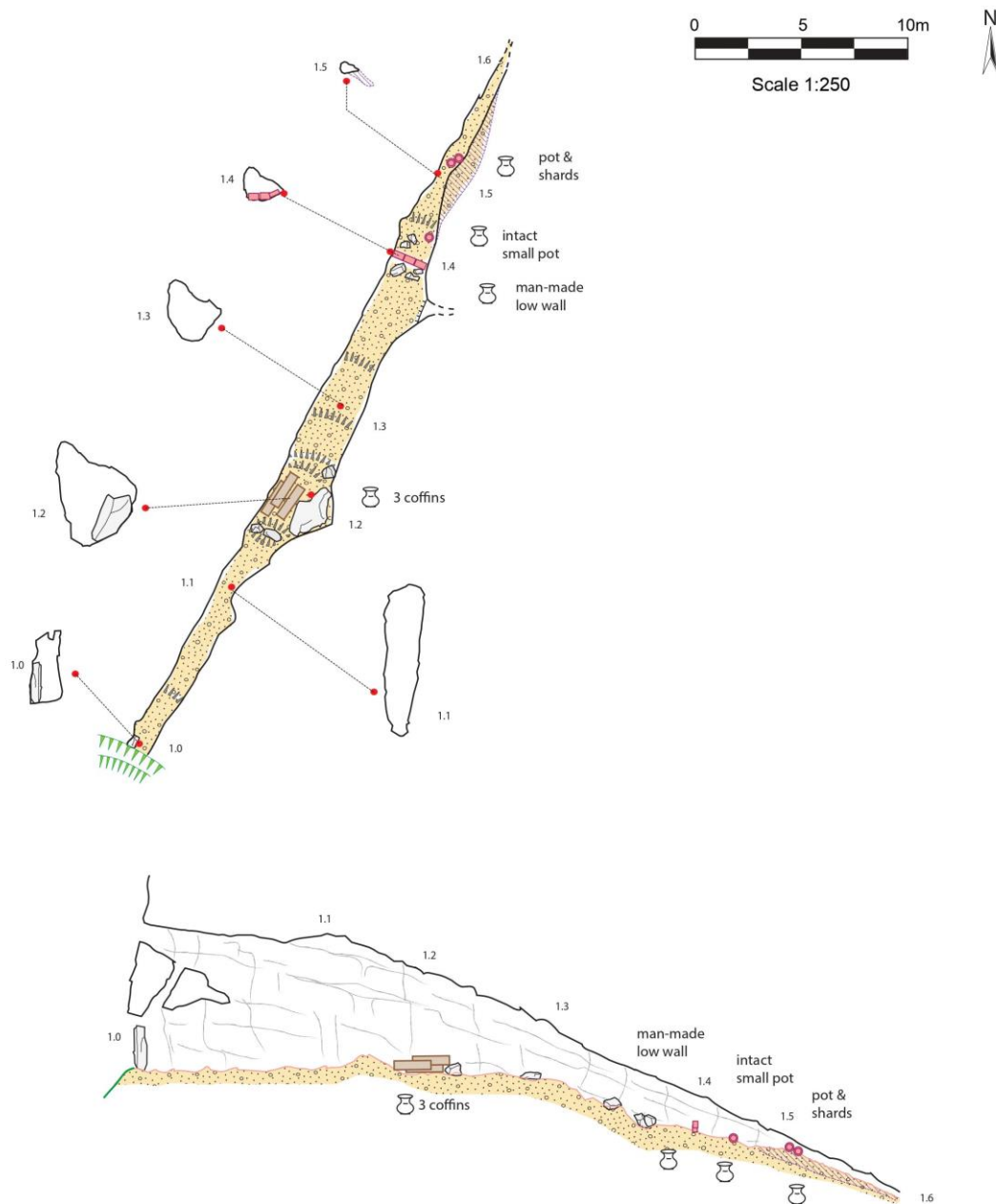


Fig.15
Survey map of Longtok Khün 1

Map by Rich Hudson, 2022

The Monoxyllous coffins we detected in Longtok 1 and 2 are significantly smaller and shorter than the ones known from Myanmar and Thailand. It seemed unlikely that a person (neither child nor adult) could have been buried in such a small container (Fig16). A probable explanation was provided during the extended interview with the village elders when it became evident that round log coffins and clay urns were used for the secondary burials where the remains of the dead are put to their permanent rest: The traditional secondary burial practice of Mimi was the exposure of the corpse in raised platforms close to the kitchen, thereafter, the final disposal of the bones in funerary pots Whether or not log coffins have been used for secondary burials can't be proved, as the coffins we found on-site were empty. However, parts of a human skull were found on the cliff outside the cave (N.E.I.C.E Expedition Video, 20023).

In more recent times the bodies were first buried in earth graves and left to decompose for one year. Then the remains were exhumed and the bones were placed in the small monoxyulous coffins or urns. They were then taken to the clan burial caves and left there to rest in the company of their ancestors (Achimpong et al. pers. comm. 2023).

- There appears to exist a discrepancy between the finds and conclusions of Jamir et al. and the narratives of VCC Achimpong and the Mimi Village Council. Where Jamir declares: “Except in funerary pots, the final disposal of bones in log coffins as an alternative practice was never the practice among the Longfurr group”, Achimpong et al. tell us in the interview, that secondary burials in monoxyulous coffins were an alternative practice (see: Discussion).



*Fig.16
Remains of three
monoxyulous coffins in
Longtok Khün 1*

*Photo by
Roman Hapka, 2022*

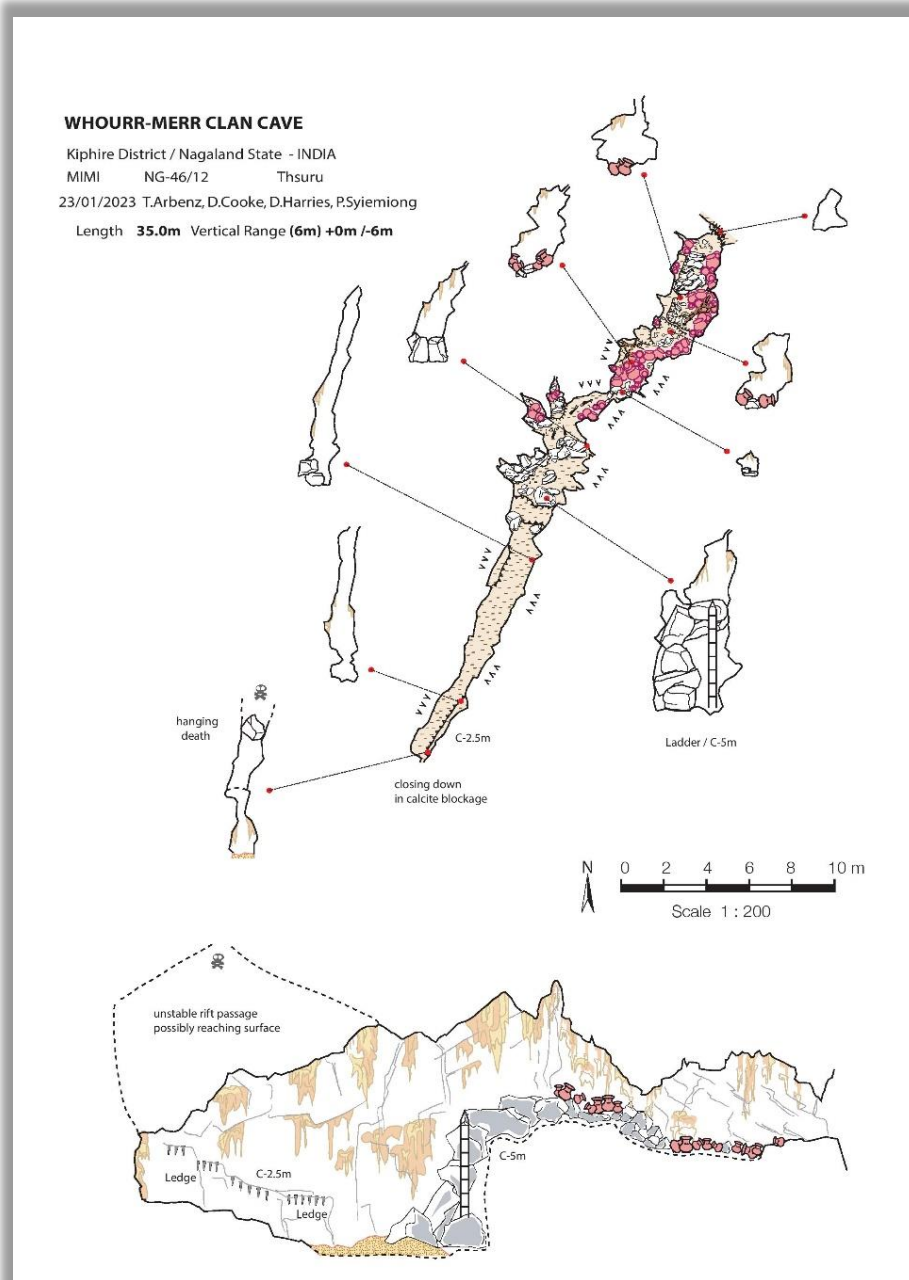
Clan Caves of the Yimkhungrü Tribe

The Yimkhiungrü tribe inhabits the Eastern part of Nagaland and is one of the major recognized tribes of Nagaland. The Nagas migrated from South-East Asia through the mountains and basins of China and Thailand to their present location through Burma along the Irrawady and Chindwin rivers (Fig.1) Crossing the Patakai Range, the Yimkhiungrü settled down in the Saramati Area (YTC, 2023).

In Mimi, the original name is Long Tsürong Khong, the Clans present are Whourr, Merr and Bomrr. The tribe was the first to commence war upon the Indian Army in 1955 and has a long history of freedom fighting for Naga Independence. As a consequence, the Yimkhiungrü were the last to give-up head hunting, which lasted till the early 1960's (YTC, 2023), (Achimpong et al, pers.comm. 2023).

During the late part of the 1950's Christianity was established in the Yimkhiungrü area by Missionaries from the Sumi and Ao tribes ((YTC, 2023) The religious communities are mainly Baptists (Anderson, 2005, p237)

Around Mimi, various caves serve as secondary burial sites for the three represented clans. Large ceramic funerary urns were used to collect the remains of the deceased, similar to the practice of monoxyulous coffins in Thailand and Myanmar. The only difference is that this tradition has been abandoned only relatively recently in Nagaland, during the campaign of the Christian Revival Movement 60 to 70 years ago (Anderson, 2005, p238).



*Fig.17
 Survey of the
 Whourr-Merr Clan
 cave with the
 positioning of the
 funerary urns*

*Map by
 Th.Arbenz, 2023*

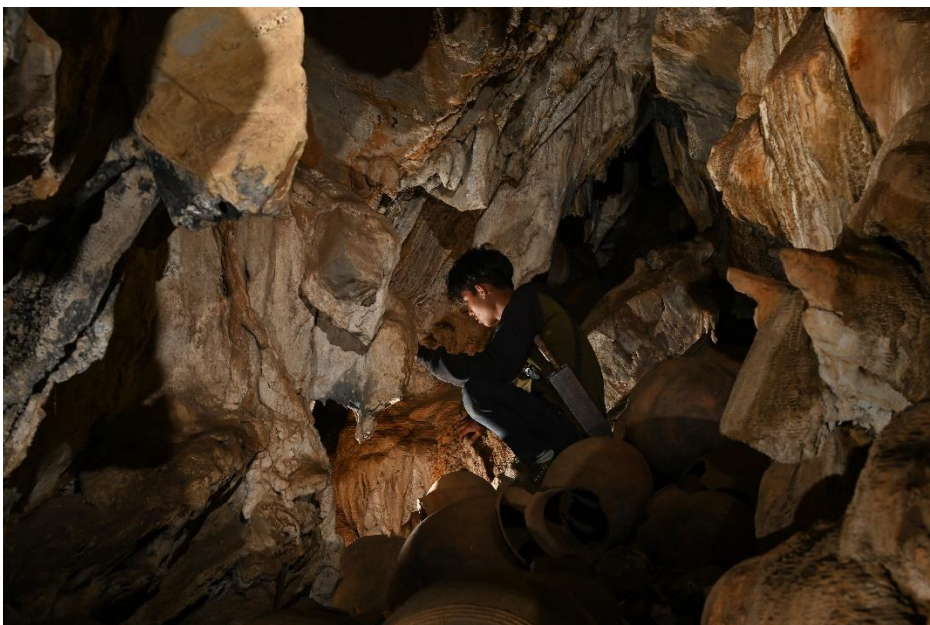
The first 25m of the cave are used to keep the remains of the ancestors of the clan (Fig18). They are deposited in urns (round pots with wide open neck and slate lid). Walls and roof are calcited (flowstone and stalactites). The floor is mainly breakdown filling a rift. After 12m a slope at a constriction leads to a second chamber. The general orientation of the cave is SW to SSW.

From the upper chamber there is a continuation: 10m high meander along a rift heading SW. This is reached by installing an electron ladder of 5m length. The meander can be followed for 10m where the 1m wide and 8m-high passage closes down in a calcite choke. The high reaches get close to the surface, but there is no way on and no outlet (Fig.17).



*Fig 18.
Secondary burial
urns. Whourr-Merr
Clan Cave*

*Photo by
Thomas Arbenz,
2023*



*Fig.19
Our guide Kiutsü
amidst the urns
containing the
bones of his
ancestors.*

*Photo by
Th.Arbenz, 2023*

Despite Christianity some of the animistic and pantheist rites and customs are living-on and clan members regularly visit their caves. For example, the practice of calling back the souls of the ancestors in times of need, illness or misfortune is still occasionally present (Achimpong et al. pers. comm. 2023) and respect for the souls in the caves is always due: when we were allowed to explore and survey the Whourr-Merr Clan Cave, our guide first greeted the ancestors and asked permission to enter the cave with us (Fig.19).

Conclusion

The persistence of a tradition of cave burials in the Mimi region until relatively recent times represents an unparalleled opportunity to attempt to understand this use of the subterranean world. Whether in ancient monoxylous coffins or more recently large urns, the method of burial is similar. Moreover, these customs still are present in the mind of the inhabitants of Mimi, who are well aware of the locations of the caves of each of the different clans. In-depth ethnological research could potentially provide a better understanding of what was happening 2000 years ago and over 1000km distant from the north-eastern border of India in the burial caves of Myanmar and Thailand. Nagaland offers the opportunity to get first-hand accounts of belief systems that underlie a practice that appears to have once been followed over much wider areas of South East Asia.

Discussion

- a) It is a fact that both, monoxylous coffins and clay urns, are present in different caves in the Mimi area. We found that it was either coffins or urns, but not both in the same cave. As far as we understand from the information given by VCC Achimpong the coffins belong to a much earlier period than the urns, which are more recent and used until the 1950's. The practice of secondary burials in monoxylous coffins as stated by VCC Achimpong et al. appears to be in contradiction with the finds and conclusions of researchers Jamir et al. An in-depth study and profound discussion between the two parties is needed to separate facts, orally passed-down narratives and speculations.
- b) The finds in the Mimi Coffin Caves don't prove the cultural connection to the finds in Myanmar and Thailand, but they clearly show a possible route of research, which will certainly answer some questions related to Neolithic migration in southeast Asia. Obviously, there are gaps in time and space that need filling. Comparison of carbon dating data of the Nagland coffins with the ones in Myanmar and Thailand would be a necessary first step. Archeological expeditions on the assumed route along the Irrawaddy and Chindwin valleys would have to follow to supply sufficient data proving the right or wrong of the south to north migration.
- c) As the practice of secondary burials in caves is still present in the memory of living people among the Yimkhiungrü tribe, Ethnologists should secure this knowledge by interviewing these people and document it.

References and Acknowledgements: see APPENDIX

CAVES OF SALOMI

On a recce tour in 2019 expedition Co-Leader Ayush Singh had visited the area on search for caves, and was shown Kijingvong Long Khün (aka Salomi Cave) the largest cave of Salomi. The cave length was an estimated 350 horizontal meters, and there was said to be a small opening leading to a vertical continuation and the sound of running water could be heard.

On the 2023 Expedition the local guides showed us two more caves, Nikib Betah Khun and Lupong Khun, the latter was said to be a possible top entrance for Kijingvong Long Khün.

The fact that the cave entrance was situated in a sheer cliff about 800 meters above Likimro Valley, together with the information about the sound of water and the possible top entrance, spurred much excitement among the expedition members: The cave seemed to have great potential to reach a vertical range of 1000 m.



Salomi Cave Entrance

Photo by Roman Hapka, 2023

EXPLORING SALOMI CAVE

[expedition diary] ... “After we've dealt with the exposed access down along the cliff overlooking Likimro Valley, the team split in two groups to go about their tasks. Done with the calibrating the instruments, the first group took to surveying and was able to do about half of the horizontal passages. Meanwhile the vertical team had brought 50 meters of rope, the drill and rigging gear to the promising hole down to the lower reaches of the cave.

A short approach slot to the pitch was quickly dealt with. At this point the passage entered the top of a 5 m wide and 1 2m deep chamber. Looking to the right the chamber wall is about 20m away roof is home to a large bat colony. At this point the bat colony was getting a bit twitchy and given that the rock was a bit poor and a natural hole for rigging was available it was decided to avoid drilling. A short drop of about 3 m, a bit of scrabbly climbing and the odd shout of warning as the rope twanged above and a belay point was gained. This allowed a view down into an equally large chamber with a generous swirling of bats. Unfortunately, the rope ran out half way down the chamber slope and it was decided stop for the day and return with a longer rope. Here the sound of water was heard ... or was it maybe the sound of wind or swirling bats?”



Exploring Salomi Cave

Photo by Roman Hapka, 2022

The next day saw again 2 teams in Salomi Cave while a third party investigated Lupong Khun, a shaft on the top of the exposed ridge, and surveyed the orifice as far down as blockage would let them. Although there was a detectable draught from below, the shaft ended after 12.5 m in a boulder choke with a vertical range of only -6 m.

In Salomi Cave, continuing at the 3-way junction after the entrance series, the horizontal team first surveyed the passage forking to the right. It was a steady slope down getting steeper to the end. Having done that, they headed back up continue with the passage leading to the pitch where the vertical team had already gone down. After completing this, the remaining horizontal side passages were dealt with.

[expedition diary] ... “Rich, Roman and Ayush, followed later by Biologist Dan Harries, went down the inclined guano-littered chamber to find a narrow continuation at the far end in a descending rift. Roman climbed the rift belayed by Rich to a point where it became necessary to rig. Rich rigged the rift and both descended to find another chamber and a further 20 m of descent – the rift passage was getting steeper and beyond an open shaft was seen, heading down into the dark.”



Happy ending, back in pure air. Salomi cave.

Photo by Roman Hapka, 2023

Towards the end of the expedition a team of four returned to Salomi Cave in order to continue or finish exploration and survey. After adding 20 more vertical meters they had to call defeat due to "bad air" or high carbon-dioxide concentration. They saw that the cave continued down, but taking the risk was out of the question. So officially the surveyed cave length of Kijingvong Long Khün stands at 335 m with a remarkable vertical range of 112 m. Currently it is the longest and deepest cave in Nagaland.

[expedition diary] ... "Roman continued rigging the second pitch, and then placed bolts for the third. He continued down, and then shortly afterwards exclaimed for a quick survey leg to the next station; there was bad air and he was coming back up. He came back up, gasping. [...] After a quick discussion about the risks, I [Oliver] decided to descend down. With a few survey sprints and a quick drawing, I descended further down through a tighter hole [...] I reached the end of the rope, a short, greasy ~2-3 m climb to the chamber below. I decided not to free-climb, and ascended back up. Gasping the whole way up, through the tight section and continuing back to the pitch-head. The air was definitely bad."

On the last day, before packing-up, the Salomi Team explored and surveyed Nikib Betah Khun, a cave down in Likimro Valley that was said to be a vertical shaft with a stream below. So, the team carried rope, SRT kits, and bolting gear down, but the cave was relatively small and, typical for the region, formed along a rift and obstructed by boulders. There was a small active stream-way flowing underneath and eventually out to daylight, joining the river after a short distance. The cave was surveyed to a length of 39m and a vertical range of -17 m.

KIJINGVONG LONG KHUN

CAVE <i>Kijingvong Long Khun – Salomi Cave</i>						
LENGTH <i>335m</i>		VERTICAL RANGE <i>112m (-95m / +17m)</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Thomas Arbenz 20/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°47'11.7"</i>	<i>094°53'35.2"</i>	<i>1778 m</i>	<i>+/- 10m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Salomi</i>

Location

Starting from the football pitch in Salomi at N25°47'36.4"/E094°53'35.2"/1863 m asl. In the eastern Corner there is footpath to SE with steps into a gully and up to another footpath heading NE. Past the last houses of the village the path is leading steeply down to a cultivated area which is traversed to south to pick up the proper path to the cave. It is a very narrow path traversing the steep slope, steadily dropping until reaching an exposed point where the cliff area starts. Scrambling down and following the exposed natural steps for about 30 metres accesses the cave entrance.

Description

Relic collector cave on two levels with vertical rift-controlled relic drain

Vertical Part:

A short approach slot is leading to the first pitch where the cave enlarges enough to allow standing on a ledge just below the lip. At this point the passage enters the top of a chamber approx. 5 m wide and 12 m deep. Looking to the right the chamber wall is about 15 m to 20 m away and appears to rise sharply and the roof is home to a large bat colony. Also noted was a draught at ceiling height that disappeared to the left over a col about 4 m away. A short drop of about 3 m, and a bit of climbing is leading to the col. This allows a view down into an equally large chamber with a generous swirling of bats. Two ropes rigged in sequence allow access to the bottom of the bat roost chamber. From there, following down the inclined guano filled chamber a narrowing at the far end and a descending rift is reached. A climb over and abseil down the rift gives access to another chamber and a further 17 m descent. This was descended and a continuation down was observed, however, surveying had to be stopped at this point due to bad air (high CO2 concentration) which affected the explorers alarmingly. Further exploration is considered to be too dangerous.

Horizontal Part:

After 40 m of descending passage (ca20°) of walking size passage a 3-way junction splits the horizontal level into 3 separate passages. To the right a steady slope, slightly steeper on the right, ends in sediment touching the roof. To the left the gallery leads to a chamber which further branches to the left and right, the chamber self is down-sloping. The branch to the left of the chamber is a climb up the passage where it ends in boulders. The branch to the right of the chamber with a column in the center forming an oxbow, is again leading upwards to end in a boulder choke.

Particular Details

Tackle: *2x 25 m, 2 x 18 m, 5 Slings, 4 bolts/hangers*

Restriction: *The cave is under tourist cave scheme performed by the Salomi Student's Union. Visitors are obliged to take one of their guides to get access to the cave. There is a fee of (100 INR/ 01/2023) per visitor.*

KIJINGVONG LONG KHUN (SALOMI CAVE)

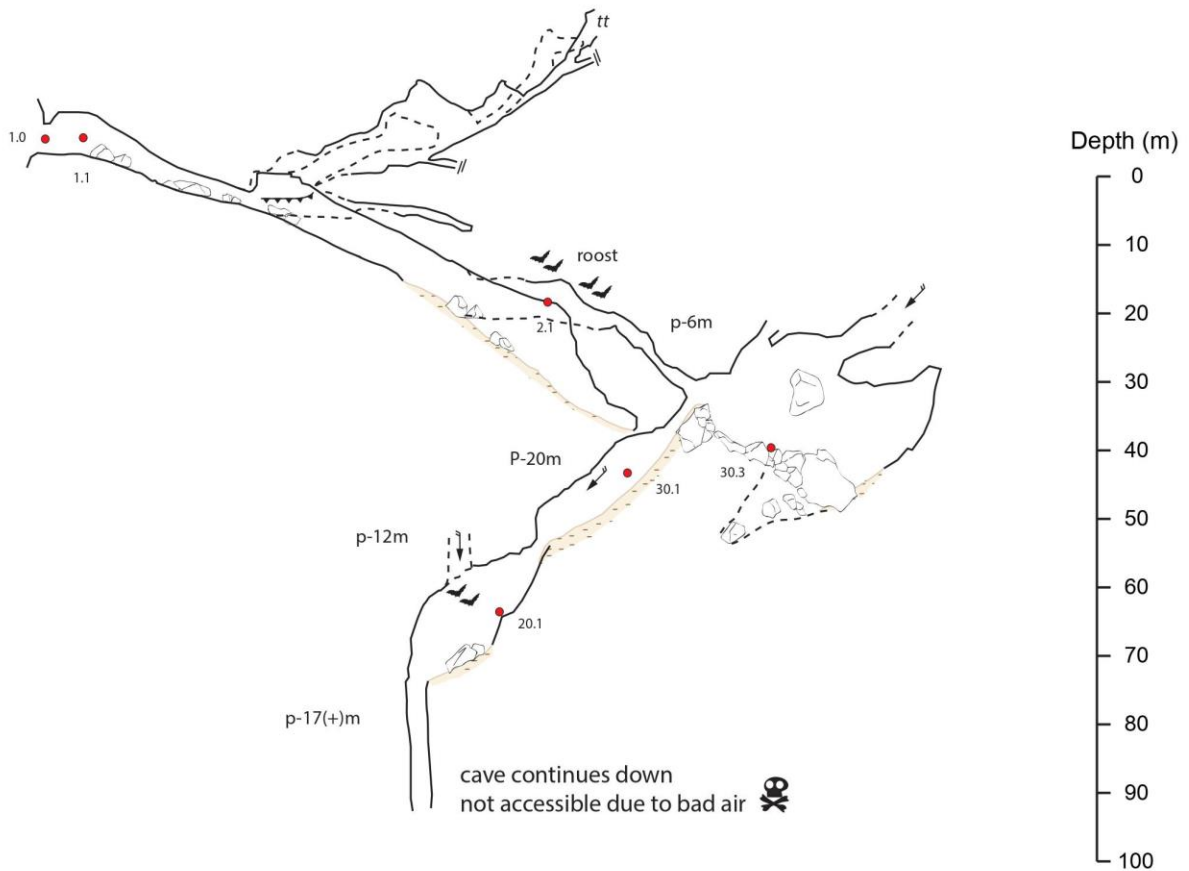
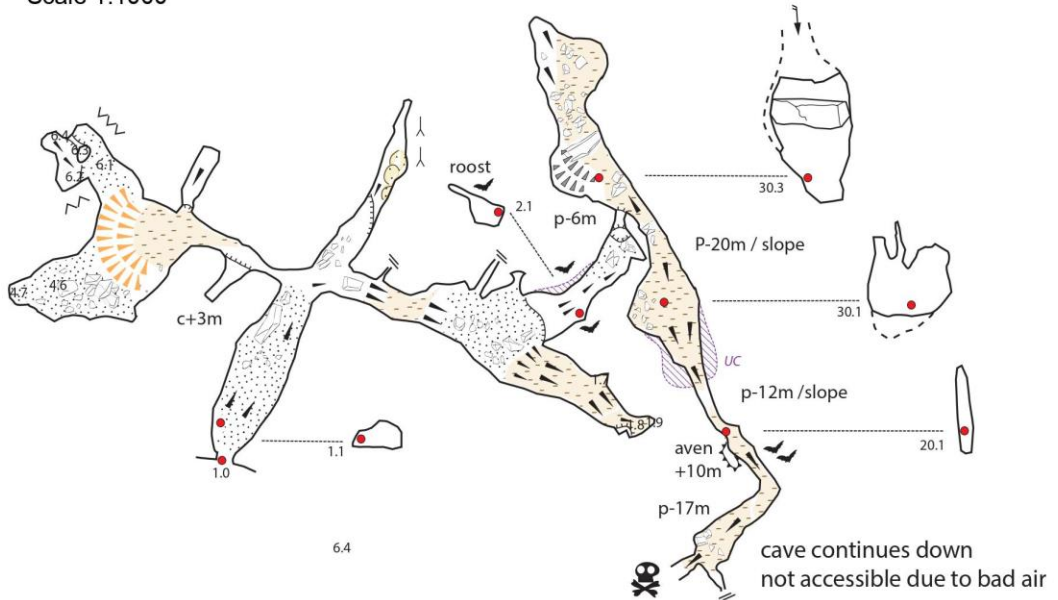
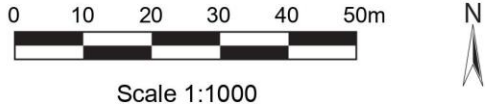
Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Mimi

01/01/2023 David Cooke, Richard Hudson, Roman Hapka
Pynshai Syiemiong, Ranald Wahlang, Oliver Legg



Length **355m** Vertical Range **(112m) +17m /-95m**



LUPONG KHUN

CAVE	<i>Lupong Khun</i>	<i>[Blowhole on the Ridge, "Short Khun"]</i>				
LENGTH	12.5m	VERTICAL RANGE	6m (-6m / +0m)			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Tudor Tamas</i> 22/12/2022						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°47'26.0"	094°53'25.9"	1810m	+/- 10m	WGS 84	NG46-12	Salomi

Location

The cave is situated in the reserve administered by Salomi Student Union, east from Salomi village on the top of a marble ridge on the eastern bank of Likrimo River. From the football pitch in Salomi village, cross the valley and follow road east towards the marble ridge until the porch (entrance to the reserve administrated by the Salomi student union). Shortly afterward there is a path to the right, which after 20 m reaches the entrance.

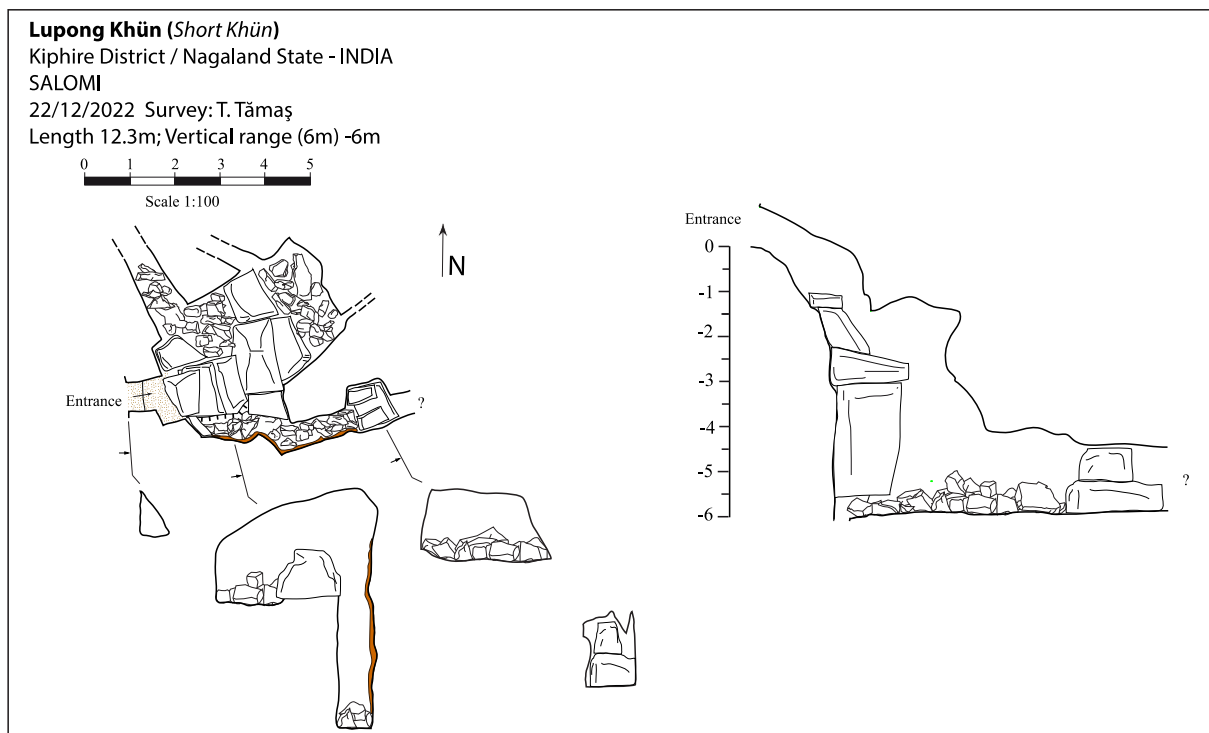
Description

Short relic cave with very strong air current, passage under boulder collapse cemented by calcite. The triangle-shaped, 1 m high by 1 m large entrance gives access to a passage through breakdown that opens in 2 directions; to the left it closes down after 3 m. To the right it descends between blocks down to -6 m, where a tight crossing between a block above and one below gives access to a lead towards east, from where the draught comes.

Particular Details

Tackle: none needed

Restriction: The cave situated in a natural reserve, administered by the Salomi Student's Union. Visitors are obliged to take one of their guides to get access to the cave. There is a fee of (100 INR/ 01/2023) per visitor.



NIKIB BETAH KHUN

CAVE <i>Nikib Betha Khun</i>						
LENGTH <i>39.0m</i>		VERTICAL RANGE <i>17m (-17m / +0m)</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Roman Hapka 04/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°47'01.1"</i>	<i>094°53'38.1"</i>	<i>1039m</i>	<i>+/- 10m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Salomi</i>

Location

The cave is situated in near and downstream from the barrier lake of the Likrimo Hydroelectric Plant.

From Salomi village drive until the dam, from where a footpath is leading down into the Likimro valley. The path is leading steeply downhill on loose soil and vegetation. It takes an hour, to the valey level and along the stream to the cave.

Description

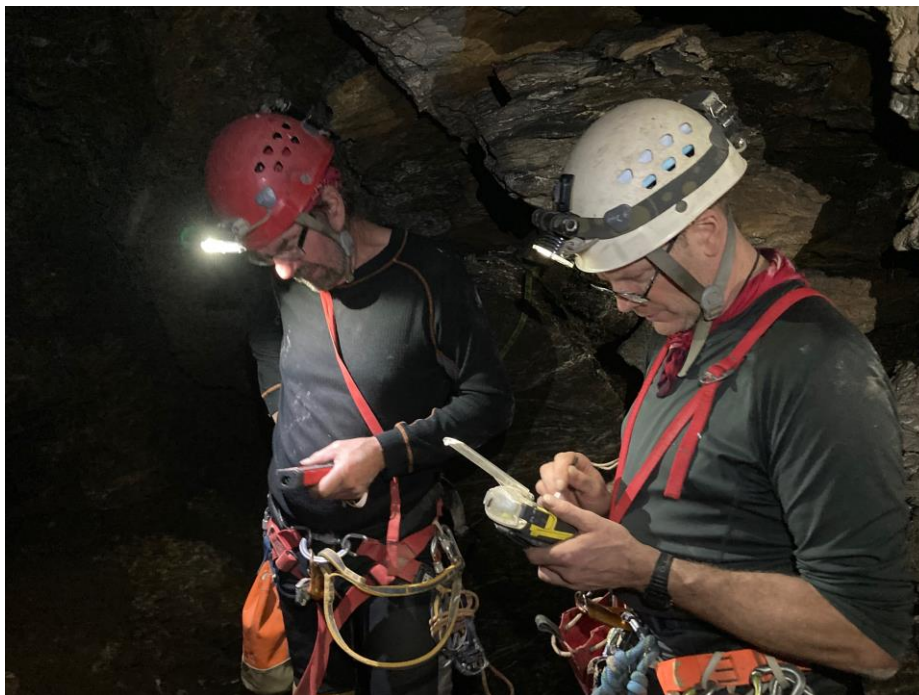
Rift cave, partly tectonic

The vertical entrance gives access to the relatively small cave, formed along a rift. Collapsed boulders block the poddibl continuation. There is a small active stream-way flowing underneath, out of sight and towards daylight, joining the river after a short distance.

Particular Details

Tackle: *20 m Rope*

Assistance: *Vehicle with driver and local guide*



Roman Hapka & Richard Hudson surveying Photo by Ajush Singh 2023

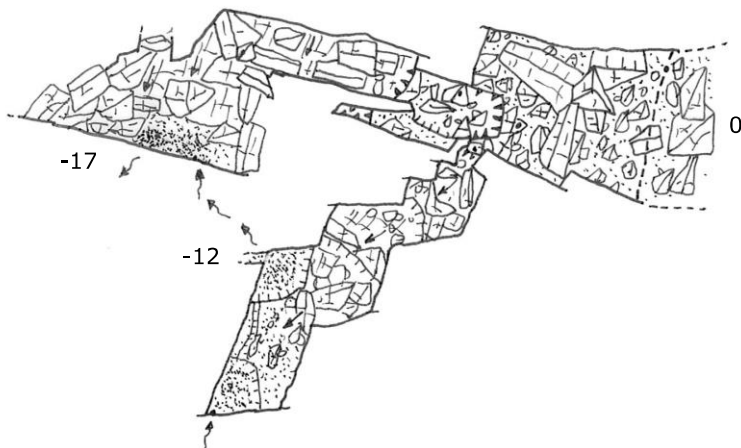
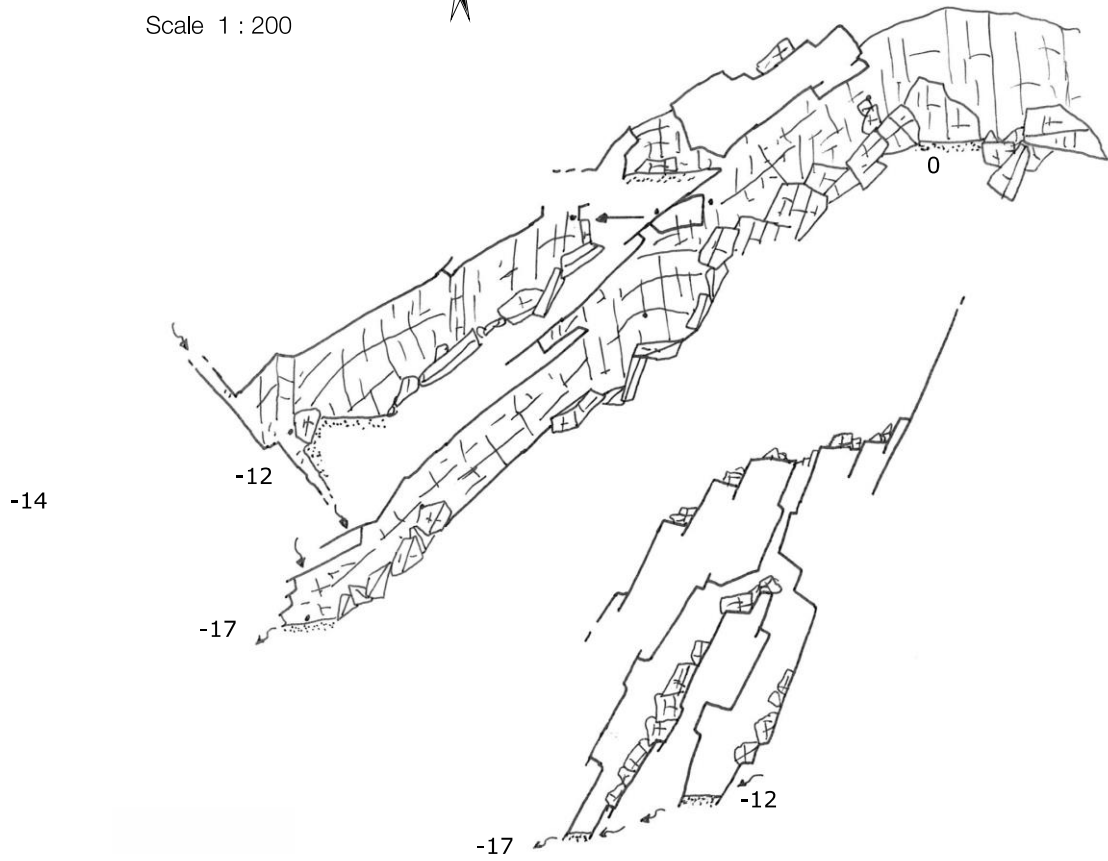
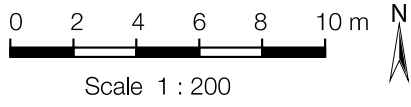
NIKIB BETAH KHUN

Kiphire District / Nagaland State - INDIA

SALOMI NG-46/12 Salomi

04/01/2023 R.Hapka, O.Legg, K.Wann, R.Meyase

Length **39.0m** Vertical Range (**17m**) **+0m** /-**17m**



Main Expedition: Mimi 23rd December – 5th January 2022/23

[expedition diary] ... “ On 23rd December, after 2 days of caving in Salomi, we packed-up and loaded the vehicles. The convoy of 4 vehicles left at 10 am, the journey was meant to be about 4 hours to reach Mimi village, our home base for the next 2 weeks. However, the two local Sumo-Taxis soon left the Pickup (Driver Amos) and the Gipsy (Driver Thomas) behind, knowing the roads much better (and used to treating their cars quite ruthless, by the looks of them).

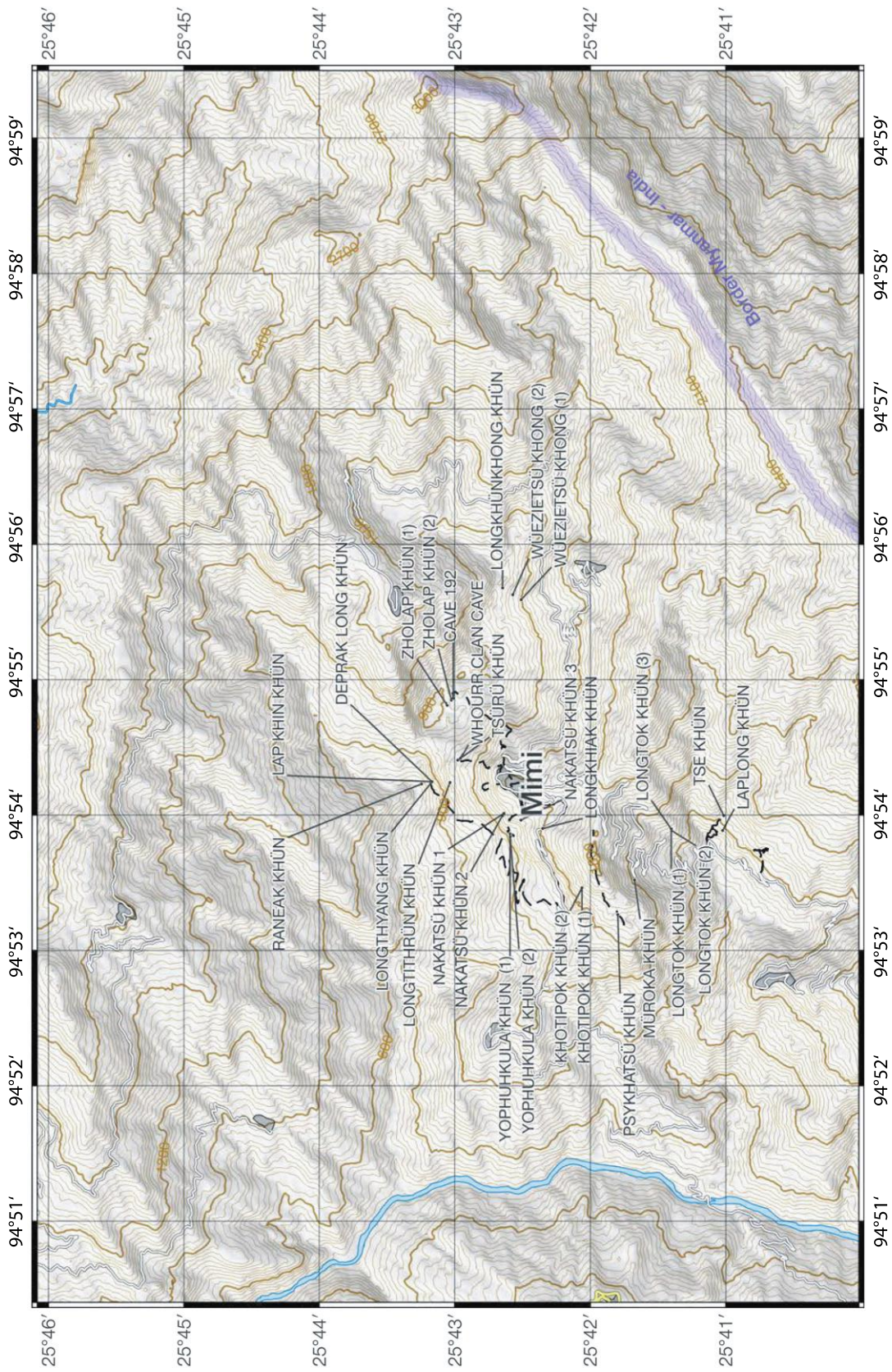
We made our way down to the Likhimro River, guided by the Mimi Headman who had come to Pungro to meet us. The road, or better the track eventually required 4WD, as we had to tackle 2 river fords and several bends with deep muddy ruts. Slowly we made our way up towards the settlement area, situated at around 1400 m asl. We passed several small villages, and eventually met-up with the rest of the team who had been waiting for us for quite a while. The Gipsy with the headman took the lead and in convoy we drove the last bit up to Mimi Village to reach our new home.



Leaving Pungro Base

Photo by David Cooke, 2022

Mimi Overview



CAVES OF MIMI

The caves of Mimi are generally situated on either of 3 levels of altitude: at **ridge level**, around 1700 m to 1900 m they are the remains of drains of relic valleys with sinking streams, at **settlement level**, around 1000 m to 1200 m we find the fragmented pitches of a former vertical drainage system and at **valley level**, at 400 m to 800 m there are the relic resurgence caves of the same. Erosion, weathering and breakdown along with seismic and tectonic events have only left short parts of the former vertical caves which were likely to up to 1000 m deep.

1. RIDGE LEVEL CAVES

Psykatsü Khun, Psykatsü Rift Cave, Khotipok Khun 1, Khotipok Khun 2

PSYKHATSÜ KHUN

CAVE	<i>Psykhatsü Khun</i>		<i>[Mount Psykhatsu Cave]</i>			
LENGTH	<i>42.0m</i>	VERTICAL RANGE <i>17m (-15m / +2m)</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Roman Hapka 28/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'49.7"</i>	<i>094°53'22.7"</i>	<i>1878m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is situated on top and south of Mimi in the vicinity of Betang village, where the motorable road ends. From Mimi (N25°42'34"/E94°54'20"/1279 m) take the black-top road leading up to the army base and to the village of Betan.. The village is sitting on a coll from where Mount Sarmaty, the mountains of the Patkai Range and the Indo-Myanmar border are visible. From the chapel in Betang take the footpath following the ridge in direction of the summit of the Psykhatsu Peak. The cave is situated some 300 m before the summit, 5 m from the trail. It's difficult to spot because of the karstic environment and the high vegetation.

Description

Relic sink cave.

Situated only 5 m from the trail the 2x1 m entrance is difficult to find because of the karstic environment and the high grass. There is cold airflow coming out during the day and going in from late afternoon. The entrance, partially blocked by boulders, gives access to a small descending gallery with some narrow bits reaching a room of 4 m x 3 m. From there an upper gallery and an aven can be followed for a few meters. On the opposite direction (NE), after 7 m the cave is blocked by boulders. Because of the strong airflow the exploring team opened a constriction and it was possible to pass a vertical slot into a slightly bigger room. But large slabs wedged against each other stopped any attempt to go further down.

Particular Details

Tackle: *20 m Rope*

View: *It is more than worthwhile to visit the peak, marked with a large cross on the summit. The spot is an impressive viewpoint with a spectacular view over the valleys and mountains of the Kiphire District.*

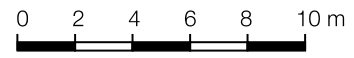
PSYKHATSU KHUN

Kiphire District / Nagaland State - INDIA

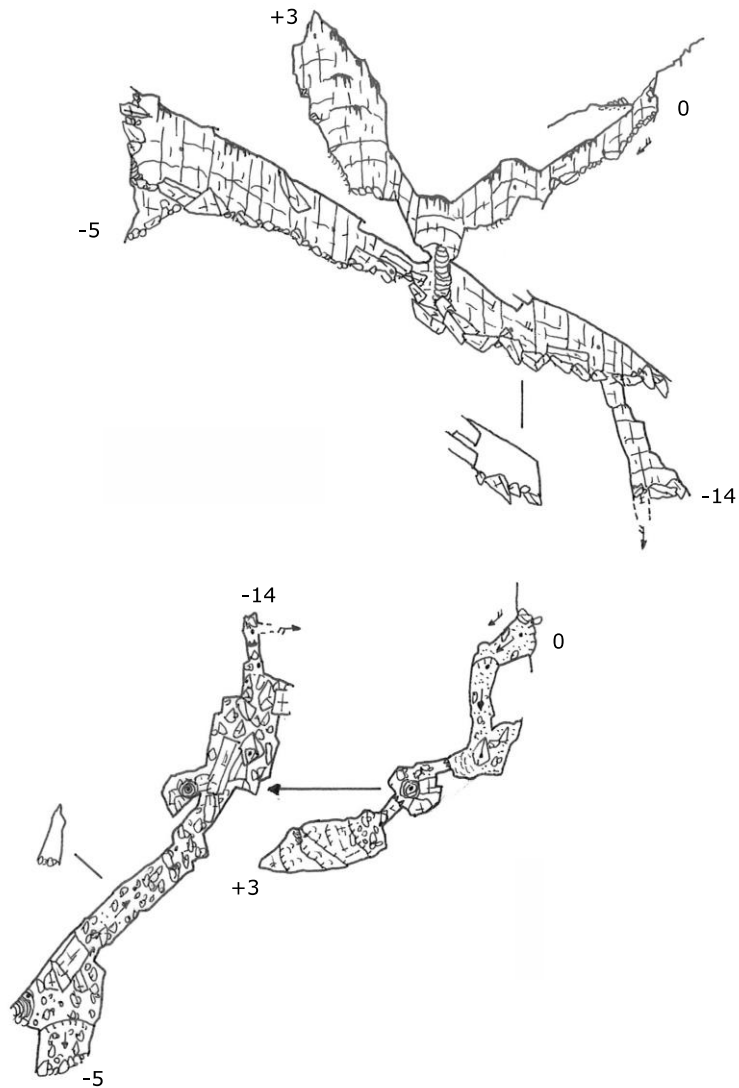
MIMI NG-46/12 Psykhatsu

28/12/2022 R.Hapka, T.Tamas, A.Singh, A.Kenezekho

Length **42.0m** Vertical Range (17m) **+3m /-14m**



Scale 1 : 200



PSYKHATSÜ RIFT CAVE

CAVE	<i>Psykhatsü Rift Cave</i>					
LENGTH	10.0m	VERTICAL RANGE 0m (-0m / +0m)				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Ayush Singh 02/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°41'49.7"	094°52'56.8"	1428m	+/- 20m	WGS 84	NG46-12	Mimi

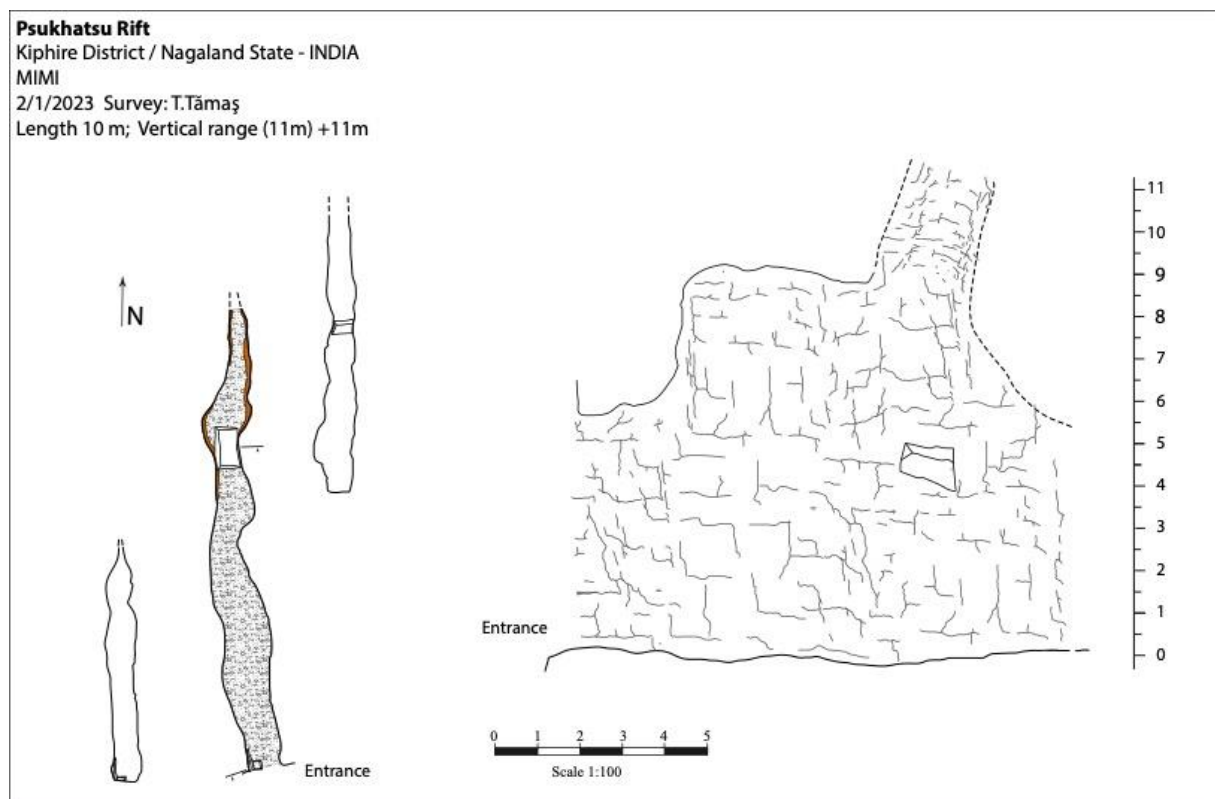
Location

The cave is situated on the southern slope of Mount Psykatsu. To reach it take a footpath starting from the bend on the road to Mutingkhong at the upper limit of the Mimi vegetable plantation. Follow the path through the plantation until the first ridge, then cross the next two ridges wherever possible, following the limestone cliffs above. After the third ridge follow the limestone cliff base until the entrance.

Description

Horizontal cave along a gravitational rift.

The cave is more like a canyon, south to north trending and mostly open to the sky. Dimensions are 1 m wide by 5 m high and a length of 10 m, after which the passage is ongoing but not passable due to flowstone constriction.



KHO TIPOK KHUN 1

CAVE	<i>Kho Tipok Khun 1</i>		<i>[Khotipok 1]</i>			
LENGTH	<i>17.0m</i>	VERTICAL RANGE	<i>9m (-9m / +0m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Tudor Tamas 28/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°42'05.6"</i>	<i>094°53'34.6"</i>	<i>1700m</i>	<i>+/- 8m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

Down from Mimi on the main road heading to Mutingkhong, a tight bend is reached as GPS coordinates: 25° 42' 21.3", 94° 53' 48.7". Follow a well marked path to the cave coordinates for ca. 30-40 minutes

Description

Large arcade (10 m large, ca. 5 m high).

Two entrances separated by a 6 m boulder lead downwards to a sediment fill. The one on the left also connects to a short horizontal crawl which turns right after 7 m.

KHO TIPOK KHUN 2

CAVE	<i>Kho Tipok Khun</i>		<i>[Khotipok 2]</i>			
LENGTH	<i>20.0m</i>	VERTICAL RANGE	<i>5m (-5m / +0m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Tudor Tamas 28/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°42'05.6"</i>	<i>094°53'34.6"</i>	<i>1700m</i>	<i>+/- 8m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

Down from Mimi on the main road heading to Mutingkhong, a tight bend is reached as GPS coordinates: 25° 42' 21.3", 94° 53' 48.7". Follow a well marked path to the cave coordinates for ca. 30-40 minutes

Description

Two rectangular entrances, framed by boulders. The 1st entrance is 1.5 m high by ca. 0.5 m wide; the 2nd entrance is ca. 2x3 m wide with a 4 m pit. The horizontal entrance leads to the right to a small chamber under breakdown; 2 metres further to the left, the passage connects to the 2nd entrance pit coming from the right. Opposite to the 2nd entrance, the passage descends 5 m further under boulders, then turns right along a gravitational rift for 4 further metres; ending in breakdown.

KhoTipok 1 and 2

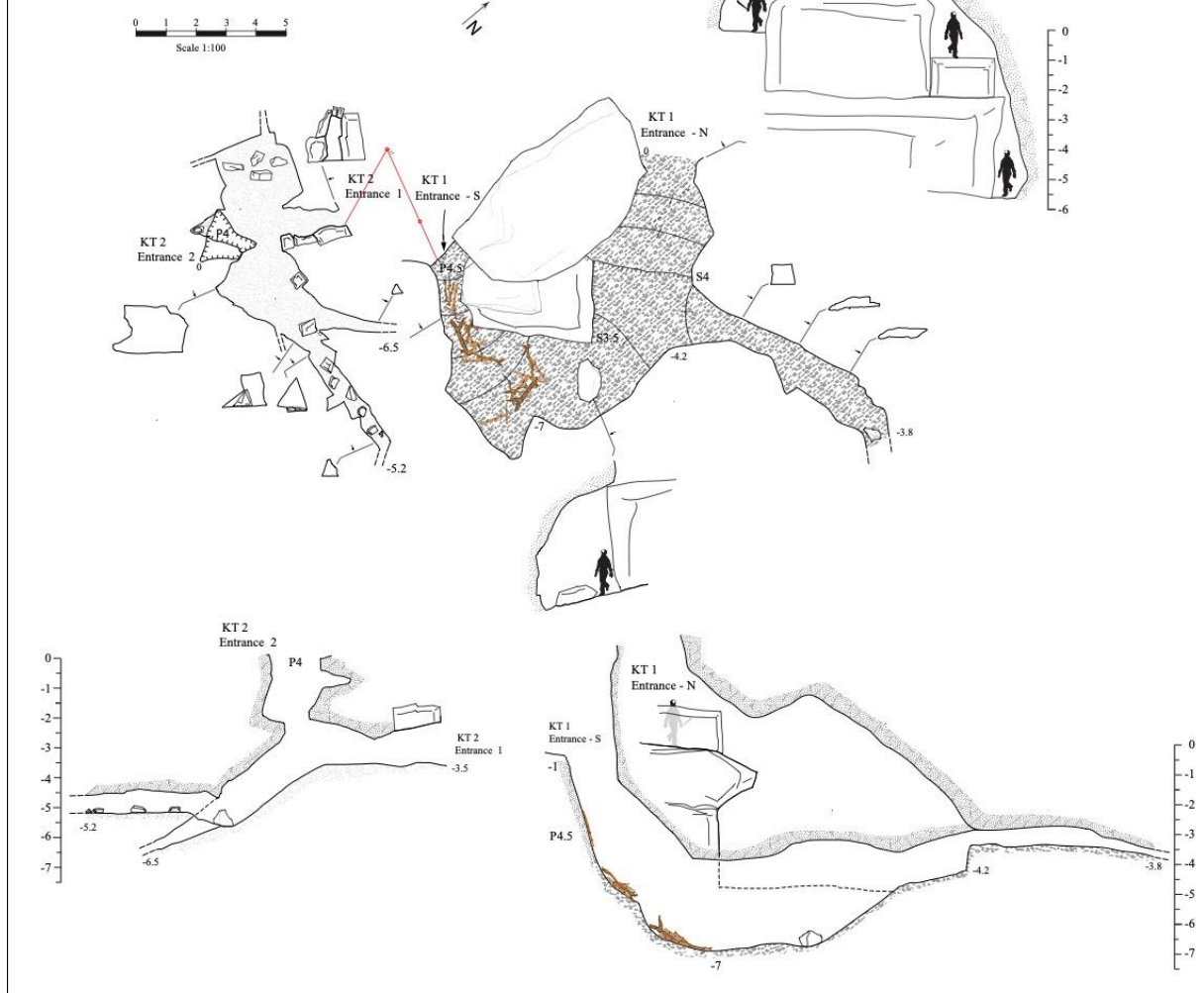
Kiphire District / Nagaland State - INDIA

MIMI

3/1/2023 Survey: T. Tāmaş, A. Keneizekho, R. Hapka

KT1: Length 17 m; Vertical range (7m) -7m

KT2: Length 20 m; Vertical range (6.5m) -6.5m



MÜROKA KHUN

CAVE	<i>Müroka Khun</i>		<i>[Moroka]</i>			
LENGTH	<i>57.0m</i>	VERTICAL RANGE	<i>12m (-12m / +0m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Ayush Singh 28/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'42.4"</i>	<i>094°53'38.1"</i>	<i>1523m</i>	<i>+/- 6m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

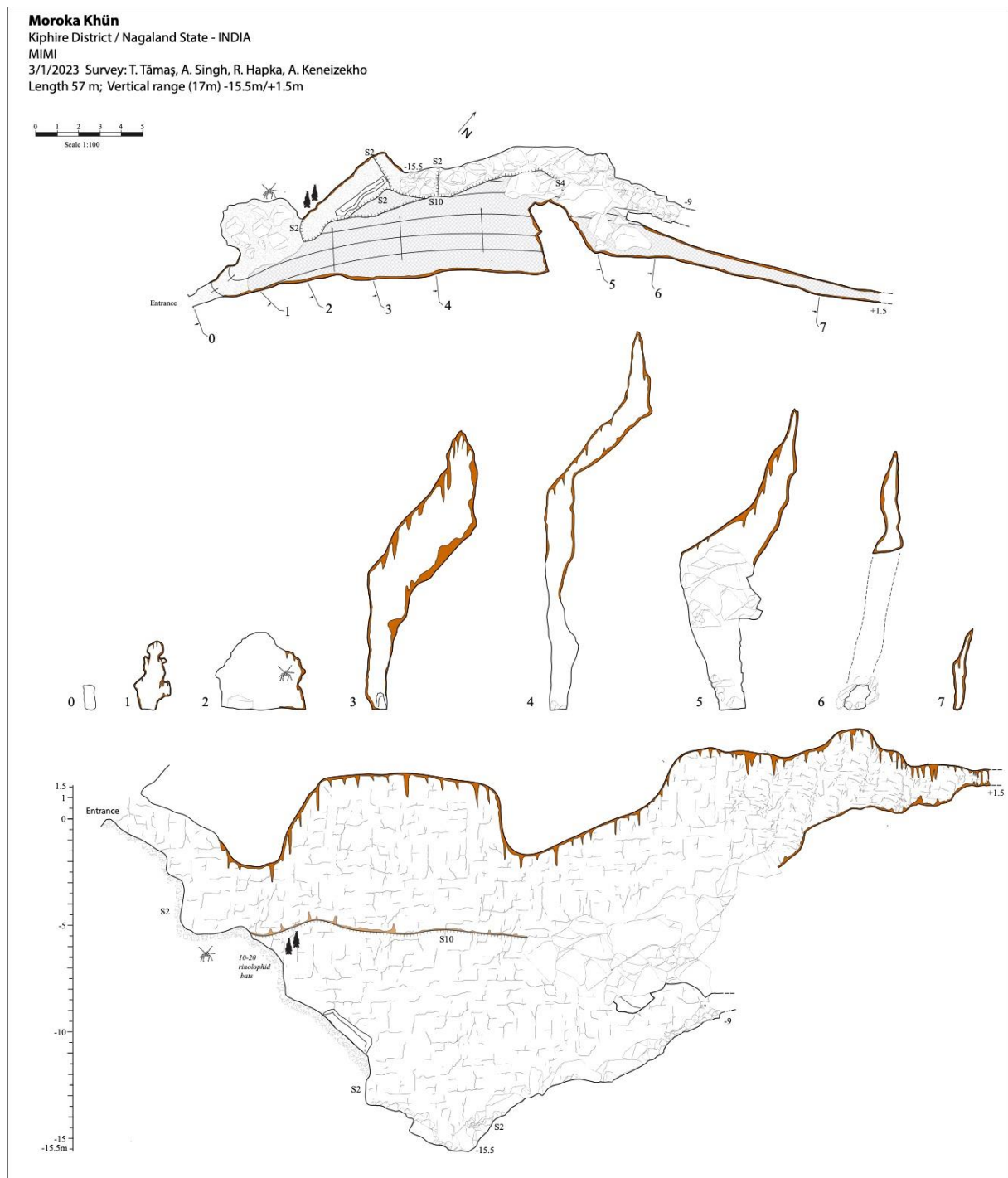
Situated on the right side of the road coming down from Betang at N25° 41' 42.38"/ N94° 53' 38.06".

Description

Relic cave without air current.

A small (0.6 x 2 m) entrance leading to a small chamber developed in breakdown boulders cemented with calcite; further on, 7-10 m high tectonic rift ending in breakdown and speleothem fill.

The entrance gives access to a descending passage followed by a small chamber developed in breakdown boulders cemented with calcite. Further on, two ways: at the top and at the bottom of a high rift towards north east, the bottom of which ends in breakdown; its top part is nicely decorated with calcite flowstone and curtains. A 7 m exposed climb from the bottom of the rift back toward the top leads to a narrow joint which ends in calcite fill after 20 m.



2. SETTLEMENT-LEVEL CAVES

Nakatsu Khun 1/2/3, Yophuhkula Khun 1/2, Longtok Khun 1/2/3, Whourr Clan Cave, Tsürü Khun, Longkhiak Khun, Tse Khun, Laplong Khun

NAKATSÜ KHUN 1

CAVE <i>Nakatsü Khun 1</i>						
LENGTH <i>23.0m</i>			VERTICAL RANGE <i>7m (-7m / +0m)</i>			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Ayush Singh 04/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°42'40.2"</i>	<i>094°54'07.6"</i>	<i>1400m</i>	<i>+/- 9m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

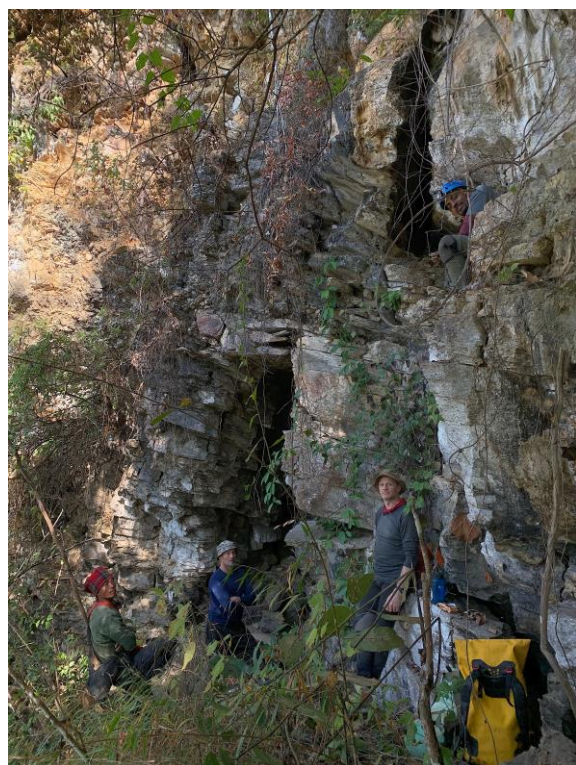
Location

The cave is situated near the fisheries below Mimi. To reach it descend from Mimi Guesthouse to north, pass the fishery about 100 m to the left, past Limsangwo's house and follow a small valley. At 25°42'40.9"/094°54'06.5 the cave entrance is on the left of the valley, 2 m above the thalweg. The walk to the spot takes 25mins from Mimi.

Description

Lateral sink of surface valley, developed on a rift.

The east-facing elliptic entrance, 1 m x 1.5 m, gives access to the slightly descending, south west oriented passage. This is nicely decorated and ends after 20 m in breakdown and sediment fill.



*Nakatsü Khün 3 Entrances
Photo by Tudor Tamas 2023*

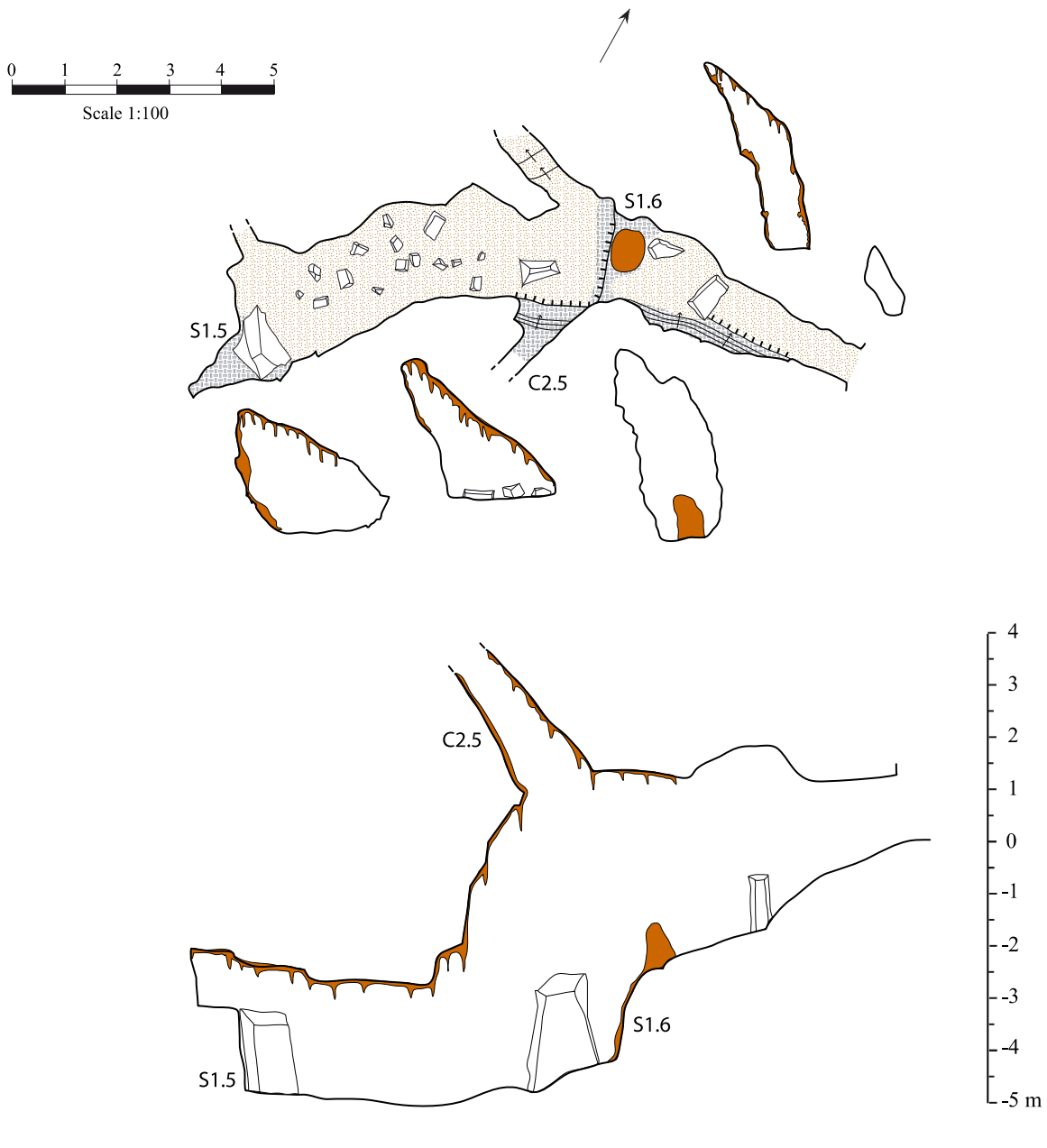
Nakatsü Khün 1

Kiphire District / Nagaland State - INDIA

MIMI

6/1/2023; survey by T. Tämaş, A. Singh

Length 23m; vertical range (8.5m) -5m/+3.5m;



NAKATSÜ KHUN 2

CAVE <i>Nakatsü Khun 2</i>						
LENGTH <i>5.0m</i>			VERTICAL RANGE <i>1m (-0m / +1m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Tudor Tamas 04/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°42'40.9"</i>	<i>094°54'06.5"</i>	<i>1362m</i>	<i>+/- 9m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

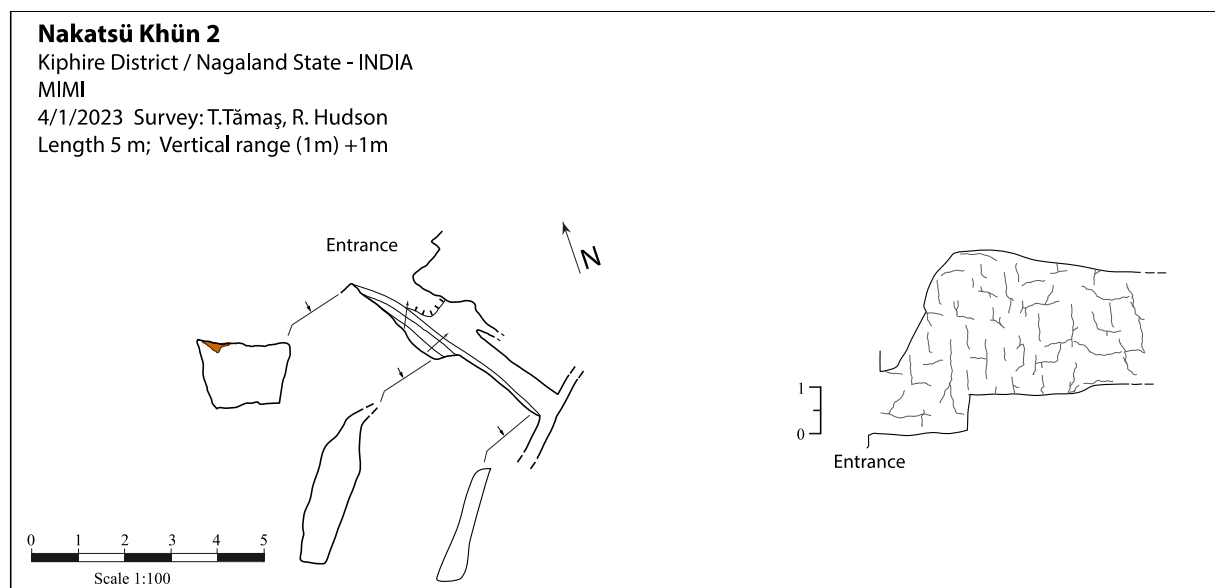
The cave is situated near the fisheries below Mimi. To reach it descend from Mimi Guesthouse to north, pass the fishery about 100 m to the left, past Limsangwo's house and follow a small valley. At 25°42'40.9"/094°54'06.5 the cave entrance of Nakatsü 1 is reached.

Nakatsü 2 is 15 m west of Nakatsü1. Just follow the base of the limestone outcrop for another 15 m. The walk to the Nakatsü caves takes 25 mins from Mimi.

Description

Gravitational rift cave

The entrance is rectangular alcove with a flat ceiling, 1 m high by 2 m wide, facing north west. The cave is a single, narrow passage along a tectonic/gravitational joint with some calcite formations in the entrance alcove. The passage is heading south east to an intersection with a NE to SW oriented fissure, which is too tight to be followed.



NAKATSÜ KHUN 3

CAVE	<i>Nakatsü Khun 2</i>					
LENGTH	19.0 m	VERTICAL RANGE 3.6m (-3.6m / +0m)				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Tudor Tamas 04/01/2023						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'32.7"	094°54'04.6"	1453m	+/- 9m	WGS 84	NG46-12	Mimi

Location

The cave is situated in the Nakatsü area, west from Mimi Guest House, a walk of about 25 minutes away. Descend from the guest house to west and past the small shop, then head south west through house yards and enter the path to Yophuhkula. Follow the path to west

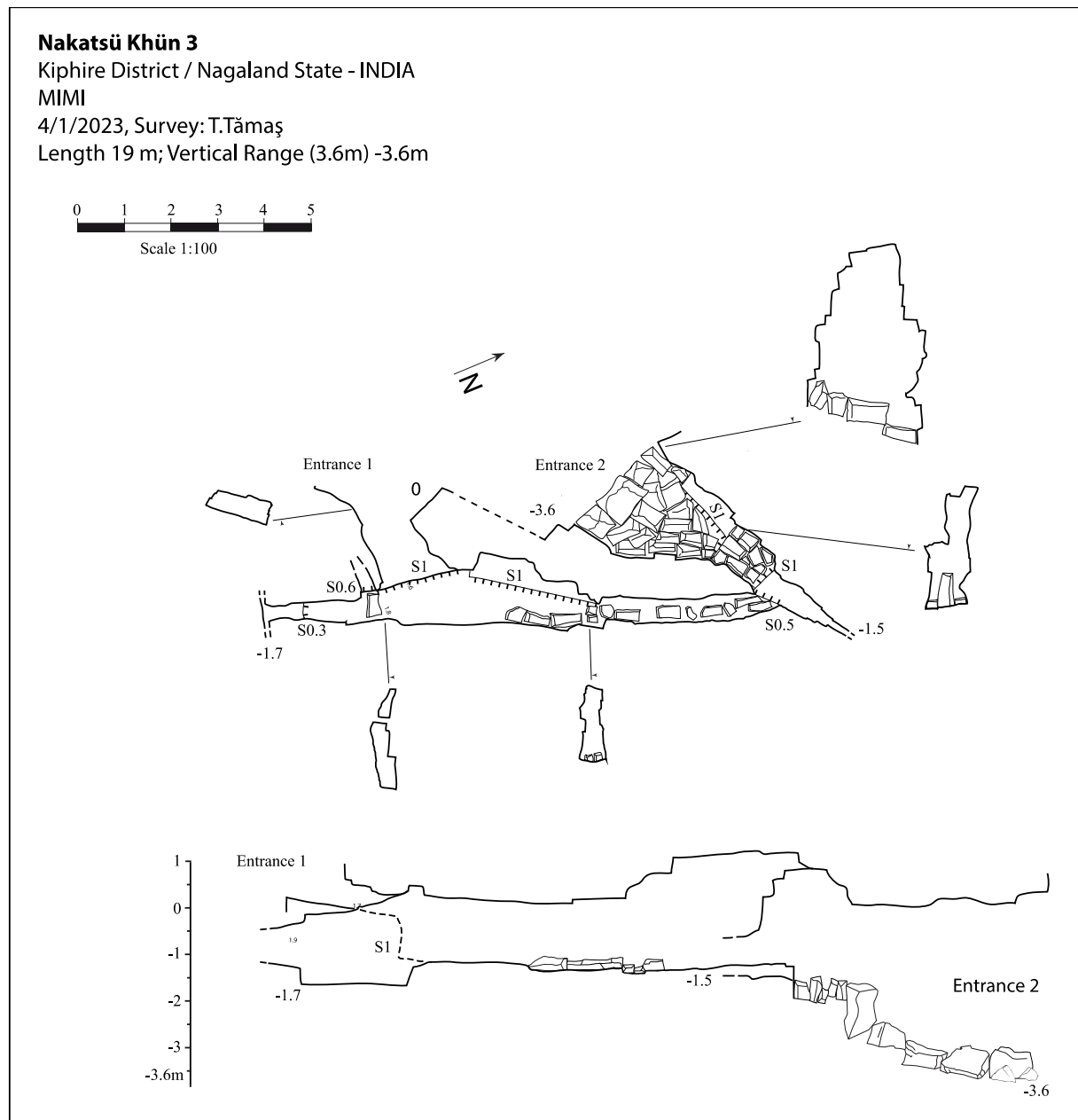
until a very steep, almost vertical slope in the forest. 20-30 m below the edge of the steep slope, head left on an exposed traverse for 50 m to the first marble outcrop.

Description

Intersection of two gravitational rifts in a shattered marble outcrop; two entrances

Entrance 1 (lower), trapezoidal, 3.7 x 2.4 m; Entrance 2 (higher on a ledge and not visible from the base of the cliff), rectangular, 1.5 x 0.6 m; both entrances are facing west.

From entrance 1, a gravitational rift heads NE for 6 m, getting progressively narrower and lower over 2 steps on breakdown; after 4 m, an intersection to the right leads in a very tight rift NNE-SSW (10 m long) parallel to the cliff face, which enlarges from 0.5 to 1 m until the second entrance; the second entrance is to the right, on top of a 1 m drop and leads to a ledge 3 m above the base of the outcrop; further SSW from entrance 2, the rift can be followed for 2 more meters, after which it intersects a NE-SW joint which is too tight.



YOPHUHKULA KHUN 1

CAVE	Yophuhkula Khun 1		[Yopfukala Khun 1]			
LENGTH	55.0 m	VERTICAL RANGE	16 m (-9.7m / +6.3m)			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Pynshai Syiemiong 22/12/2022						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'37.5"	094°53'58.5"	1291m	+/- 6m	WGS 84	NG46-12	Mimi

Location

The cave is situated on the western slope of the Mimi spur ca.200 m below the village. It is impossible to find without a guide. The track starts with a path heading downhill, west from the village, after 30-40 mins reaching to the northern escarpment of a steep valley, where some downhill climbing brings you to the cave entrance.

Description

Relic cave without air current.

The entrance is rectangular shaped, 4 m high by 2 m wide. It gives access to a large high passage with several large old speleothems. After ca. 20-30 m, another passage connects from the right: it is steeply ascending and connects to the right with a 3-step aven that ends too tight to be followed-up.

Particular Details

Features: Various old calcite speleothems (stalactites, wall flowstone); abundant calcium phosphate crusts (probably hydroxylapatite) on the walls; sediment is almost exclusively dry guano.



Rat nest in Yophuhkula Khun 1

Photo by Tudor Tamas, 2022



YOPHUHKULA KHUN 2

CAVE	<i>Yophuhkula Khun 2</i>		<i>[Yopfukala Khun 2]</i>			
LENGTH	123.0 m	VERTICAL RANGE	26.7m (-16.7m / +10m)			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Pynshai Syiemiong 22/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'37.4"	094°53'57.2"	1231m	+/- 6m	WGS 84	NG46-12	Mimi

Location

The cave is situated on the western slope of the Mimi spur ca.200 m below the village. It is impossible to find without a guide. The track starts with a path heading downhill, west from the village, after 30-40 mins reaching to the northern escarpment of a steep valley, where some downhill climbing brings you to the entrance of Yophuhkula 1. Yophuhkula 2 is situated about 50 m further along the slope and 60 m down.

Description

Relic cave without air current.

The entrance is triangular-shaped, 2 m high by 1 m wide and opens a small (1 m x 2 m) short entrance passage perpendicular to a major trunk passage developed along the dip of the limestones (ca 70°); from which several small passages developed as avens and pits take continue with the limestone dip.

The entrance passage gives access to a large gallery along the dip of the limestone, sloping right to left, parallel with the surface valley. The upstream section separates into 5 smaller interconnected side passages. The downstream passage is a steep slope along the dip, freely climbable until a 5 m overhang with speleothems. Once descended, a chamber leads to a short horizontal passage which ends too tight, while an ascending passage seems to have been connected with a pit from the upstream section at some time during the cave's genesis.

Particular Details

Features: Various old calcite speleothems (stalactites, wall flowstone, curtains, popcorn, some pool calcite); abundant calcium phosphate crusts (probably hydroxylapatite) on the walls; sediment is almost exclusively dry guano. There is a large (3-4 m high, up to 50 cm thick) iron oxy-hydroxide intercalation in the limestone: probably limonite (goethite) and hematite.



LONGTOK KHUN 1

CAVE	Longtok Khun 1		[Coffin Cave 1]			
LENGTH	37.0 m	VERTICAL RANGE	7.0 m (-7m / +0m)			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Roman Hapka 31/12/2022						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°41'21.6"	094°54'00.7"	1394m	+/- 20m	WGS 84	NG46-12	Mimi

Location

The cave is situated close to the road near Betang village. From Mimi drive to Betang (Army Checkpoint mid-way), then follow the road downhill until an evidently isolated limestone cliff on the left with a large cave entrance on top, visible from the road. A path from the road bend is leading uphill and upstream. Leave the path about 50 m higher than the road, then head-on through jungle (no path), across a valley in which a permanent stream is flowing. Up on the left bank and straight across the slope you reach a col in front of the limestone cliff. Descend to the right of the cliff by following its base. The entrance is reached after 50 m, below some evident speleothems in the cliff face.

Description

Straight descending passage along anticline fold

The entrance part is a single opening 1 m wide by 2.5 m high with a skylight joining after 5 m. The straight passage is 37 m long and reducing in height from 8 m inside the cave to its end, descending at approx 5-10 degrees to a low impassable end with a slight draught. Three empty coffins of hollowed-out logs were found at a short distance inside the cave. At the back of the cave there were the remains of a small rock wall and beyond this a few pot shards, broken clay pipe and a small intact pot were seen.

Particular Details

Cultural Relevance: Burrial cave. The passage contains 3 full size empty coffins as well as a complete pot and a number of pot shards and a fragment of a pipe. Archaeological details and context, see: Chapter Archaeology.



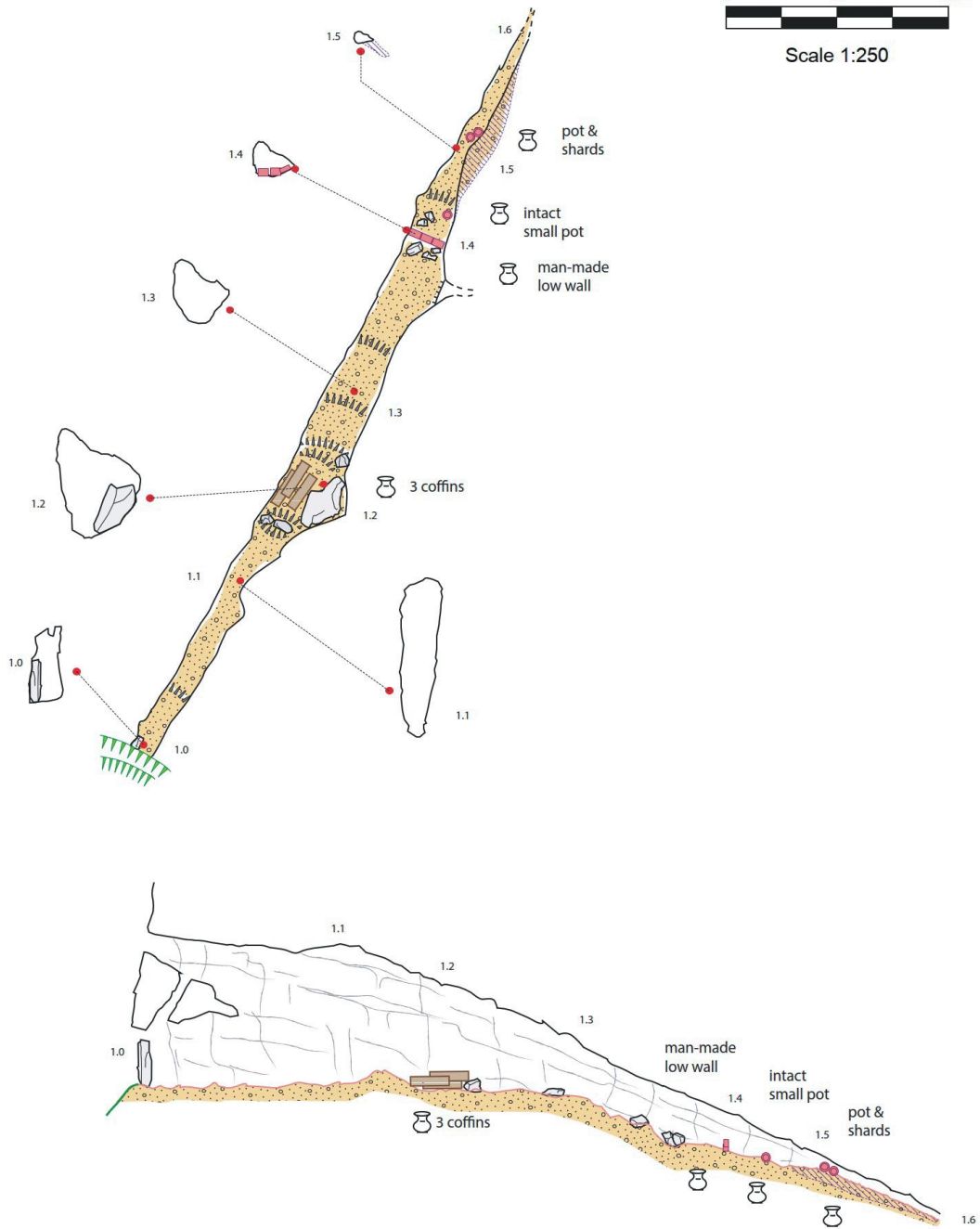
Remains of 3 one-log coffins in Longtok Khun

Photo by Pynshai Syiemiong, 2023

LONGTOK KHUN (1)

Kiphire District / Nagaland State - INDIA
MIMI NG-46/12 Betang
31/12/2022 Richard Hudson

Length 37m Vertical Range (7m) +0m /-7m



LONGTOK KHUN 2

CAVE	<i>Longtok Khun 2</i>					[Coffin Cave 2]
LENGTH	<i>unsurveyed</i>	VERTICAL RANGE <i>unsurveyed</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Roman Hapka 31/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'26"</i>	<i>094°54'00"</i>	<i>1400m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is situated close to the road near Betang village.

From Mimi drive to Betang (Army Checkpoint mid-way), then follow the road downhill until an evidently isolated limestone cliff on the left with a large cave entrance on top, visible from the road. A path from the road bend is leading uphill and upstream. Leave the path about 50 m higher than the road, then head-on through jungle (no path), across a valley in which a permanent stream is flowing. Up on the left bank and straight across the slope you reach a col in front of the limestone cliff. Descend to the right of the cliff by following its base. After 50 m the entrance of Longtok 1 is reached. From here a steep climb up the outcrop with rather flaky, unstable rock leads to the alcove which is the entrance of Longtok 2.

Description

Alcove in cliff face with possible continuation.

A rather exposed climb to a cave in the rock face. A bleached fragment of a human skull was found on a rock ledge near the base of the climb. The cave was not fully entered as the last bit of the climb was too sketchy without proper climbing gear. But it seemed to be just an alcove. It contained some small coffin-like hollow logs, presumably containing bones.

Particular Details

Cultural Relevance: *Burial cave.*

Tackle: *Climbing and bolting gear needed.*

LONGTOK KHUN 3

CAVE	<i>Longtok Khun 3</i>					[Nettle Cave]
LENGTH	<i>16m</i>	VERTICAL RANGE <i>7.0 m (-7m / +0m)</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Roman Hapka 31/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'26.1"</i>	<i>094°54'00.7"</i>	<i>1394m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

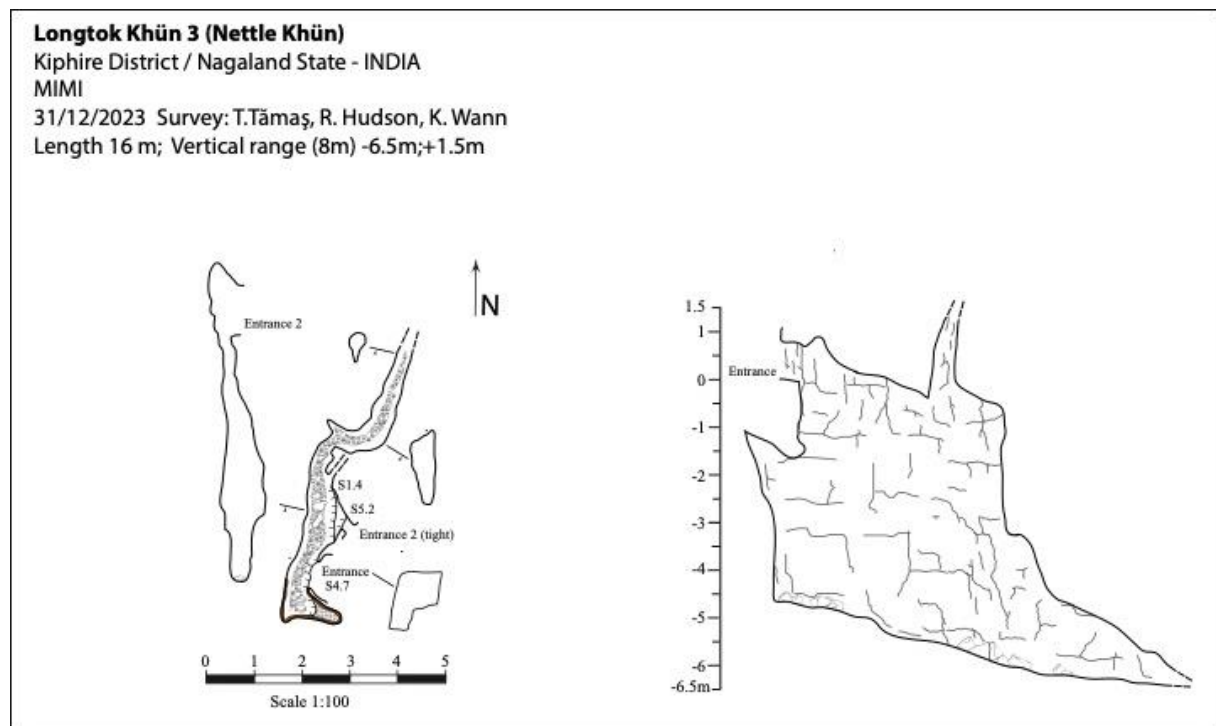
The cave is situated close to the road near Betang village.

From Mimi drive to Betang (Army Checkpoint mid-way), then follow the road downhill until an evidently isolated limestone cliff on the left with a large cave entrance on top, visible from the road. A path from the road bend is leading uphill and upstream. Leave the path about 50 m higher than the road, then head-on through jungle (no path), across a valley in which a permanent stream is flowing. Up on the left bank and straight across the slope you reach a col in front of the limestone cliff. Descend to the right of the cliff by following its base. After 50 m the entrance of Longtok 1 is reached. Longtok 3 is just next to Lontok 1.

Description

Short canyon cave, relic drain.

A 5 m drop from the rectangular, 1 m by 1 m, entrance reaches the bottom of a canyon that can be followed to north for a few meters. After a short squeeze, the cave ends in sediment fill. A skylight 2 m above the entrance has a draught coming from above, but the passage is too tight. A part of the former cave was eroded and speleothems can be seen on the cliff above the entrance



WHOURR CLAN CAVE

CAVE	<i>Whourr Clan Cave</i>		<i>[Whourr - Merr Clan Cave]</i>			
LENGTH	35m	VERTICAL RANGE	7.0 m (-5m / +2m)			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by David Cooke 25/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'59.3"	094°54'32.0"	1244m	+/- 6m	WGS 84	NG46-12	Mimi

Location

Situated by the old settlement Thsürü situated on a wide ledge about 300 m below and south-east of Mimi Village. To reach it take the road to the East of Mimi town. A footpath leaves the left side of the road to the NE at the switch-back (N25° 42' 40.1" E94° 54' 29.1") going steeply downhill. Be careful to select the correct footpath. There is another footpath leaving here, more to the north and level. Follow the footpath down for 400 m to a T-junction (N25° 42' 41.6" E94° 54' 38.0"), go left to the north. Follow the footpath down for 80 m to a T-junction (N25° 42' 43.5" E94° 54' 37.1"), go left to the NW. The footpath becomes more horizontal. Follow the footpath down for 400 m to a T-junction (N25° 42' 53.4" E94° 54' 29.4"), go right to the NE becoming north. After 150 m the footpath crosses the Tsuru village meeting stone (N25° 42' 57.4" E94° 54' 31.2"), a large flat stone. The village is now abandoned but evidence of it is all around. Continue north along the footpath for 60 m to a Y-junction (N25° 42' 58.8" E94° 54' 30.4"), right to the NE. The path becomes indistinct and there are several. After 50 m there is a stone fireplace (N25° 42' 59.5" E94° 54' 32.0"). The cave entrance (N25° 42' 59.3" E94° 54' 32.0") is approx 20 m to the SE down a steep path then a short traverse. A 20 m handline is useful.

Description

Relic rift-controlled cave with abundant calcite formations.

The cave has a triangular shaped entrance (1.5 m wide by 1 m high) in low cliff on a very steep slope, facing north east. The first 25 m of the cave are used to keep the remains of the ancestors of the clan. They are deposited in urns (round pots with wide open neck and slate lid). Walls and roof are calcited (flowstone and stalactites). The floor is mainly breakdown filling a rift. After 12 m a slope at a constriction leads to a second chamber. The general orientation of the cave is SW to SSW.

From the upper chamber there is a continuation: 10 m high meander along a rift heading SW. This is reached by installing an electron ladder of 5 m length. The meander can be followed for 10 m where the 1 m wide and 8 m high passage closes down in a calcite choke. The high reaches get close to the surface, but there is no way on and no outlet.

Particular Details

Cultural Relevance: Secondary burial cave. Access is only possible in the company of a clan member. The site is very strictly guarded and protected by the clan. It is still occasionally visited for spiritual purposes. Details see: Chapter Archaeology.

Biology: The inner chamber directly before the pitch was examined in detail. This chamber was slightly elevated above the floor level of the entrance area and the temperature was significantly higher. Biota was generally sparse. Details see: Biospeleology Chapter.

Tackle: 20 m Handline, 5 m ladder, 3 slings, 3 carabiners.

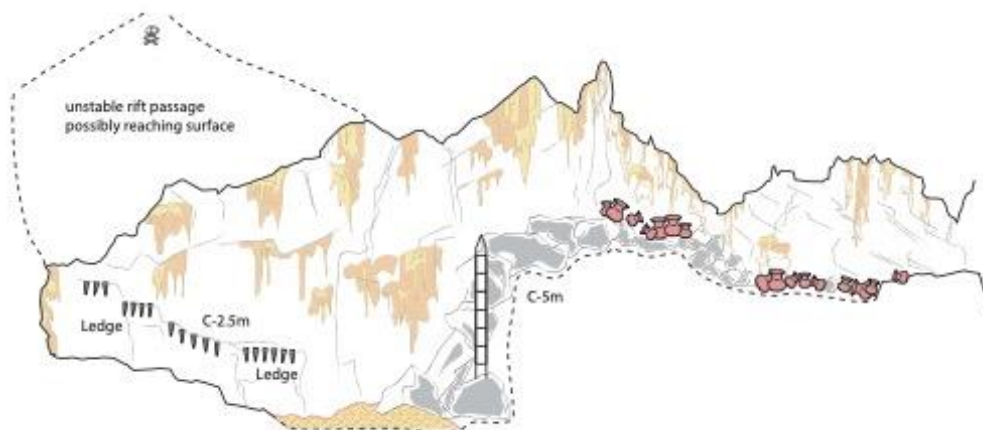
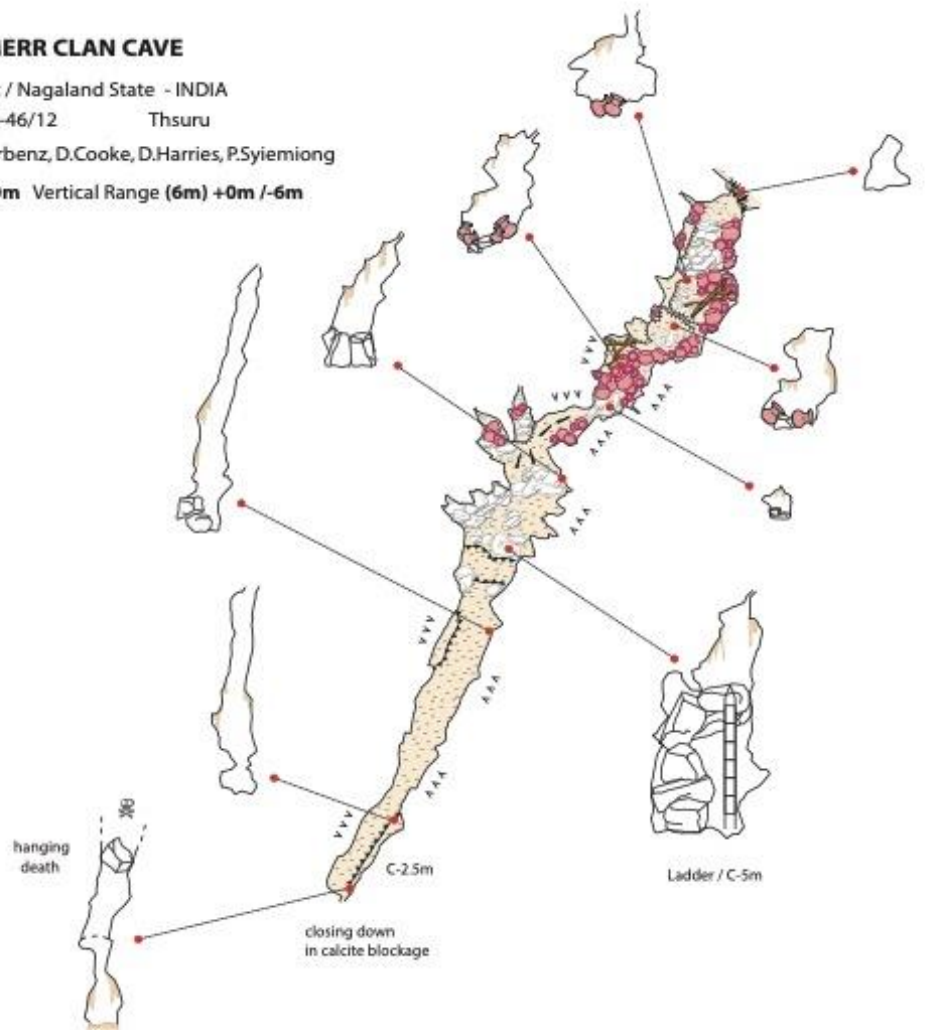
WHOURR-MERR CLAN CAVE

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Thsuru

23/01/2023 T.Arbenz, D.Cooke, D.Harries, P.Syiemiiong

Length **35.0m** Vertical Range **(6m) +0m /-6m**



THSÜRÜ KHUN

CAVE	<i>Thsürü Khun</i>		<i>[Tsuru Khun]</i>			
LENGTH	27m	VERTICAL RANGE	6.0 m (-6m / +0m)			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Thomas Arbenz 03/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°43'00.5"	094°54'31.2"	1279m	+/- 3m	WGS 84	NG46-12	Mimi

Location

Situated by the old settlement Thsürü situated on a wide ledge about 300 m below and south-east of Mimi Village. To reach it take the road to the East of Mimi town. A footpath leaves the left side of the road to the NE at the switch-back (N25° 42' 40.1" E94° 54' 29.1") going steeply downhill. Be careful to select the correct footpath. There is another footpath leaving here, more to the north and level. Follow the footpath down for 400 m to a T-junction (N25° 42' 41.6" E94° 54' 38.0"), go left to the north. Follow the footpath down for 80 m to a T-junction (N25° 42' 43.5" E94° 54' 37.1"), go left to the NW. The footpath becomes more horizontal. Follow the footpath down for 400 m to a T-junction (N25° 42' 53.4" E94° 54' 29.4"), go right to the NE becoming north. After 150 m the footpath crosses the Tsuru village meeting stone (N25° 42' 57.4" E94° 54' 31.2"), a large flat stone. The village is now abandoned but evidence of it is all around. Continue north along the footpath for 60 m to a Y-junction (N25° 42' 58.8" E94° 54' 30.4"), right to the NE. The path becomes indistinct and there are several. After 50 m there is a stone fireplace (N25° 42' 59.5" E94° 54' 32.0"). The cave entrance is through an obvious gap in the old fortification (natural) wall and immediately to the right along an open cross-rift into the cave.

Description

Tectonic rift cave with boulder roof

The entrance is a naturally formed 1 m wide ditch, which is actually a filled-in cross rift. The cave develops along the general dip of the strata. It's basically a single chamber, formed by a 3 m wide gap between two layers of limestone, with a huge boulder as roof on top. There are several openings to the sky and exits to open ground.

Particular Details

Cultural Relevance: *Some artefacts and human bones were observed. Potential archaeological site. The cave is also a part of the old village fortification.*

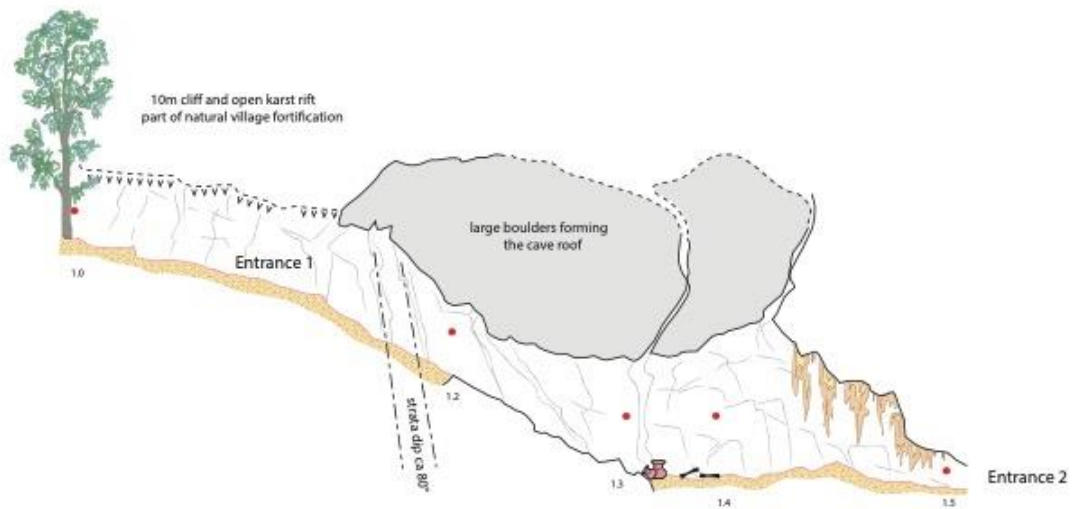
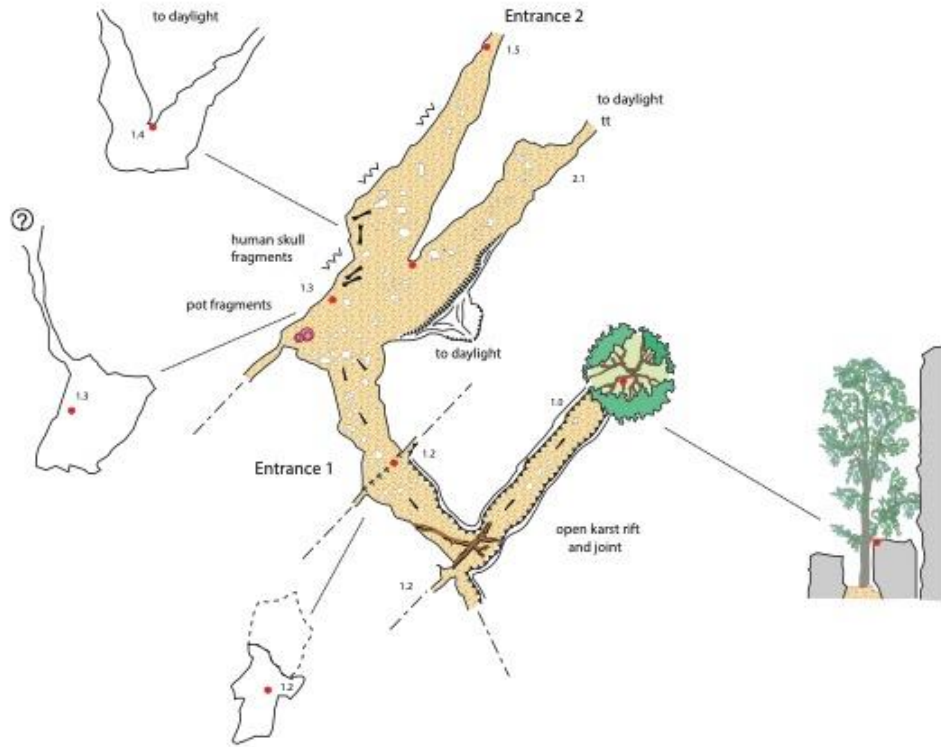
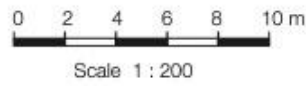
THSÜRÜ KHUN

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Thsuru

03/01/2023 Thomas Arbenz, Pynshai Syiemiong

Length 27.0m Vertical Range (6m) +0m /-6m



LONGKHIAK KHUN

CAVE <i>Longkhiak Khun</i>						
LENGTH <i>41.0m</i>		VERTICAL RANGE <i>35.0 m (-35m / +0m)</i>				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>David Cooke 03/01/2023</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°43'03.1"</i>	<i>094°54'21.6"</i>	<i>1100m</i>	<i>+/- 5m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is located on steep forested slope below Mimi village. Approximately 30-45 minutes' walk from the village. Approach initially along narrow forest footpaths down the north-eastern slope below the village. The final approach is across trackless ground - therefore a local guide is essential for the relocation.

Description

Dry relic passage. Predominantly vertical and rift-like. Possibly a tectonic rift but not properly evaluated.

The cave is rift like in appearance and entirely vertical, separated into pitches by sloping ledges. The cave is a short series of pitches down a rift, all dry relic passage. It is very dry throughout. Loose rocks in upper parts present a hazard. Dry forest soil present on ledges (fallen down from entrance). Calcite deposits not evaluated but no signs of any recent waterflow.

Particular Details

Safety: *Generally hot and airless. The bottom end of cave appeared to have high carbon dioxide levels.*

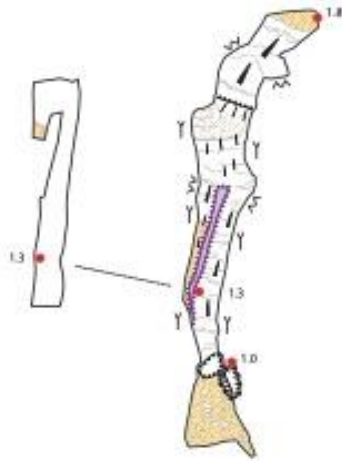
Biology: *A live rat was seen, plus two rat's nests. Details see: Biospeleology Chapter.*

Tackle: *40m Rope*



Long Khiak Khun 1st pitch

Photo by Ayush Singh 2023



LONG KHIAK KHUN

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Mimi

03/01/2023 David Cooke

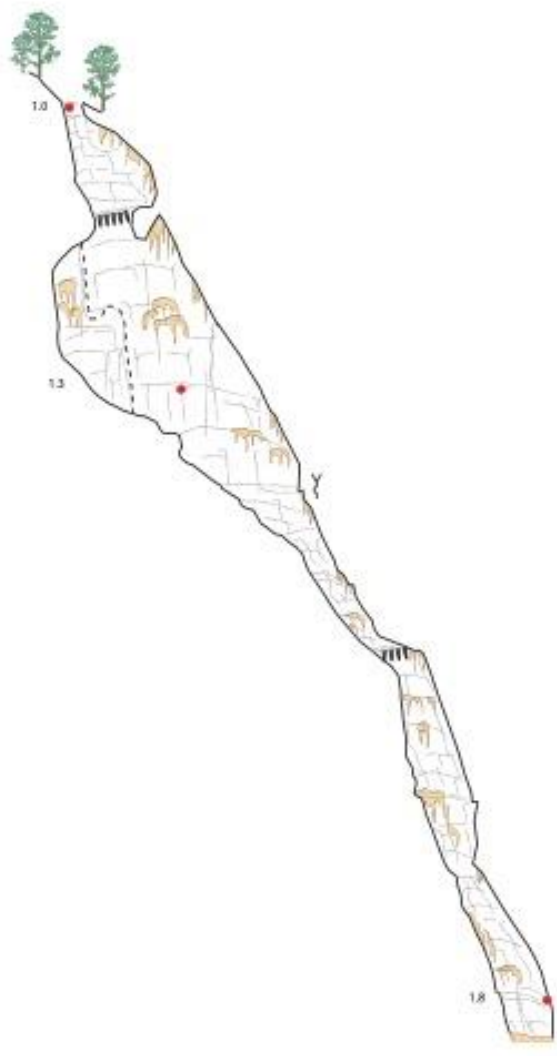
Length **41m** Vertical Range **(35m) +0m /-35m**



Scale 1:250



Depth (m)



WÜEZIETSÜ KHONG 1

CAVE	<i>Wüezietsü Khong 1</i>		<i>[Yuzietsu Khong 1]</i>			
LENGTH	16.3m	VERTICAL RANGE	5.0 m (-5m / +0m)			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Roman Hapka 30/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'32.6"	094°55'42.3"	1293m	+/- 20m	WGS 84	NG46-12	Mimi

Location

The cave is situated North-Est of Mimi, below the old, long and difficult road to Salomi. To reach the cave from Mimi take the ancient road leading to Salomi (and also to the next village visible from Mimi direction East). After going down for half an hour, take a left hand footpath and walk down for 20 min following a ridge. The vertical entrance of the cave is in the middle of path so the local people close it for security with some flat stones. A very strong and warm airflow comes out of the hole.

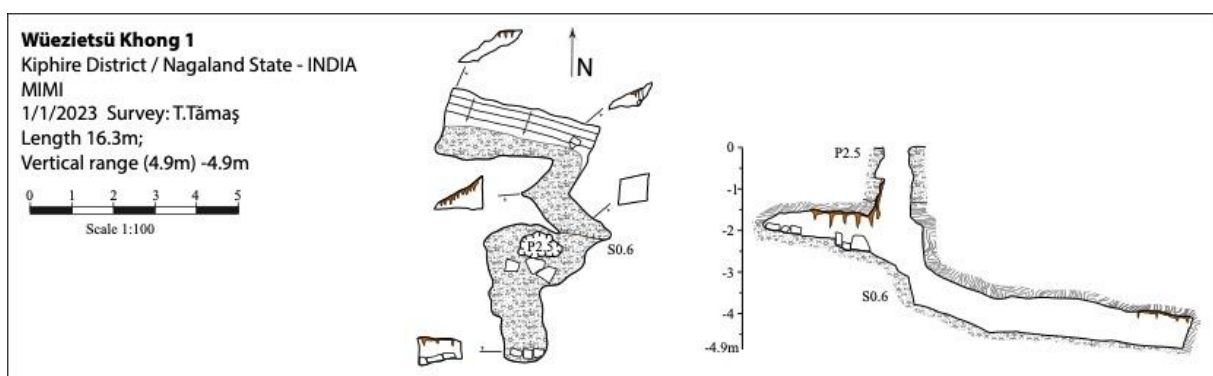
Description

Pothole accessing space in a cluster of breakdown slabs.

The vertical entrance (0.8 m by 0.5 m) is a small shaft of 2.3 m which had to be dug out, because the locals had filled in the hole after a cow had fallen in. A small gallery of 2.5 m covered with flowstone and stalactites leads to south. The horizontal continuation is a 4m crawl between very large boulders with no way on.

Particular Details

Tackle: 10 m Rope



WÜEZIETSÜ KHONG 2

CAVE	<i>Wüezietsü Khong 2</i>		<i>[Yuzietsu Khong 2]</i>			
LENGTH	20m	VERTICAL RANGE	15.0 m (-11m / +4m)			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Roman Hapka 30/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°42'36.3"	094°55'44.5 "	1242m	+/- 20m	WGS 84	NG46-12	Mimi

Location

The cave is situated North-Est of Mimi, below the old, long and difficult road to Salomi. To reach the cave from Mimi take the ancient road leading to Salomi (and also to the next village visible from Mimi direction East). After going down for half an hour, take a left-hand footpath and walk down for 20 min following a ridge. 20 m before the position of Wüezietsü 1 (25°42'32.6"/94°55'42.3") turn right and scramble very steeply downhill following a cliff getting higher and higher to reach 150 m of elevation. The entrance is situated some 8 m up in the cliff. It's an easy climb.

Description

Pothole

The rift gives acces to a 11 m pit (5x3 m) ending on a muddy floor. A second entrance is visible in the roof, 4 m above the entrance. It was tried to reach it, but unsuccessfully because it's awkward position in the cliff. A further rift which maybe continues, is visible in the opposite, but would need some rope work to be accessed. There are some stalactites and flowstone in the cave.



Digging Wüezietsü Khong 1

Photo by Thomas Arbenz, 2022

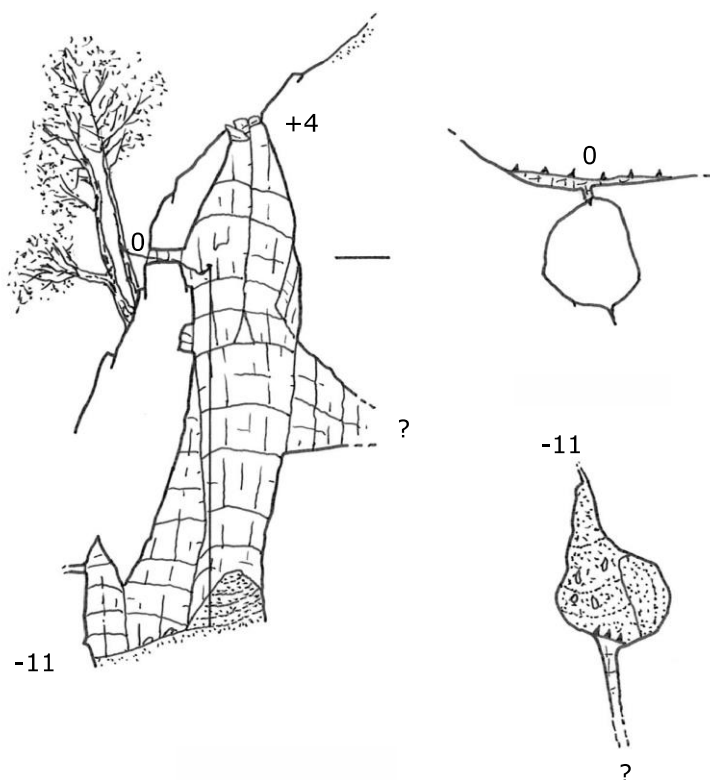
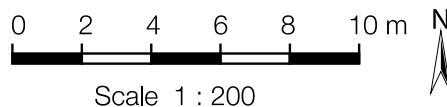
WÜZIETSÜ KHONG 2

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Mimi

30/12/2022 R.Hapka, A.Singh, P.Syiemiong

Length **20.0m** Vertical Range (**15m**) **+4m /-11m**



TSE KHÜN

CAVE	<i>Tse Khün</i>		<i>[Thsu Khun / Sükhen, [Jamir 2014 and 2017: Cave6]</i>			
LENGTH	<i>50m</i>	VERTICAL RANGE	<i>10.0 m (-11m / +4m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Roman Hapka 28/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'02.8"</i>	<i>094°54'06.6 "</i>	<i>1233m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

Tse Khün is situated between Betang and Khongha, by the bottom of the Wawade Waterfall. From Betang, after crossing the first river, follow a very steep trail going up for some 500 m. Follow around the tip of the ridge and continue until at the spot about 30 m above the canyon just by the Wawade waterfall. Follow the canyon for 300 m. Descend to the river and cross it. The entrance of the cave is on the left side of the river, at the bottom of a small cliff, about 30 m above the river.

Description

Relic cave in crystalline Limestone of the Mimi formation

The entrance (1 m by 0.6 m) is blocked by flat stones covered with leaves so that it is very hard to spot. After the small entrance the cave dimensions get larger: the longer bit of the horizontal cave is 40 m long, 8 m wide and 5 m high. Some big boulders nearer the entrance partly covered with calcite are scattered along the right side of the gallery. After this a short climb up a flowstone covered step reaches a narrow passage that can be followed for 10 m. The whole cave is well decorated with speleothems, active and relic stalactites and stalagmites are present all along the cave.

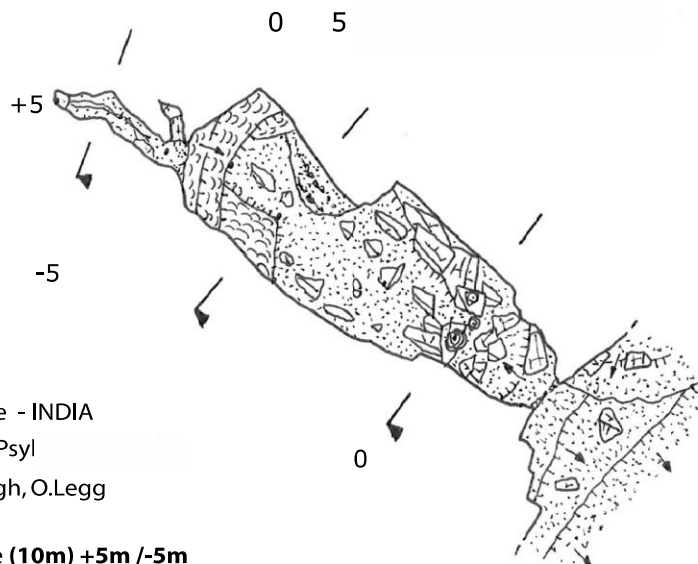


David Cooke, surveying Tse Khun

Photo by Tudor Tamas, 2023



Scale 1 : 500



TSE KHUN

Kiphire District / Nagaland State - INDIA

MIMI NG-46/12 Psyl

26/12/2022 R.Hapka, A.Singh, O.Legg

Length **50.0m** Vertical Range **(10m) +5m /-5m**

LAPLONG KHUN

CAVE	<i>Laplong Khun</i>		<i>[Jamir 2014 and 2017: Cave 5]</i>			
LENGTH	<i>70m</i>	VERTICAL RANGE	<i>23m (-0m / +23m)</i>			
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Roman Hapka 26/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°41'03.3"</i>	<i>094°54'00.0 "</i>	<i>1100m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is situated between Betang and Khongha, near the bottom of the Wawade Waterfall. From Betang drive down towards Khonga until reaching a concrete bridge across a stream. Walk up a trail on the right side of the road (50 m before the bridge) and follow it upstream. Cross a first small stream and when the path gets really steep after 5 minutes of walk follow the trail going right until it reaches the river at the entrance of the canyon. Cross the river and follow it for 100 m. The wide-open entrance of the cave is visible on the right, 15 m above the river. Wawade Waterfall (more than 50 m high) is easy to reach from there after another 5 minutes-walk and scramble along the riverbed.

Description

Relic cave along a cross rift in crystalline Limestone of the Mimi formation.

The large entrance (7 m by 10 m) is facing north east. The 70 m long cave is leading upwards at an angle of ca. 30°. After 20 m the cave splits into a lower and an upper passage, forming an oxbow. The lower passage is littered with breakdown boulders. The upper passage, with some stalactites in the roof can be reached via a squeeze and an easy 4 m climb at the end of the lower passage.

Particular Details

Cultural Relevance: There are two small hand-built terraces at the entrance. According to guide Jiwong from Mimi it was constructed by his grandfather. The cave is mentioned as "Cave 6" by Tiatoshi Jamir and others 2014 and in: Recent Archaeological Investigation around the Naga Metamorphic and Ophiolite Belt of the Indo-Myanmar Border, by Tiatoshi Jamir, David Tresto and Zokho Venuh, 2017

LAPLONG KHUN

Kiphire District / Nagaland State - INDIA

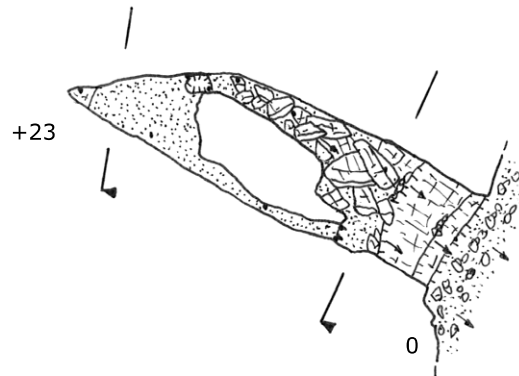
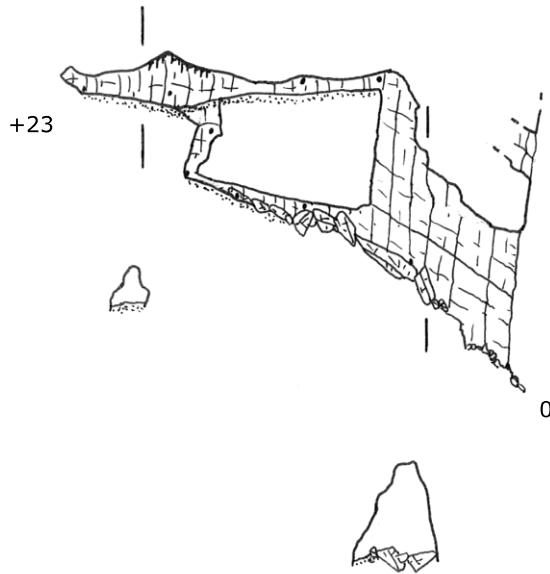
MIMI NG-46/12 Mimi

26/12/2022 R.Hapka, A.Singh, O.Legg

Length **70.0m** Vertical Range **(23m) +23m /-0m**

0 5 10 15 20 25 m

Scale 1 : 500



3. VALLEY -LEVEL CAVES

Longkhünkhong Khün, Zohlap Khun 1, Zohlap Khun 2, Cave 192, Deprak Long Khun, Lapkhin Khun, Raneak Khun, Longtithrün Khün

[Expedition Diary] ... “As it becomes evident, that the many caves situated at around 1200 m asl are mostly short, blocked vertical pitches, the exploration of the resurgence caves at valley level becomes more and more important.

Longthiyang Khün, Longkhen Khün and the more distant two Zholap caves are the most promising of them. Deprak Long Khün has been started on the first day and left rigged over Christmas, whereas nearby Lap Khin Khun and the more distant Zholap Khun 1 and 2 are still untouched. The later, situated at quite a distance upstream from Lap Khin Khun, are requiring a satellite camp.”

LONGKHÜNKHONG KHÜN

CAVE	Longkhünkhong Khün					[Tsie Khun]	
LENGTH	50m	VERTICAL RANGE					10m (-5.0m / +5.0m)
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by David Cooke 30/12/2022							
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location	
25°42'40.8"	094°55'47.5 "	1300m	+/- 20m	WGS 84	NG46-12	Mimi	

Location

The cave is situated North-Est of Mimi, below the old, long and difficult road to Salomi. To reach the cave from Mimi take the ancient road leading to Salomi (and also to the next village visible from Mimi direction East). After going down for half an hour, take a left-hand footpath and walk down for 20 min following a ridge. Pass Wüezietsü Khong 1 and follow the path down 15 minutes, then scramble downslope on a small dry valley. From the right side of the valley follow the difficult path down a cliff face to a very large fig tree. A guide is needed to find the cave.

Description

Small sub-horizontal relic cave, former spring.

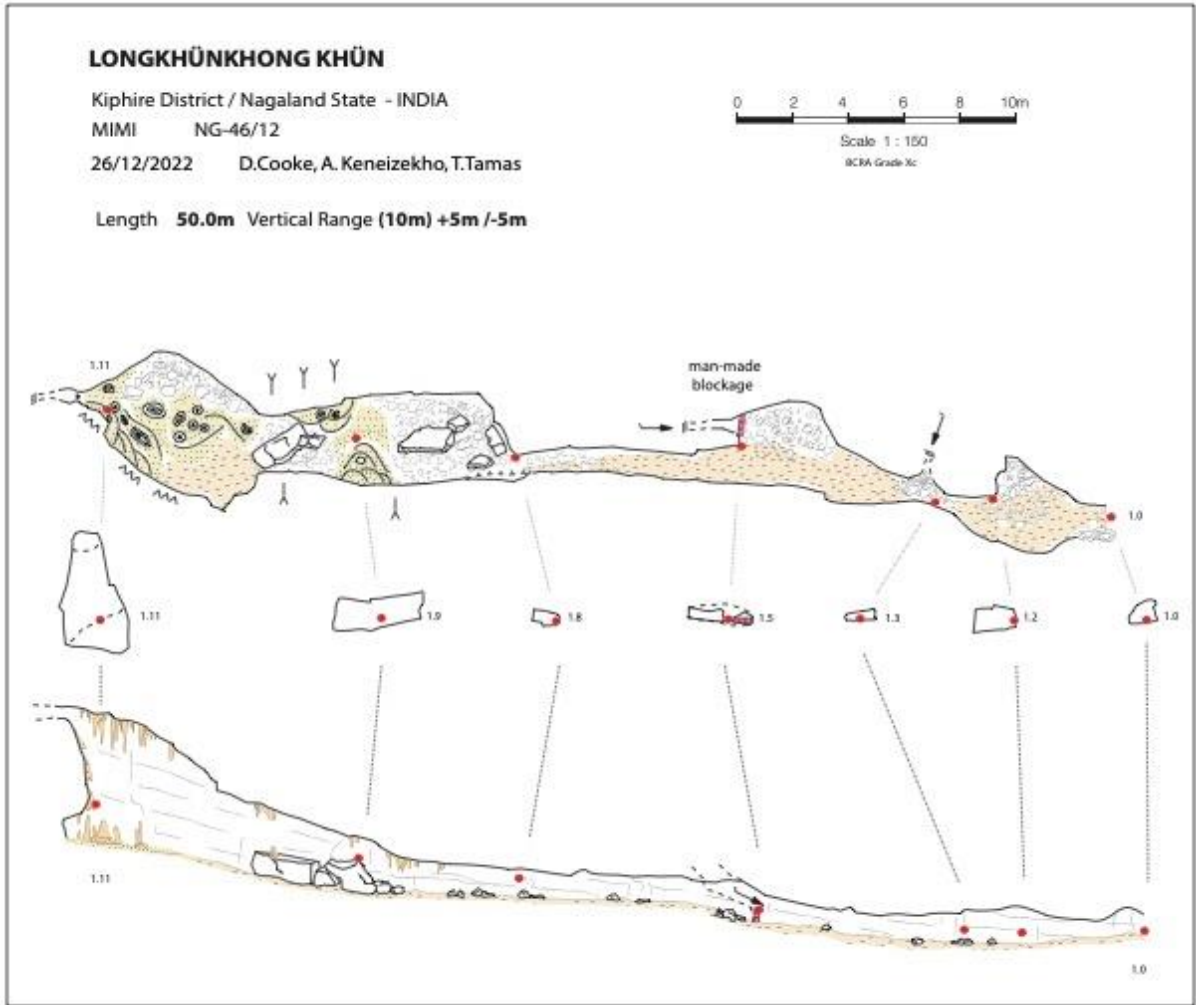
The cave has a rectangular (1 m by 0.5 m) entrance and is mainly a straight, SSW-oriented passage of 25 m length with two squeezes, of which the first one had to be enlarged. Several spots in the first 10 m have lateral leads blocked with boulders by the villagers for hunting purposes. The second squeeze is following a small rift after which the passage reaches dimensions of 2 m by 2 m. There are some breakdown boulders in this section. The cave ends in a little chamber, nicely decorated with abundant calcite formations (stalactites, flowstone, popcorn).

Particular Details

Cultural Relevance: *The cave is a bat hunting place.*

Deposits: *Bat guano and phosphate crusts.*

Restrictions: *Visit only with guide*



ZHOLAP KHUN 1

CAVE	<i>Zohlap Khun 1</i>					
LENGTH	<i>152m</i>	VERTICAL RANGE <i>11m (-0m / +11m)</i>				
<i>G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Ayush Singh 10/10/2020</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°43'34.1"</i>	<i>094°54'57.0 "</i>	<i>1000m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is situated North-Est of Mimi, 2-2 ½ hrs walk downhill from the village and close to river. It is reached by descending North from Mimi village past the old church site and through the cemetery. Two track junctions are passed turning left at each (GPX file required) before an

indistinct hunters' trail descends steeply to the river. Cross the river and turn left on the true right bank of the river. The entrance is reached after about 10 minutes' walk, after passing the obvious entrances of Cave 192 and the Shaft of Zholap Khun 2.

Description

Horizontal relic cave, former resurgence.

The dry, arched entrance is 14 m wide by 4 m high situated about 30 m above river level. The entrance is a large alcove with a dry, sandy floor and some boulders, a perfect resting and camping spot for the hunters.

The large entrance quickly narrows to a walking size passage with a flowstone alcove to the left. Here a small roof tube loops over the passage and enters the entrance chamber on the right. After a small step up (1 m) the passage becomes crawling size for 5 m before a widening chamber is reached and an obvious junction to the left. To the left a stooping height passage can be followed for approx. 30 m before it narrows to a finish in a too tight passage.

Back at the junction the main route enlarges to walking size and enters an area of blocky breakdown after 40 m where water can be heard flowing under the floor. Beyond this point the passage becomes sand/gravel floored and ends after a further 20 m.

Particular Details

Cultural Relevance: *The cave is a bat hunting place.*



Bear Skull in Zholap Khun 2

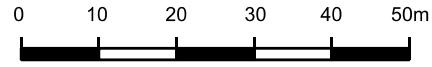
Photo by Kitboklang Wann, 2023

ZHOLAP KHUN 1

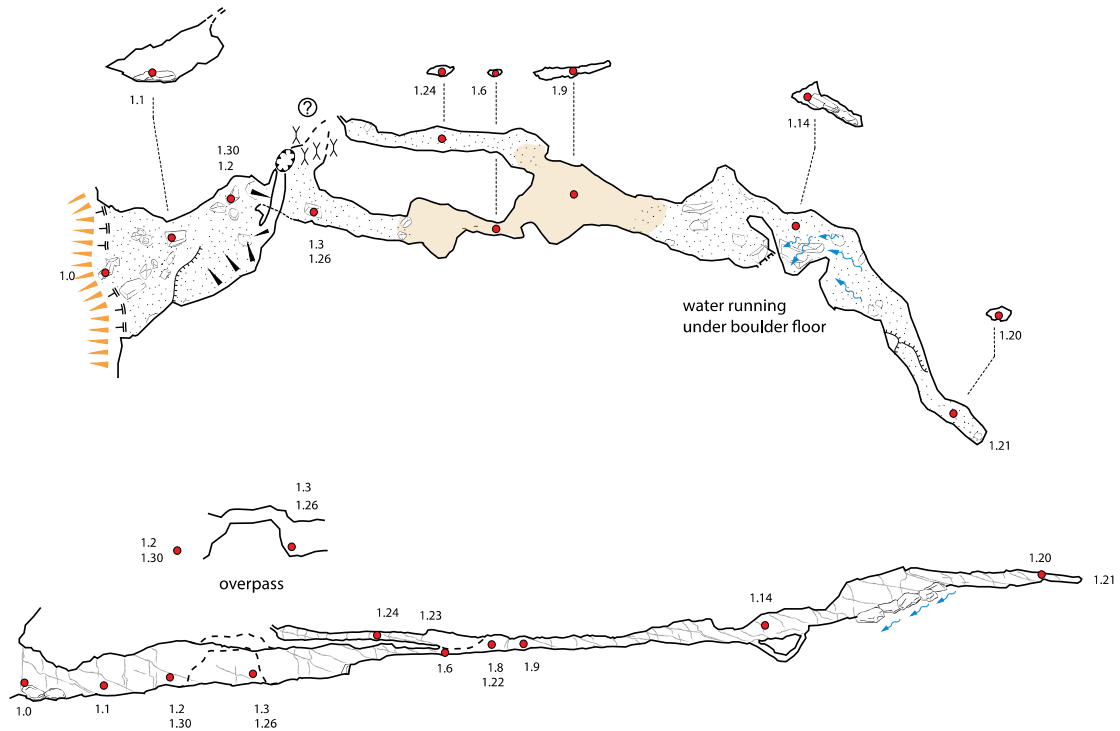
Kiphire District / Nagaland State - INDIA
 MIMI NG-46/12 Lapkhin

02/01/2023 Richard Hudson, Oliver Legg, Rovi Meyase

Length **152m** Vertical Range **(11m) +11m /-0m**



Scale 1:750



ZHOLAP KHUN 2

CAVE	Zohlap Khun 2		[Zholap Khun Top]			
LENGTH	205m	VERTICAL RANGE	25m (-25m / +0m)			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by Oliver Legg 29/12/2022						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°43'05.0"	094°54'05.5 "	1000m	+/- 12m	WGS 84	NG46-12	Mimi

Location

The cave is situated North-Est of Mimi, 2-2 ½ hrs walk downhill from the village and close to river. It is reached by descending North from Mimi village past the old church site and through the cemetery. Two track junctions are passed turning left at each (GPX file required) before an indistinct hunters' trail descends steeply to the river. Cross the river and turn left on the true right bank of the river. The entrance is reached after about 10 minutes' walk, after passing the obvious entrances of Cave 192.

Description

relic cave, with funnel-shaped entrance shaft and several horizontal levels. Possibly a former resurgence.

The dry, arched entrance is 14 m wide by 4 m high situated about 30 m above river level. The entrance is a large alcove with a dry, sandy floor and some boulders, a perfect resting and camping spot for the hunters.

The entrance pitch requires an abseil of 16 m passing a narrowing (2 m x 1 m) 6 m below the lip. The landing is on a slope of sandy debris and a short distance to the right is a short loose climb down into the lower entrance chamber. Turning left from the landing point there is a 5 m x 8 m chamber with a route out to the left and a series of sandy joint controlled crawls that all interconnect and lead to the lower entrance chamber in the vicinity of the short loose climb. Following the higher of these sandy routes a chamber is reached with a large number of tree roots.

From the lower entrance chamber a steep and loose slope consisting of gravel and leaf debris passes under a roof lowering before ending at a level floor after 25 m. Turning right here a stooping triangular shaped passage is passed before easier walking and a widening after a further 30 m.

At this point the passage lowers to hands and knees crawling and a junction where a right turn enters a 5 m x 8 m chamber with two small impassable routes heading off. Continuing straight on, the passage turns sharply right, slopes uphill with the left wall comprising fractured blocks. A cold draught emerges here, but all routes are too tight to follow.

Particular Details

Cultural Relevance: The cave is a bat hunting place.

Tackle: 1 x 20 m rope, 3 x 1.2 m sling

Bio-Speleology: Old bear skull found. Details see: Bio-Speleological Report.



Abseiling in Zholap Khun 2

Photo by Pynshai Syiemiong, 2023

ZHOLAP KHUN 2

Kiphire District / Nagaland State - INDIA

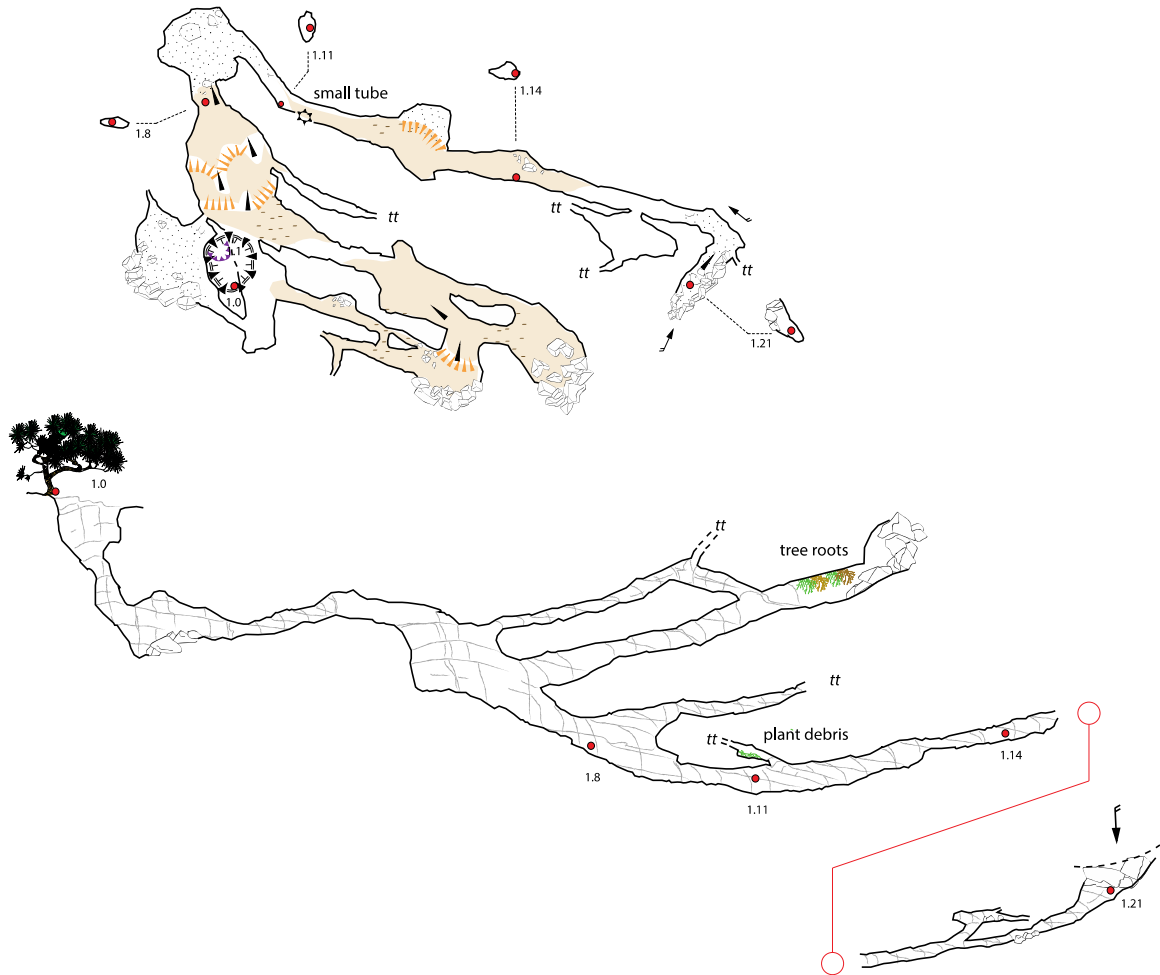
MIMI NG-46/12 Lapkhin

02/01/2023 Richard Hudson, Oliver Legg, Rovi Meyase

Length **205m** Vertical Range **(25m) +0m /-25m**



Scale 1:750



ZHOLAP ROCK SHELTER

CAVE <i>Zholap Rock Shelter</i>		<i>[Cave 192]</i>				
LENGTH <i>17m</i>	VERTICAL RANGE <i>3m (-3m / +0m)</i>					
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Ayush Singh 10/10/2020</i>						
Northing <i>25°43'05.0"</i>	Easting <i>094°54'57.0 "</i>	Altitude <i>1000m</i>	Prec. error <i>+/- 20m</i>	Geodetic Datum <i>WGS 84</i>	Map Square <i>NG46-12</i>	Location <i>Mimi</i>

Location

The cave is situated North-East of Mimi, 2-2 ½ hrs walk downhill from the village and close to river. It is reached by descending North from Mimi village past the old church site and through the cemetery. Two track junctions are passed turning left at each (GPX file required) before an indistinct hunters' trail descends steeply to the river. Cross the river and turn left on the true right bank of the river. The entrance is reached after about 10 minutes' walk.

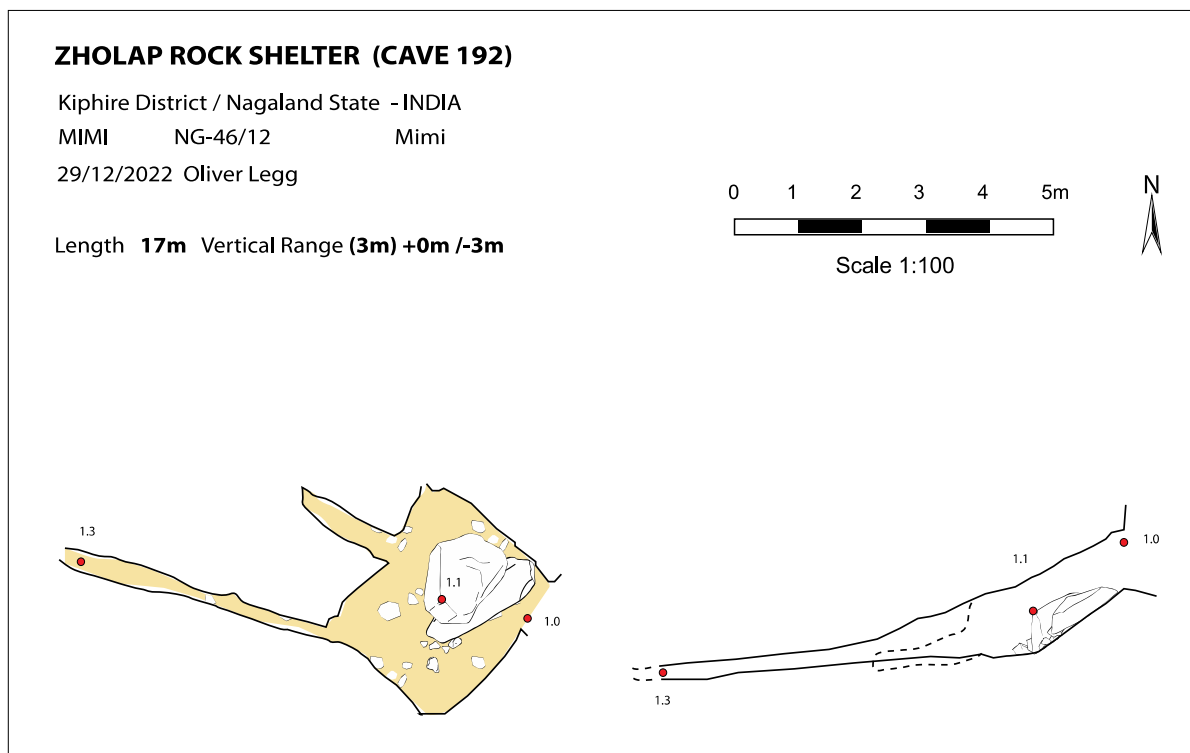
Description

Relic cave, rock shelter in crystalline Limestone of the Mimi formation

The arched, 1.8 m by 1.8 m entrance gives access to a single squarish chamber about 5 m by 5 m in size and 1.8 m high, getting lower towards north west. A large rock slab is sheltering-off the entrance. In the wall opposite the entrance (north west) there are two narrow passages following joints – 5 m and 2 m long and too tight and too low to be followed-up.

Particular Details

Cultural Relevance: The cave is a rest- and camp site for the local hunters.



DEPRAK LONG KHUN

CAVE <i>Deprak Long Khun</i> [Longthyang Khun, Longthingyang Khun]						
LENGTH <i>194m</i>			VERTICAL RANGE <i>42m (-39m / +3m)</i>			
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Oliver Legg 21/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
<i>25°43'11.9"</i>	<i>094°54'21.6 "</i>	<i>843m</i>	<i>+/- 20m</i>	<i>WGS 84</i>	<i>NG46-12</i>	<i>Mimi</i>

Location

The cave is situated about 1.2 km north of and 800 m below Mimi, 150 m above Lapkhin River.

Take the road from Mimi, leaving the road (46 R N 689684/E 2844312) onto a smaller track. Park the vehicle (46 R N 690261/ E 2845116) and continue on foot. The track is well developed and descends shallowly at this point. Cross an intersection with the path to Pungro (46 R N 690623/E 2845309). The path continues to descend, increasing in steepness and narrowing. Before reaching the river take a right turn (46 R N 690732/E 2845722) descending for a short distance before climbing up to reach the obvious large entrance.

Description

Vertical cave in boulders

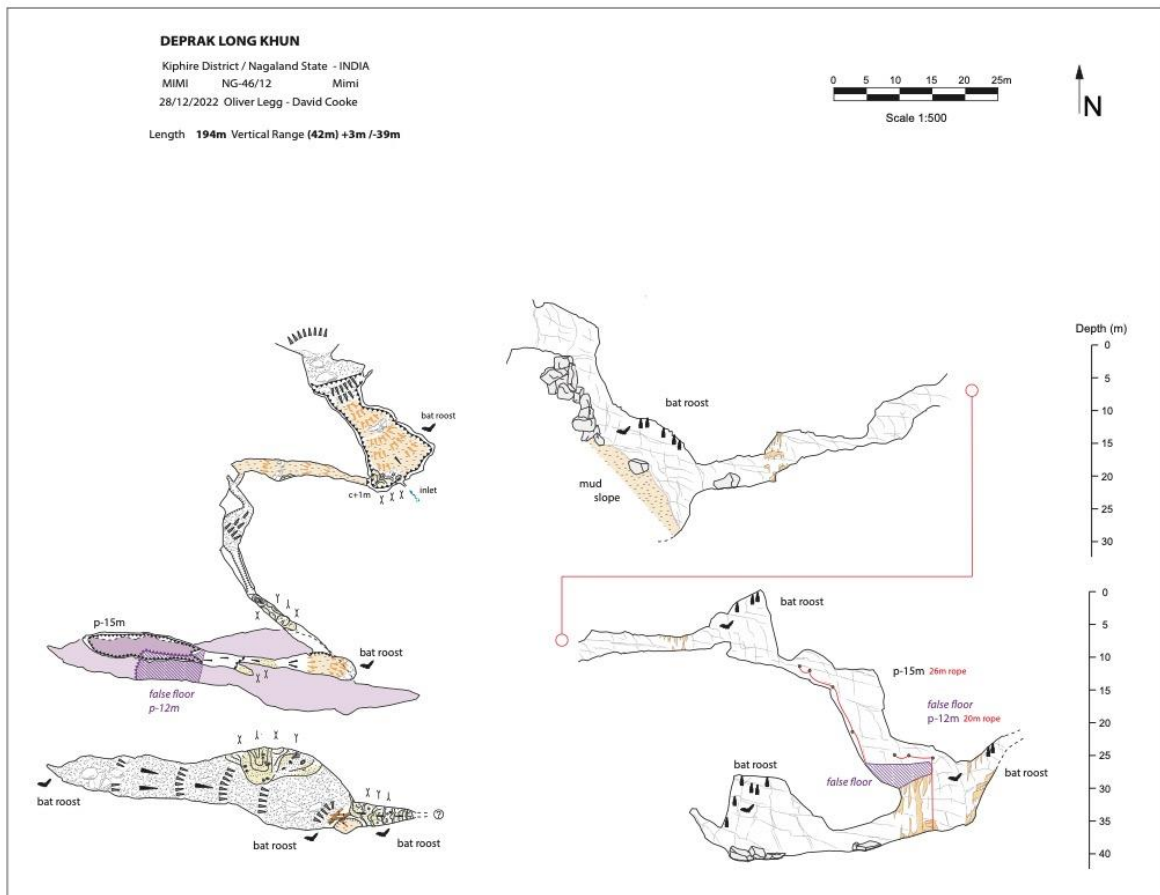
The Entrance is a large scoop, with the roof (and subsequent pitch wall) formed from 'cemented'-in boulders. The first pitch, permanently rigged with a thick rope & ladder by the locals. Descending down the pitch leads to a chamber, with bats roosting on the ceiling, and a sloping guano floor. A smaller passage is dog-legging off and leading upwards and after a short, small squeeze it opens up. Continuing up a greasy slope and round the corner one emerges at a T-junction with a large chamber stretching to left and right. A short climb down, gains the floor, and both left & right are ending in pitches. The next two pitches down (26 m & 18 m) are leading to a large chamber beneath with another bat roost. This seems to connect to the leftwards descent, although this is not confirmed on the survey.

Particular Details

Cultural Relevance: *The cave is a bat harvesting site.*

Bio Speleology: *Very rich biota due to the bats and guano deposits. Details see: Bio-Speleological Report.*

Tackle: *Two 50 m ropes, 5 hangers.*



LAP KHIN KHUN

CAVE	<i>Lap Khin Khun</i>	<i>[Longkhen Khun, Bat Cave 2]</i>				
LENGTH	121m	VERTICAL RANGE 34m (-0m / +34m)				
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Oliver Legg 24/12/2022</i>						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°43'11.9"	094°54'21.6 "	900m	+/- 40m	WGS 84	NG46-12	Mimi

Location

The cave is situated about 1.2 km north of and 800 m below Mimi, 150 m above Lapkhin River.

Take the road from Mimi, leaving the road (46 R N 689684/E 2844312) onto a smaller track. Park the vehicle (46 R N 690261/ E 2845116) and continue on foot. The track is well developed and descends shallowly at this point. Cross an intersection with the path to Pungro (46 R N 690623/E 2845309). The path continues to descend, increasing in steepness and narrowing. Before reaching the river take a right turn (46 R N 690732/E 2845722) descending for a short distance before climbing up to reach the obvious large entrance. From there continue for another 50 m up-hill to reach the 3 entrances of Laphkin Khun.

Description

Cave in boulders

The cave sits on the slope with three entrances/opening (2 of which are blind) lying parallel to each other. The main entrance has a low entrance which requires stooping in order to enter the cave. The second and third entrance were just alcoves. The main entrance is a small opening leading into a bigger passage with a climb for a few meters and a passage on the left just on top of the first slope. From there we can see the bat chamber and on the other side lies another slippery slope descending for a few meters, heavily covered with bat guano. From the first Bat chamber a ladder leads to another bat chamber, which was visited but not surveyed.

Particular Details

Cultural Relevance: *The cave is a bat harvesting site. The entrance is fenced-off with bamboo spikes to keep unwanted visitors away.*

Bio Speleology: *The place was very humid and has a strong smell of bat guano. The floor of the cave was "alive" with hundreds of millipedes. Details see: Bio-Speleological Report.*

Tackle: *10 m Ladder (in place).*



Lapkhin Khun, Entrance, fenced-off with bamboo spikes

photo by Tudor Tamas, 2023

LAP KHIN KHUN

Kiphire District / Nagaland State - INDIA

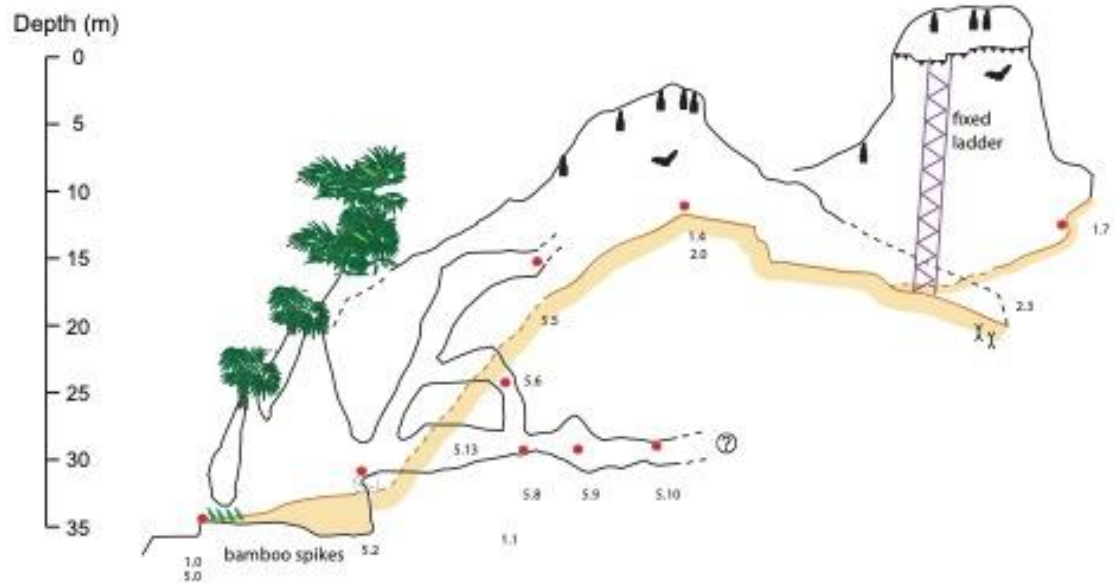
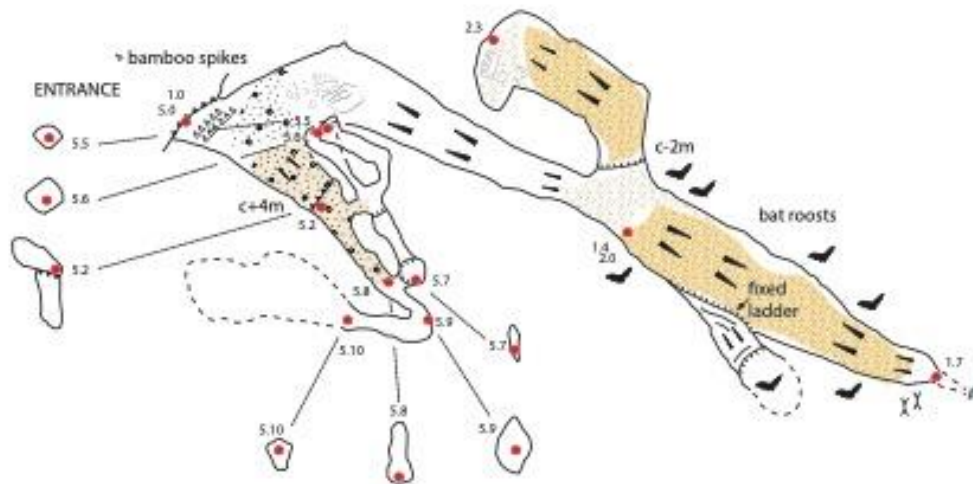
MIMI NG-46/12 Mimi

24/12/2022 D.Cooke, R.Wahlang, P.Syiemiiong

Length **121m** Vertical Range (**34m**) **+34m / -0m**



Scale 1:500



RANEAK KHUN

CAVE	<i>Raneak Khun</i>	<i>[Ranyak Khen]</i>
LENGTH	120m	VERTICAL RANGE 9m (-6m / +3m)

G.P.S. POSITION/CO-ORDINATES/ALTITUDE Thomas Arbenz 24/12/2022						
Northing	Easting	Altitude	Prec. error	Geodetic Datum	Map Square	Location
25°43'16.6"	094°54'20.6 "	990m	+/- 12m	WGS 84	NG46-12	Lap Khin

Location

The cave is situated 1.2 km North of Mimi Village, on the south facing bank of Lap Khin (= Bat River), 50 m above river level.

From Mimi take the road to Pungro down to a junction at 25°42'31.2"/94°53'38.4, marked with a sign : "Natural Cave Road...". Follow the track (4x4 vehicle required) to a clearing at 25°42'42.0"/ 94°53'47.4 which allows turning and parking of the vehicle. The track goes on for about 200 m ending near a ravine. The continuation from there is on narrow jungle paths. First the path traverses the steep slope for 200 m to reach a first X-junction. Head across and downhill, the path is gradually getting steeper. By reaching a T-Junction at 25°43'11.5"/94°54'16.8"/ 860 m you take a left down to the Lap Khin River along an even steeper path. Cross the river to the south bank on logs and rocks (slippery!) and an inlet on a tree trunk (adventurous) then head north and scramble up a very steep slope (use lianas and roots for holds) to reach the cave entrance about 50 m above river level.

Description

Relic resurgence cave and rock shelter.

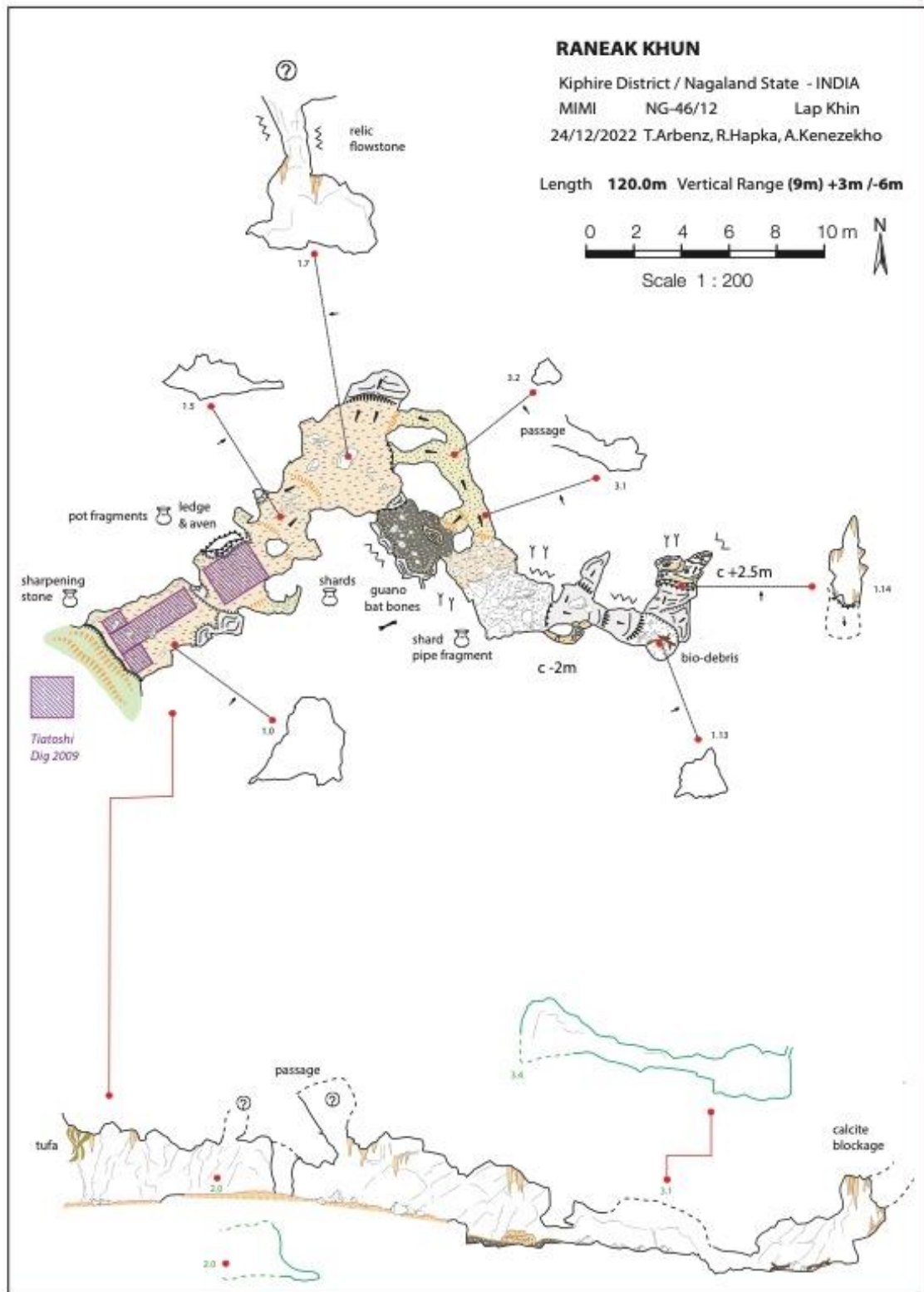
The entrance is 6 m wide by 7.5 m high and the cave is sectioned into 6 chambers, connected by open porches and looping-back side passages: 1) Entrance Chamber, 2) Main Chamber, 3) Stairway, 4) Guano Chamber, 5) Alcove. The walls are covered with abundant pencil- and charcoal graffiti, indicating that the cave is frequently visited, it is Mimi's "Tourist Cave". Some pot and pipe fragments were observed. Bat Bones and "live" guano indicate that the Guano Chamber is home to a bat roost (none present at time of visit).

- 1) Entrance Chamber. 6 m wide x 8 m high, 23 m long. Compressed soil floor with a few rocks scattered around. 3 different simple fire places. The entrance chamber is dry with an even ground still used by hunters as an overnight camp. The archaeological dig by T.Jamir (2007) was done in two squares in the entrance chamber (see map).
- 2) Main Chamber. Reached through a twin porch separated by a rock pillar and down a short slope into the circular chamber of 14 m diameter and 8 m height. Mud and sand floor with some bat guano and a few solitary rocks. Relic calcite formations high up on walls and roof. One possible continuation into a high-level passage would require a 10 m maypole and ladder.
- 3) Stairway. On the eastern side of the main chamber there are 3 natural steps leading down 3 m to the Guano Chamber. The passage is 3 m wide and 2.5 m high, the steps are following the broken, "standing" layer of limestone, which forms a natural rim on the western side of the Guano Chamber. The rock is a bit flaky and there are some relic formations on both sides of the passage.
- 4) Guano Chamber. 8 m wide and 7 m high. A solitary boulder and a large, relic stalagmite boss. Relic formations on the walls, mainly flowstone. The features and the floor are covered with relatively fresh guano. On the northern side of the chamber an up-sloping relic phreatic tube with dry mud floor leads up and back into the Main Chamber.
- 5) Alcove. Accessed via a low passage with a relic calcite floor, forming a slippery toboggan 2 m down into the Alcove. Towards north there is a 2.5 m high ledge, with abundant calcite formations, mostly active stalactites and curtains. The calcite is the far corner, however, there was no airflow observed – continuation is unlikely.

Particular Details

Cultural Relevance: Archaeological site. Details see: Archaeological report.

Tackle: 50 m ropes as handline in the steep terrain from the river up to the cave entrance.



LONGTITHRÜN KHÜN

CAVE <i>Longtithrün Khün</i>		<i>[Longdetrang Khun, Long Thetren 2]</i>				
LENGTH <i>10m</i>	VERTICAL RANGE <i>8m (-8m / +0m)</i>					
G.P.S. POSITION/CO-ORDINATES/ALTITUDE by <i>Ayush Singh 03/01/2023</i>						
Northing <i>25°43'03.9"</i>	Easting <i>094°54'21.3 "</i>	Altitude <i>1078m</i>	Prec. error <i>+/- 10m</i>	Geodetic Datum <i>WGS 84</i>	Map Square <i>NG46-12</i>	Location <i>Mimi</i>

Location

The cave is situated on Limsangwo's land, north of the village, ca. 200 m below Thsuru the old settlement. From Mimi, follow one of the tracks towards Mimi old village (Thsuru) and from the village gates follow a very steep path downslope north towards Limsangwo's land. At about 1200 m altitude leave the path and scramble down on a steep slope, then traverse west through Limsangwo's land, to a marble outcrop oriented along the slope (SE-NW); descend 20 m until the outcrop turns south west. Just below the corner of the cliff (4-5 m) there is a vertical entrance 1 m across.

Description

Short shaft. Dry single pit collecting torrential water running along the cliff face during monsoon only. Former upper part destroyed by erosion (there are small phreatic tubes still visible in the cliff face above)

The Entrance is Almost circular (clam-like), about 1 m in diameter, facing north east. The cave is a single 8 m pit with a couple of steps on flowstone, along a joint NW-SE. A small aven filled with calcite speleothems at -3.2 m points to a joint parallel with the main passage: both joints are largely parallel to the cliff face above.

Particular Details

Formations: *Very abundant calcite decorations on the walls and ceiling: stalactites, flowstones, curtains (bacon) one of which is translucent; several speleothems consisting of large (>1 cm) calcite crystals; Bottom filled with breakdown and the logical continuation downward SE along the initial fissure is filled with calcite speleothems.*

Tackle: *15 m rope*

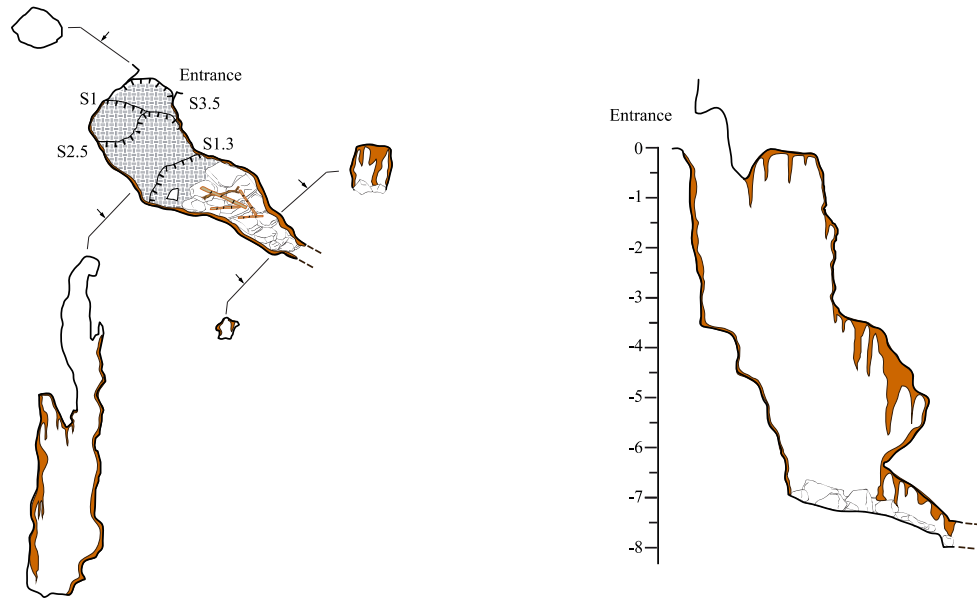
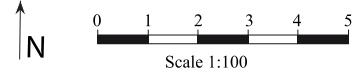
Longithrün

Kiphire District / Nagaland State - INDIA

MIMI

3/1/2023 Survey: T.Tāmaş, A.Singh, A. Keneizekho

Length 10 m; Vertical range (8m) -8m



APPENDIX

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