

**CHINESE-BULGARIAN-GREEK  
SPELEOLOGICAL EXPEDITION  
“Gaolingongshan 2011”  
IN YUNNAN PROVINCE, CHINA**



**Expedition Report**



**Sofia, Bulgaria**

**2012**

# Gaolingongshan 2012 Expedition Report

Edited by Alexey Zhalov

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## Abstract

This report details the joint Chinese-Bulgarian-Greek expedition carried out by members of Bulgarian Federation of Speleology and Yunnan Institute of Geographpy & China Exploration & Research Society (CERS ) Yunnan branch, Yunnan Province, China.

Yunnan 2012 was a 4-week, 13 person winter caving expedition. This expedition involved a first speleological exploration of the caves of Gaolingongshan and to known some unexplored areas on the mountain. Major finds included the logging and exploration of 8 new caves on the territory of the mountain and its vicinity. The most significant caves which the team explored were far from the main exploration area close to Kunming city. Among them are the longest caves explored during the expedition Yenze Dong (Swallow cave) – 1514 m and Da Shi Dong (Big rock cave) - 1394 m. During the expedition were mapped 11 caves with a total length of the galleries 4972 m and depth 429.60 m (-318.2/+ 89.4)

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## **Summary**

### ***Aims***

#### **Primary aim**

To explore the caves pointed from the Baoshan Administrative Bureau of the National Nature Reserve on the territory of the reserve and Baoshan County, Yunnan Province, China.

#### **Objectives**

To explore and survey all caves and to study from zoological point of view.

#### **Secondary objectives**

1. To assist the Yunnan Institute of Geography & China Exploration & Research Society, by exploring the caves in the province.

2. To continue the development of cooperation between Bulgarian Federation of Speleology and Yunnan Institute of Geography on the field of speleology.

#### ***The expedition area***

##### **General**

Yunnan province is located in southwest China. It shares borders with Vietnam (to the South), Burma (to the West), Tibet and Sichuan (to the North), and Guizhou and Guangxi (to the East). The expedition's main focus was in the West of the province in the west of the Nu Jiang (Salween) river.

This expedition focused on the mountain range of the Gaoligong Mountains (simplified Chinese: 高黎贡山; pinyin: Gāolí gòngshān) are a mountainous area at the southern end of the Hengduan Mountain Range, located in the western Yunnan highlands very near to the China and Myanmar border. It is located along the west bank of the Nujiang valley from Gongshan town in to Dehong Prefecture. As a part of Hengduan Mountains, Gaoligong Mountain is long and narrow and its terrain is south-to-north, higher in the north and lower in the south, with a relative height difference of more than 2827 meters. The highest peak, Wona, is 3916 m.

##### **Climate**

The mountain lies in the central subtropical zone. The high peaks and deep valleys of the Mountains have created in this mountain area three different climate zones, namely, subtropical, temperate and cold temperate. From the foot of the mountain to its top there are concretely 6 different types namely south subtropical, mid subtropical, north subtropical, warm temperate, mid temperate, and cold temperate zones. The precipitation increases gradually from 736.7 millimeters on the east slope with an elevation of 755 meters, 1763 millimeters on the west slope with an elevation of 1440 meters to 3904.4 millimeters at the top with an elevation of 3210 meters.

The explored caves are situated geographically in the northernmost part at the tropical karst area, but in fact they do not seem to correspond to this type of karst. They are relatively short – up to a couple of hundreds of meters. They lack the big volumes and the abundant presence of speleothems, which are the typical parameters of the tropical karst phenomena. This fact can be explained with the altitude (1000 – 2100 m) – a temperature factor which in combination with the latitude (~ N 25°) takes them out of the zone of active tropical karst genesis. We must not forget that the most favourable temperature for dissolution and redeposition of Ca(Mg)CO<sub>3</sub> is approximately 25° C.

## Brief geology and tectonics of the Gaoligongshan Mountain Range

Western Yunnan is situated in the southeastern part of the Himalayan Mountain Belt close to the Myanmar border (Fig. 1). There are some narrow mountain chains, elongated in N-S direction, which belonged to the SE branch of the Eastern Tethyan Orogen and, therefore, beared significance of the Tethyan Belt in SE Asia. The Himalaya was formed during the collision between the Indian and Eurasian Plates. This collision ensures the transition from a compressional regime in the Himalayas to a right-lateral shear in Myanmar-West China Zone, where a couple of joined smaller continental blocs occurred (Fig. 2). The process is started in the Late Mesozoic and it continues during the Cenozoic till now. The present day deformation occurs throughout the Tibetan Plateau interior by ESE-WNW extension and slightly slower NNE-SSW shortening, which there accommodates much of India's penetration into Eurasia (Figs. 3, 4). Relative to Eurasia, material within the plateau interior moves roughly eastward with speeds that increase toward the east, and then flows southward around the eastern end of the Himalaya (Zhang, et al., 2004). The Gaoligongshan is the westernmost part of this mountain range. It is formed mainly in the eastern part of the Tengchong Continental Block, which is bounded to the East by the Nujiang Fault Line (Figs. 5, 6). However, the western boundary of the block is ambiguous.

The Gaoligongshan Range is about 3000 meters high. It limits the Baoshan area and the Tengchong/Ruili area. The core of the range is composed of low to high grade metamorphic rocks and foliated granites. They are intensely deformed and affected by a subvertical foliation, dipping toward in both, east and west directions, as well as isoclinal ductile folding. Sheet folds and mineral lineation parallel to the range trend indicate severe stretching (Fig. 7). Ductile shear-sense criteria show a right-lateral motion. The mylonitization is dated between 12 and 20 Ma (Zhong et al., 1991; Wang and Burchfiel, 1997). East of the range, Nujiang Detachment Fault separates the metamorphic rocks from the folded Paleozoic sediments of the Baoshan Block. Southernmost ophiolitic rocks are pinched between the metamorphic rocks and the Paleozoic sediments. In the western part of the range, foliated granites are exposed. Neogene deposits overlie them. To the west, the basement, composed of flat foliated granites and metamorphic rocks, is intruded by recent volcanic rocks of the Tengchong Rift (Socqueta and Pubelliera, 2005).

Southward the mylonitic belt disappears near Longling Town. A large batholith intrudes the metamorphic range, which seems to curve to the southwest. An earthquake swarm occurred in 1976 (MZ 5.29–7.1), which have been interpreted to be related to left-lateral movement along NE trending faults (Holt et al., 1991), indicate that this segment of the fault zone is still active.

In the present position, the Tengchong Block and its eastern neighbor - the Baoshan Block are separated by the Nujiang Fault (Fig. 6). The basement of two blocks is largely covered by medium-grade to low-grade metamorphic Paleozoic to Early Mesozoic sedimentary rocks. The strata were strongly folded. These rocks are intruded by numerous granitoids mainly Mesozoic to Cenozoic in age. Active faults are distributed allover the area.

Sedimentary rocks of the Tengchong Block occurred in a roughly N-S zone in the center of the block. They are more or less metamorphosed (Fig. 7). The Permo-Carboniferous sequence constitutes most of them. It is composed of the clastic Menghong Group and the overlying carbonate Dadongchang (Yanzipo in southernmost Tengchong) Formation (Fig. 8).

The Menghong Group starts with 600-700 m of shallow marine deposits: monotonous mudstones, siltstones and sandstones. The contact with older sequences is either faulted or covered by Cenozoic deposits. In the middle part of the group, there is a succession of 700-900 m of coarse sediments, comprising dominantly diamictites and pebbly mudstones. Slumps and dewatering structures, sand pillows, wavy bedding in fine intercalations are seen in this portion. Large clasts of the diamictites and pebbly mudstones are composed of a variety of rock types. The most common of them are quartz, granite, metamorphic rocks, cherts, sandstone, siltstone and mudstone. The upper part of the Menghong Group is composed of 200-400 m of dark to

black shales and siltstones with some irregular argillaceous and limestone beds. This part of the section contains bryozoans, crinoids, brachiopods and bivalves - the typical fossil association of Permo-Carboniferous periglacial marine deposits (Xiao, 2002).

Limestones, dolomitic limestones and marbles of the Dadongchang Formation, or of the similar Yanzipo Formation in southernmost parts of Tengchong Block overlie the Menghong Group. The thickness of carbonate strata is about 400 m. The lower part consists basically of bioclastic limestones, and the middle and upper parts - more dolomitic limestones and some chert nodules and bands. The fossil fauna guides to suppose the age of carbonates to be Late Carboniferous to Early Permian, or more precisely Asselian (?) to Wuchiapingian (Geological Survey of Yunnan, 1986). The top part of the Permian is unknown. In the northern part of Tengchong Block, on the western flank of the Gaoligongshan Range, there are some dolomitic and argillaceous limestones that have been mapped as the Middle Triassic. Probably these carbonates also contain Lower Triassic strata (Xiao, 2002).

Upper Paleozoic glaciomarine deposits combined with the presence of cold-water faunas and *Glossopteris* indicate a Gondwana provenance of the Tengchong and Baoshan Blocks in Western Yunnan. These two terrains separated from Gondwana in the late Early Permian. Docking commenced in the Late Triassic concomitant with the closure of the Changning-Menglian Belt (Figs. 5, 6). Lateral displacements in the course of the Himalayan Orogeny moved the Tengchong Block to north, bringing it into juxtaposition with the western margin of the Baoshan Block. This tectonic contact is now the Nujiang Line (Wopfner, 1996).



Fig. 1. Geographical settings. The observed area is shown with a red rectangle.

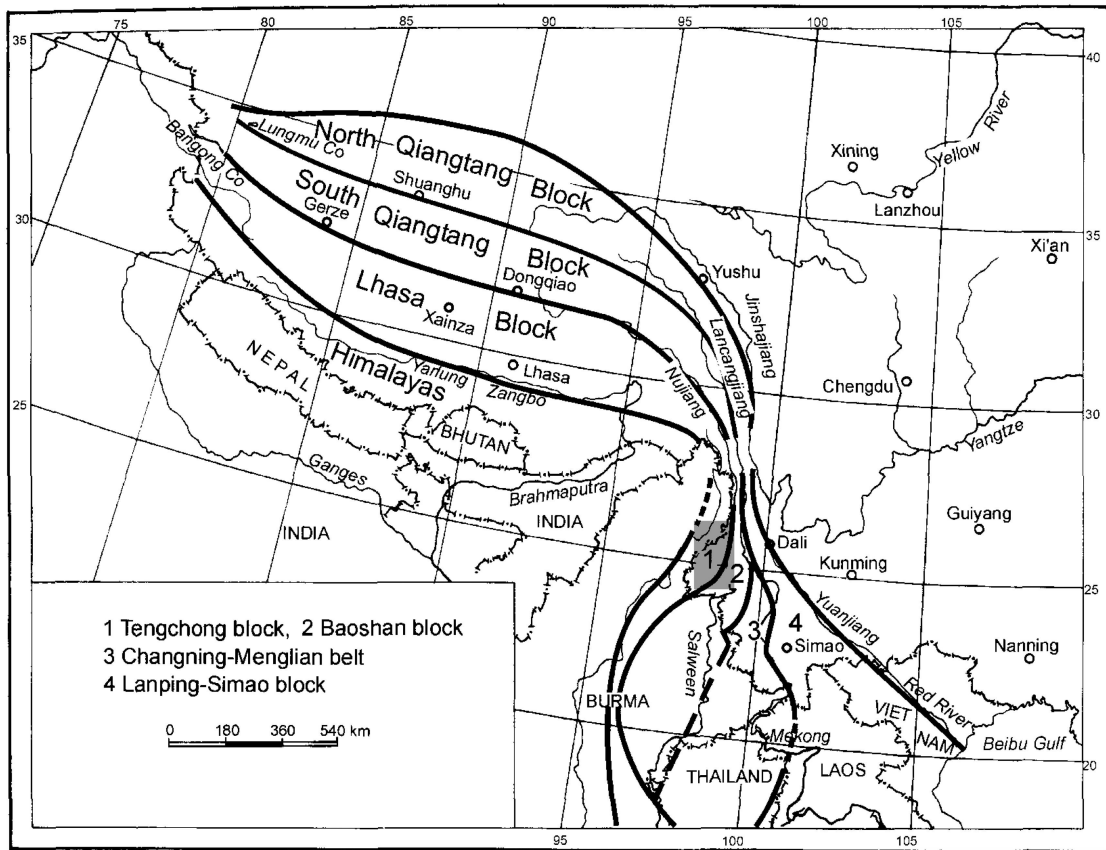


Fig. 2. Continental blocks and orogenic belts that make up Southwest China (modified from Jin, 1998). The observed area is shown with a darkened rectangle.

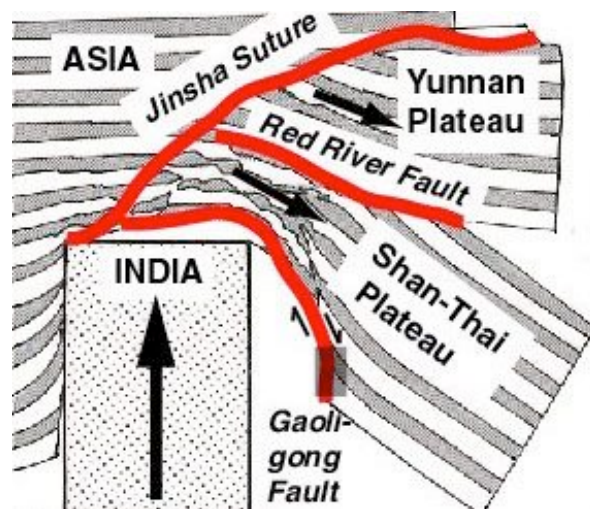
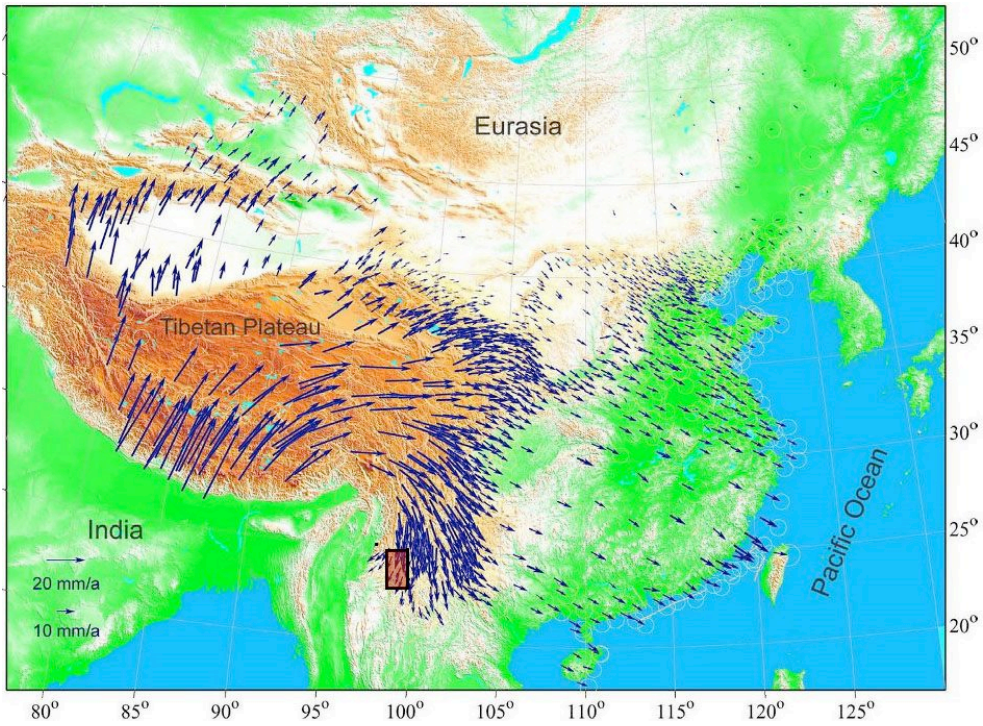
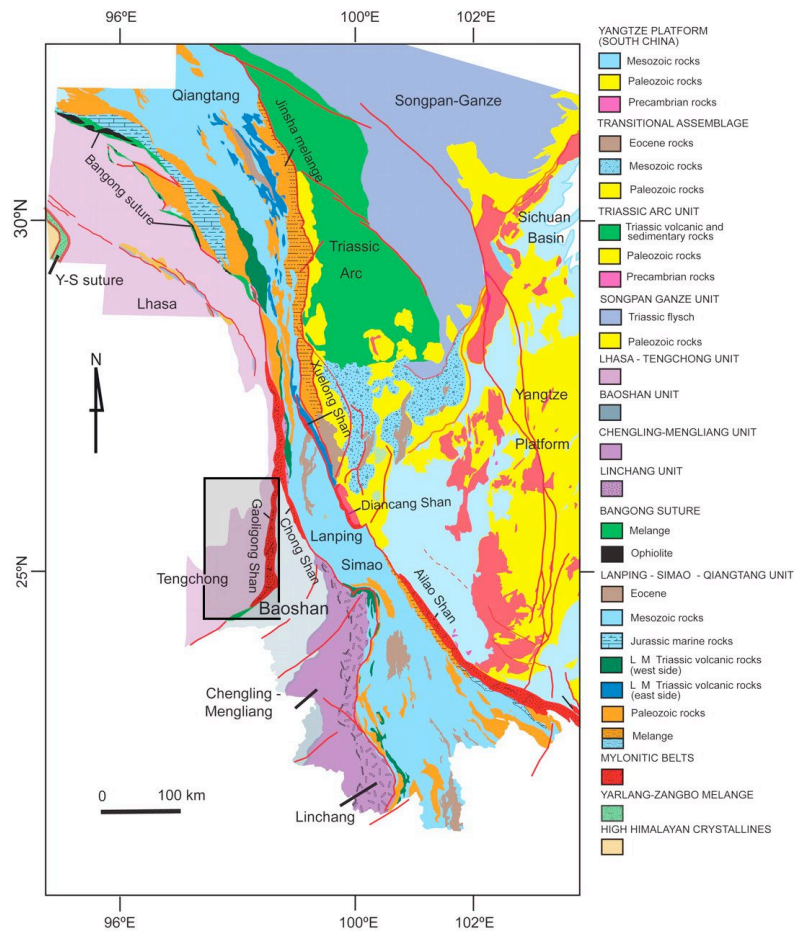


Fig. 3. Sketch showing the mechanism of tectonic deformation in SE Asia (modified from Ching et al., 2007). The observed area is shown with a darkened rectangle.



**Fig. 4.** A present day global positioning system (GPS) velocities (mm/yr) in and around Tibetan Plateau with respect to stable Eurasia, plotted on shaded relief map (modified from Zhang et al., 2004). The observed area is shown with a red rectangle.



**Fig. 5.** Tectonic map of the Western Yunnan area (Akciz et al., 2008). The observed area is shown with a darkened rectangle.

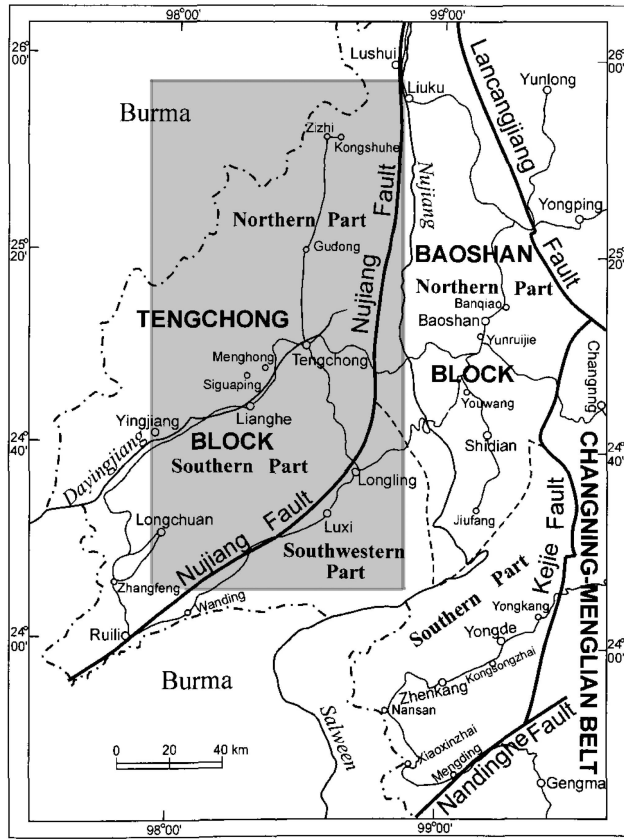


Fig. 6. Composite map of the Tengchong and Baoshan blocks (Xiaochi, 2002). The observed area is shown with a darkened rectangle.

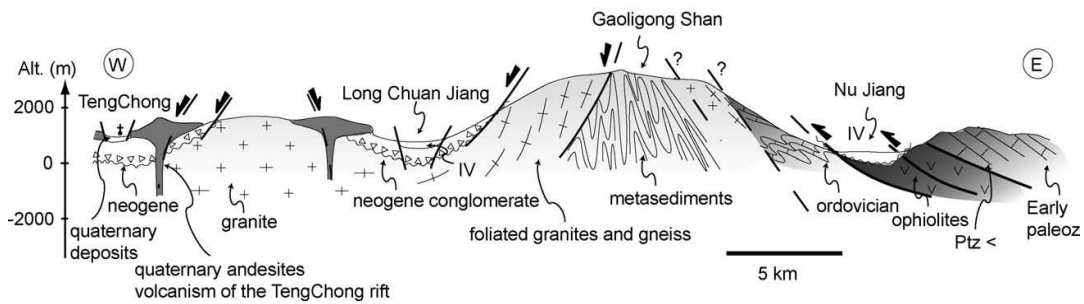
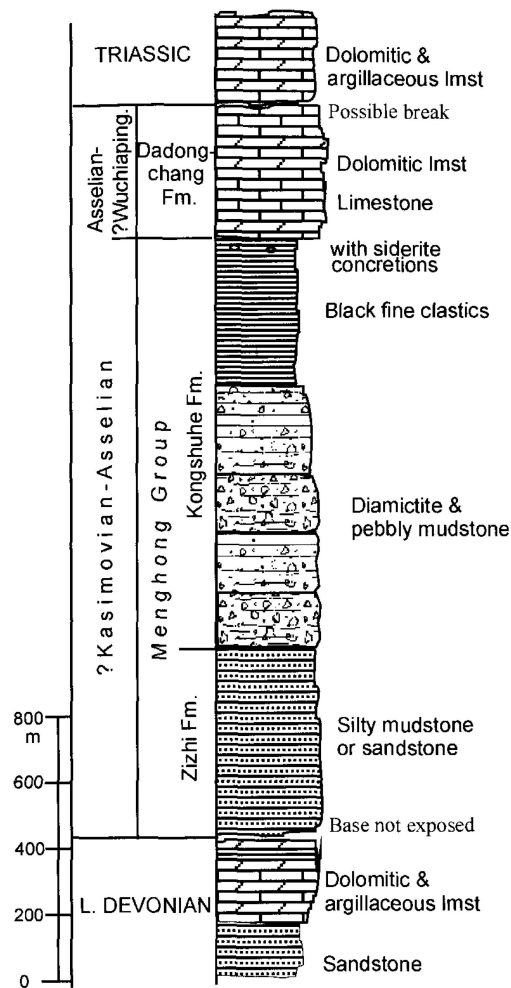


Fig. 7. W-E cross-section of the Gaoligongshan (Socquet and Pubellier, 2005).





**Fig. 8.** Composite stratigraphic column of the Permo-Carboniferous in the Tengchong Block (Xiaochi, 2002).

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### Summary of findings

Within 20 days, 12 of which fieldwork, the expedition worked in two different areas about 400 km far from each other. Ten days were devoted to work in the Baoshan district - in particular - on the territory of Gaoligongshan National Nature Reserve. About that time, 6 horizontal and 2 vertical caves were explored. (Fig. 3). The most interesting was the lava tube cave Djin Fu Dong near Tengchong Town.

The expedition worked two days in an area located about 60 km from Kunming - the provincial capital of Yunnan. The work was concentrated in the so-called Yenze Dong (Swallow cave). Total length is 1514 m. Depth – 95 m.

The next explored cave there is Da Shi Dong (Big rock cave) and it became the second longest cave explored by the joint team. Total length: 1394 m; Depth: 39.30 (-22.6 m / +16.7 m). All caves are studied on geological and biospeleological point of view.

## CAVE EXPLOARATION TEAM

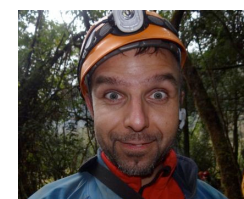
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**Boyan Petrov** Bulgarian Zoologist  
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**Konstantin Stoilov**

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**Kamen Bonev**

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**Lampros Makrostergios**

Greek

Civil Engineer



**Zhang Fan**

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**Liu Hong**

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Hydrogeologist  
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China Exploration & Research Society



**Wang Jian**

Chinese

China Exploration & Research Society



**DIARY**  
**of the Chinese – Bulgarian – Greek Speleological Expedition**  
**“Gaoligongshan 2011”**

**20 October 2011**

Flight Sofia - Munich - Beijing – Kunming – Alexander Stoev (AS), Alexey Zhalov (AZ), Boyan Petrov (BP), Kamen Bonev (KB), Constantin Stoilov (CS)  
Flight Sofia – Kiev – Beijing - Kunming - Lambros Makrostergios (LM)  
Meeteng with Zang Fan and accomodation in hotel Lotus. Dinner.

**22 October 2011**

Meeting of the exploration team in the Office of China Exploration & Research Society (CERS) located in Kunming University. Discussion under the program of the visit. Sightseeing and shopping of some necessary gear.

**23 October 2011**

Excursion to Stone Forest in Shilin County (N24.81837 E103.32316, 1706m.) and the famous Jiuxiang Scenic Area including the Cave System (N25.06692 E103.38310, 1741m)

**24 October 2011**

Travel by Geep and Bus to Ermu village in order to explore Yenze Dong (Swallow cave). N24.81946 E102.47635, alt. 2031m.a.s.l)

The exploration team was composed as follows: Alexander Stoev (AS), Alexey Zhalov (AZ), Boyan Petrov (BP), Kamen Bonev (KB), Constantin Stoilov (CS), Lambros Makrostergios (LM), Zahn Fan (ZF), Wang Jian (WJ), Liu Hong (LH), So Shu Xuan (SX). The cave is located in the bottom of the uvala. The first part is horizontal and followed by vertical passage of 3 steps (pits). A little river flows in the bottom. The native people intent to use river for water supply, so they install in the cave a system of iron stairs, pipes and electric circuit to make possible the water pumping. The team divided into two groups. The first one - Alexander Stoev, Boyan Petrov, Kamen Bonev, Constantin Stoilov, Wang Jian, Liu Hong and So Shu Xuan, started the exploration downstream. The second group - Alexey Zhalov, Lambros Makrostergios, Zahn Fan, explored upstream passge. Later Alexander Stoev, Boyan Petrov, Kamen Bonev and Constantin Stoilov began the cave mapping starting from the entrance. Alexey and Lambro mapped a little passge upstream. During the exploration 700 m in length with 95 m in depth was mapped.

**25 October 2011**

Travel from Kunming to Xiangyun Town center of Xiu Yun municipality. Meeting with the Mayoress and visit of the Qing Hua Dong in order to give expert opinion under the urbanization of the cave as a touristic site. Qing Hua Dong (N25.44883 E100.54831, alt. 1974 m). The visit took more than 2 hous. Later the entire speleo team took part in the Meeting, ogranised by the hosts. During the event all of us, form the the position of our profession, share impressions and opinions under the project for cultivation of the cave and its practical implementation. In the evening we were kindly invited to a dinner. Later we visited a lounge for foot massage. In the evening Boyan Petrov – the zoologist of the team, put clapnet in front of the cave entrance to catch bats living in the cave and determinate them.

**26 October 2011**

Travel form Xiangyun to Dali – the old capital of China. Sightseeing of the old city and charge of fuel. Driving to Baoshan sity (~ 4 hours ~300 km). In the suburb of the sity, the team was welcomed by Mr. Lin Rutau - Section Chief in Gaolingongshan National Nature Reserve (Baoshan Administrative Bureau). Later – accommodation in the hotel and visit of Wofusi (Wofu) Tong (Reclining Buddha Temple) N25.20849 E99.20022, alt. 1692 m. The temple is located in 15

km far from the city in the foot of Yunyang Mountain and is dedicated to Buddha. It was first built in the year 716 of the Tang Dynasty (618-907) and consisted of 4 halls, with the major one being the cave with length ~ 60 m. The Reclining Buddha statue lies in the entrance chamber, about 6 metres in length and carved with white jade. Besides, there are many other sculptures stored in the hall. It is the biggest of its kind in China. Cave fauna was collected.

### **27 October 2011**

Gathering 7:30ч. Breakfast and meeting with Mr. Ai Huai-sen – secretary of the Gaolingongshan National Nature Reserve. Travel (~ 1 hour) during drizzling rain to the valley of the Salween River and departure to the Bin Men Village. Trekking to Bien Fu Dong № 1 (Bat cave) (N25.09549 E98.82200, alt. 810 m). The action plan was one group to make a recognizing trip and the other - to start the surveying from the entrance. The prospection shows that the morphology of the cave is complicated and it is longer than the time for mapping we have. Furthermore the directorate of the reserve didn't need the map for the present. The team and the staff of the reserve headed by Mr. Ai explore the cave. The film crew of 2 persons documented the penetration. Late afternoon - supper and celebration of the birthday of Lambros. Later - accommodation in the hotel in the nearest town.

### **28 October 2011**

Meeting in 7:30 a.m. Breakfast and travel firstly to the main way and then on the forest road. The vehicles stopped in the big parking, located high in the mountain (1850 m). After trekking of ~ 45 min, the team reached the Fong Dong (Windy cave) N24.91959 E98.81477, alt. 1774 m.

A. Stoev rigged the entrance pitch. All cavers, without A. Zhalov, dropped in and started the exploration and mapping (A. Stoev & C. Stoilov). B. Petrov collected cave fauna. Length : 46 m; Depth: - 17.6 m. In the evening B. Petrov went to Bien Fu Dong (1) to put a clapnet in its entrance so to catch and determine the bats, living in the cave.

### **29 October 2011**

Breakfast. Travel (mainly of forest roads) across Monle River valley. Climbing the steep (45-50 degrees) slope of the valley and reach the cave named Bien Fu Dong №2 (Bat cave), Hemu village, N24.98442 E98.80489, alt. 1296 m. The surveying team of all Bulgarian cavers divided into two groups (A. Stoev & C. Stoilov and A. Zhalov, K. Bonev, L. Makrostergios) and started the mapping from the two terminal points of the cave. B. Petrov looked for and gathered cave animals and determined the bats. In the evening the expedition team traveled to Gaolingong Mountain Center for Research & Teaching and settled there.

### **30 October 2011**

In the morning - Sightseeing trip around the ecopath of the reserve. In the afternoon B. Petrov and A. Stoev and C. Stoilov visited and surveyed the Bian Fu Dong № 3 (Bat cave), Beihualin village, N25.26111 E98.83943, alt. 987 m. Length: 94.5 m; Depth: +22 m. B. Petrov collected cave fauna and determined bats: *Hipposideros armiger*. *Rhinolophus* sp., cf. *hipposideros*.

During the exploration other members of the team - K. Bonev, A. Zhalov, Zang Fan, Mr. Li, etc. made a sightseeing trip to Shuanghong Bridge, built over the Salween River ~ 300 years ago.

### **31 October 2011**

Travel to the valley of Monmei River. Exploration and mapping of Aouxia Dong cave N 24.77925 E98.92201, alt. 724 m.

The cave was surveyed from C. Stoilov and A. Stoev for 5 hours. Length - 190 m. B. Petrov made zoological observation. Later, the entire Chinese-Bulgarian-Greek team travelled to the High altitude Center of Gaolingongshan National Nature Reserve - 2177 m (N24.82909 E98.76755 ).

### **1 November 2011**

A trip to Tengchong (~ 40 km) center of the same name County. There are as many as 70 volcanoes within 100 kilometers of Tengchong County. The Tengchong is just located on lavas. In the vicinity of the town is located the Lava tube Djin Dong cave (N25.03170 E98.43969, alt. 1642 m). The exploration team divided into two groups - L. Makrostergios, A. Zhalov, K. Bonev who started the surveying of the scandent branch of the cave. C. Stoilov, A. Stoev & B. Petrov mapped the downgrade part. Meanwhile B. Petrov searched the passages for cave fauna. After 2.30 hours, the team mapped 729 m with amplitude of 94.10 (-24.3m / +69.8)m. After caving, the team was accommodated in the hotel in Tengchong. In the evening all together had dinner in a traditional restaurant, close to the town.

### **2 November 2011**

Travel to the native town (village of Mr. Ai). Local guide joined us, so the team caravan became 4 jeeps and minibuss. The group climbed up to the mountain road and after 45 min reached the Baiyanzi village. After trekking of about 30 – 40 min, we reached the entrance of Wu Shao Ming Dong cave (N25.45159 E98.60404, alt. 2092 m). C. Stoilov went into the cave from the entrance to the bottom (depth 118 m.) All cavers without Alexey, dropped in and started exploration. The cave was mapped from C.Stoilov, A.Stoev, L.Makrostergios. Total length: 255 m, Depth: 118.1 m. The team got back to the town . Accomodation in the little hotel. Supper.

### **3 November 2011**

Travel to the last place of cave exploration in the territory of the Reserve. Firstly on asphalt road, later - on forest road. Round about – hills marked the presence of tower karst. Reaching the house of the Park section covered the conterminous (with Mianmar) part of the reserve. Treking ~ 30 min to the Bian Fu Dong № 4 (Bat cave), Tze Ze village, Minguan town (N25.77548 E98.67402, alt. 2091 m). As usually the surveying team divided in two - C. Stoilov & A. Stoev with the aim to map the raight branch of the cave, and K. Bonev, L. Macrostergios & Alexey – to map the left branch. B. Petrov observed the cave fauna. The surveyed length of the cave was: 272 m; Depth: 10.80 (-7.9m / +2.9)

After the exploration, in strong rain, the team got back to Tengchong Town, where was accommodated in the same hotel as before.

### **4 November 2011**

After breakfast we have an incident. Alexeys' right hand finger was battered by the door of the bus. Later the team drive to Baoshan Sity (100 km) and by the way stopped in the High Altitude Center of the Reserve. There the film crew took interviewes from some Bulgarians (Kamen, Boyan, Alexey). Arriving in Baoshan and accommodation in the hotel.

### **5 November 2011**

Until midday, the Bulgarians worked under the preliminary public presentations of the field work in the Directorate of the Resemve. After dinner, the cavers went to the directorate building and washed and cleaned the ropes and all caving gear in its yard. After that was held the meeting with the following agenda:

Presentation of the Gaolingongshan National Nature Reserve (Baoshan Administrative Bureau) by Mr. Ai Huai-sen – Secretary;

Preliminary report of cave survey – C. Stoilov;

Preliminary report of biospeleolgical studies – B. Petrov;

Preliminary report Geology – K. Bonev;

Posibilities for the creation of tourist attractions on the territory of the reserve – L. Makrostergios;

Prorposition for creation of data base for the reserve – A. Stoev;

A. Zhalov made conclusions and expressed the appreciation of the team for the hospitality. After that, he presented Mr. Al Huai-sen with a badge of honour of Bulgarian Federation of Speleology.

Mr. Al Huai-sen presented diplomas of the Reserve to the members of speleological team! Later all together took part in the official dinner.

### **6 November 2011**

Departure from Baoshan to Kunming. On the way - visit of the famous Dinosaur Valley and Lufeng Dinosaur Museum. Arrival in Kunming and accommodation in Hotel Lotus. Dinner in Chinese - KFC together with the American zoologist Paul Buzzard from CERS.

### **7 November 2011**

Day for rest, sightseeing and shopping. Visit of some bookstores and Kunming market for traditional souvenirs.

### **8 November 2011**

Travel to Ermu village in order to survey so called Da Shi Dong Cave and to continue the mapping of Yenze Dong (Swallow cave). Arriving there, the team divided into two groups - L. Macrostergios, K. Bonev and A. Zhalov together with Ashu went to Yenze Dong. Surveyed length: 1514 m; Depth: - 95 m

The others - to Da Shi Dong (Big Rock cave) ( N24.82090 E102.46514, alt. 1940 m). The first group surveyed ~ 800 m passages and ended the exploration of Yenze Dong and joined the Da Shi Dong team. There they mapped the entrance part (150 m) of the cave. C. Stoilov and A. Stoev started his surveying from the bottom and found new branch of the cave. They got out 9.30 p. m. after over 6 hours of mapping. The final length of the cave was 1394 m, depth: 39.30 (-22.6m / +16.7).

B. Petrov observed the cave for fauna. Some cave fauna was collected. Five kinds of bats were determined also.

### **9 November 2011**

Visit of the Yunnan Museum of Natural History. Later the Bulgarian team got back to the hotel to complete the compilation of the cave surveyings, biospeleological report, diaries. In the evening - farewell supper with the members of the joint team.

### **10 November 2011**

Departure from Kunming to Beijing. The Bulgarian team spent one night in Beijing, but L. Macrostergios flew via Kiev to Sofia.

### **11 November 2011**

After the night in Beijing, the members of Bulgarian flew to Sofia via Frankfurt.

## **Administration and logistics**

### ***Travel and internal transport***

The expedition members from Bulgaria and Greece were responsible for arranging their own transport to Kunming. The fifth Bulgarians flew from Sofia to Beijing on Lufthansa Airlines via Munich. Greek colleagues took the alternative option of flying to Beijing on Ukrainian operator Aerosvit Airlines.

Transport between Beijing and Kunming of all non Chinese participants were made by internal flight on China Air .

The expedition accessed the Baoshan and the mountain range directly from Kunming by a jeep Land Rover and minibus Ford – Transporter belonged to China Exploration & Research Society (CERS ) Yunnan branch

Equipment from the Bulgaria was carried to China with expedition members.

### ***Food and Accommodation***

In Kunming Bulgarian and Creek cavers was accommodated in Lotus Hotel. During the working time of expedition in Baoshan county (Gaoligongshan area) the team use different local hotels. When in town and some little villages the expedition ate traditional Chinese food at some local restaurants.

### ***Permission and permits***

Travel in China requires a tourist visa. This is obtainable (in the Bulgaria & Greece) from the Chinese Embassy in London respectively Athens free of charge.

The expedition carried an official letter of invitation from Yunnan institute of Geography. No further permission was required for this expedition.

### ***Vertical caving***

Exploration of vertical caves used single rope technique (SRT), usually on 9 mm and 10 mm rope. Most of the expedition members were experienced cavers already well versed in this technique.

### ***Documentation***

#### **Recording of entrance locations**

Whenever possible, entrance locations were recorded by means of GPS (Global Positioning System). Readings were recorded as UTM grid coordinates, using the WGS84 datum parameters. The UTM zone is 47R. Photographs were taken of all cave features and entrances to aid future location .

#### **Cave surveying**

The expedition used precision sighting compasses professional geological compass Freiburger Präzisionsmechanik (DDR) and Clinometers (Suunto) . The lengths' were measured with Bosch Laser Distance Meter (Bosch Professional DLE 50) and an Chinese Laser Distance Meter.

All surveying data were computerized and fully or partially processed at place under Autocad and On Station programs. The cave surveys in PDF format are available at or can be requested from China Explorers or Gaoligongshan National Nature Reserve (Baoshan Administrative Bureau).

#### **Photography**

Members of the expedition carried simple photography equipment (SLR and HD /digital cameras, small flashguns). The Greek colleague use HD video camera "Panasonic". Some of the expedition photographs and video film was placed online at:

<https://sites.google.com/site/chinaexpedition2011/>

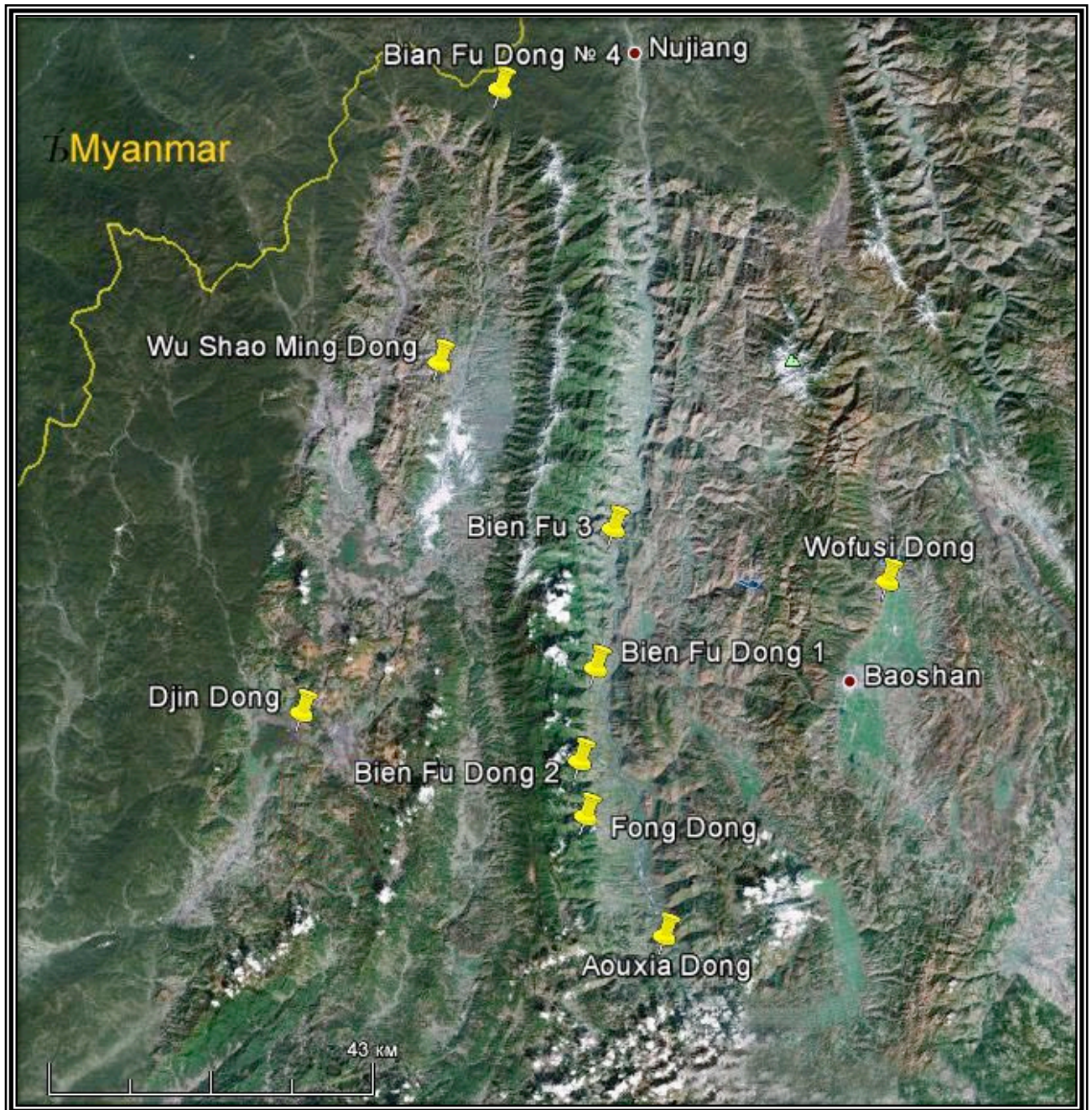


## Cave Locations and Descriptions

### EXPLORED AND SURVEYED CAVES

| No. | Cave name                   | Altitude (a.s.l.) | Length (m)     | Depth (m)                     |
|-----|-----------------------------|-------------------|----------------|-------------------------------|
| 1   | Aouxia Dong cave            | 724               | 195            | -8.3                          |
| 2   | Swallow Cave 2              | 1970              | 20             | -                             |
| 3   | Bien Fu Dong № 2 (Bat cave) | 1296              | 429            | -24.4                         |
| 4   | Bien Fu Dong № 3 (Bat cave) | 987               | 94.5           | +22                           |
| 5   | Bien Fu Dong № 4 (Bat cave) | 2091              | 272            | 10.80 (-7.9m / +2.9)          |
| 6   | Fong Dong (Windy cave)      | 1774              | 46             | -17.6m                        |
| 7   | Lava tube Djin Dong         | 1642              | 729            | 94.10 (-24.3m / +69.8)        |
| 8   | Wu Shao Ming Dong           | 2092              | 255            | -118.1                        |
| 9   | Yenze Dong (Swallow cave)   | 1970              | 1514           | -95                           |
| 10  | Da Shi Dong (Big rock cave) | 1940              | 1394           | 39.30 (-22.6m / +16.7)        |
| 11. | Yenze Dong 2                | 1930              | 20             | -                             |
|     |                             | <b>Total</b>      | <b>4 972.5</b> | <b>429.60 (-318.2/+ 89.4)</b> |

## Caves in Baoshan County The Caves in Gaolingonshan area



### Aouxia Dong Cave

The cave is located 1.9 km SE from Ling Gongzhai and 3.20 km NW Longtang in the left bank of the Monmei River.

WGS Coordinates: N24.77925 E98.92201.

The entrance is disposed at 15 m above the bank of the river at 742 m altitude. The main direction of the cave development is NW and follow on the train of the existed fault. The entrance has triangle form and dimensions 1.50 m wide and 1.20 m high. Low grade passage leads to 1st hall, which dimensions are 9 m length, 8 m wide and 3 m high. The next passage twists and reaches the 2nd and last room of the cave (13x 5 x 4 m). Later the character of the cave became labyrinth, caused by the big boulders. The cave is without decoration as stalactites, stalagmites etc. It is dry and hot (temperature 23,0°C). Total length: 190 m. Depth: - 8.30 m.



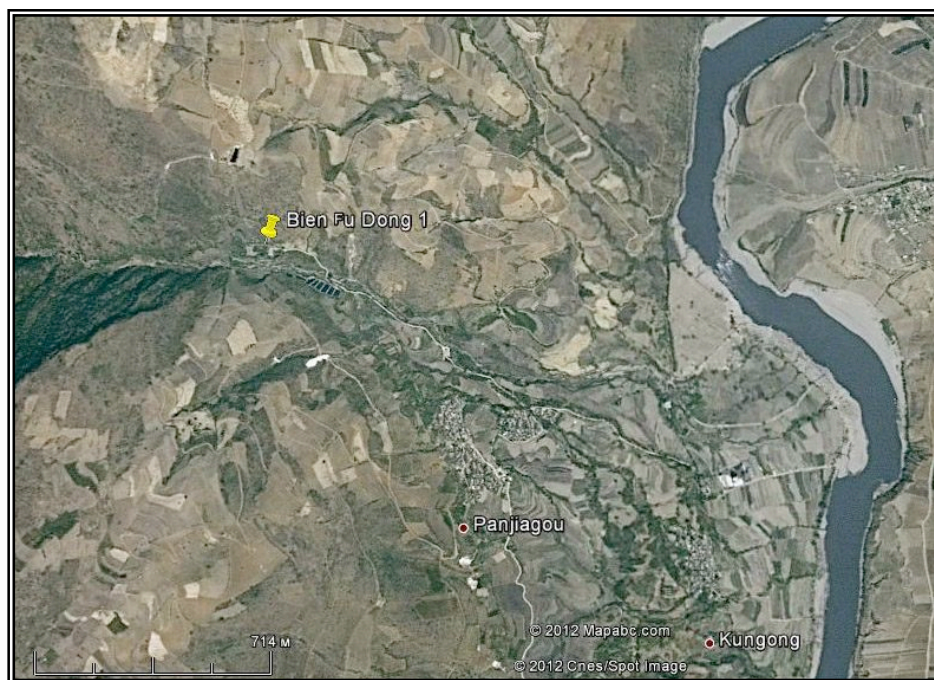
## Bien Fu Dong № 1 (Bat cave)

The cave is located at the foot of the western slopes of Nujiang (Salween) River. The entrance is located 1.01 km NW from Ponjiagou village (Bin Men village) at 810 m altitude.

WGS Coordinates: N25.09549 E98.82200

The entrance has semi elliptical form with dimensions 3 x 2 m. The cave is a straight-line gallery without branches, with approximate length of 1500 m and light dip. In fact, this is an underground brittle unstuck, tracking down inside a plastic shear zone. The zone is 50-80 m wide. It progress in N-S direction ( $350^{\circ}$ - $170^{\circ}$ ), and slips down to east with mainly  $45^{\circ}$  dip. This zone represents one of the westernmost sub-parallel ductile faults that take part of the Nujiang Fault System.

The mylonites in the zone are developed above a monotonous mudstone matrix. They contain new-formed muscovite, sericite and chlorite that indicate greenschist facies conditions of their formation. The muscovite sheets reach to 1 cm width. They represent the most abundant mineral in the greenschist paragenesis. The observed shear-sense criteria indicate that the zone was affected of sub horizontal dextral strike-slip plastic shear. This cave has nothing to do with the karst. It is purely tectonic phenomenon. There are not carbonate rocks in the area. In some places inside the cave, there are fractures into the rocks with cooling or dribble water inside, slightly enriched in  $\text{CO}_2$ , which precipitate some centimetric stalactites. The temperature of the air inside the cave is  $18.4^{\circ}\text{C}$ .





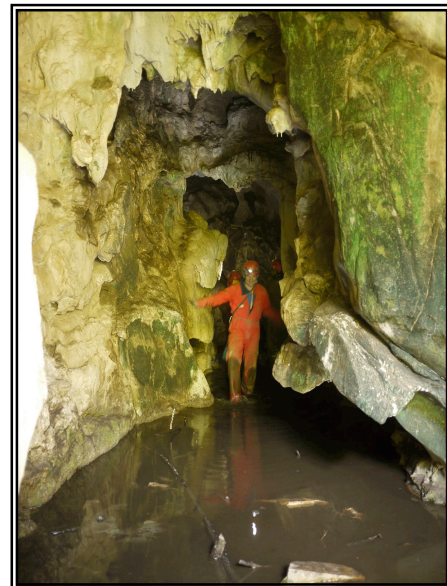
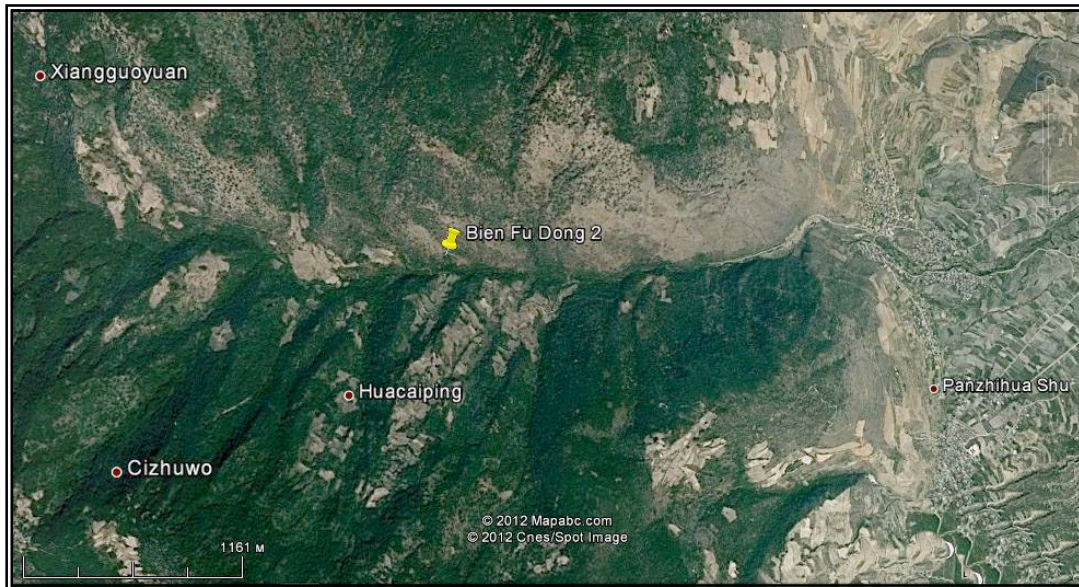
### **Bien Fu Dong №2 (Bat cave)**

The cave is located 2.6 m far from the Zhangmingshan Village ( Hemu vill ) on the right side of the Monle River. The entrance is situated ~ 60 m higher from the river in a cliff located on the N slope of the river valley. Altitude - 1296 m altitude.

WGS Coordinates: N24.98442 E98.80489

The cave is a spring. It is a typical karst phenomenon, formed through the system of brittle fractures that inherited the ductile fault. It is a single meander developed along the fissure with direction S-N. It is formed in marbleized limestone, immediately below their contact with black mudstones. The contact itself is tectonic - a ductile thrust fault developed in the conditions of greenschist facies. The limestone and the mudstones are strongly mylonitized. In the first couple of meters below the contact, the limestones contain many lenses and levels from the mudstones. The mylonitic foliation from the two sides of the contact is sub parallel to the stratification. It slips down to East with mainly 50° dip. The mineral lineation climbs to NE.

The entrance has half episodic form with dimensions 5.60 m wide and 5 high. The first part is dry. The right side of the entrance is formed as a bed of the river which comes out from the cave. Discharge ~ 1-2 l/sec. Strait away after the river covers all surface of the gallery. The passage ended with a like formed by the water which springs from the underwater fissure located on the foot of the wall. In the left (W) side of the gallery there is a threshold (step) of + 3-3.5 m which lead to the upper and dry level of the cave. The passage keeps its character about 30 m. In this place the river, coming from inside hides in a narrow appendix in left. The gallery continued upstream around 40 m. Ahead, from where the water comes, it become narrow and not passable. The cave continued in upper level reachable after short free climbing (+ 4 m). Here the air temperature of become higher ( ). The next 110 m are relatively more confined (1.2 m wide; 1.5 m high). Further there is 10 m of narrow, after which the cave becomes wider and higher. After 100 m the gallery turned. Then the cave becomes low, narrow and branched. The right branch is scandent and its end marked the highest point of the cave +32 m. The total length of the cave is 429 m, and the Depth: + 32 m. The cave is surveyed at 29 October 2011.

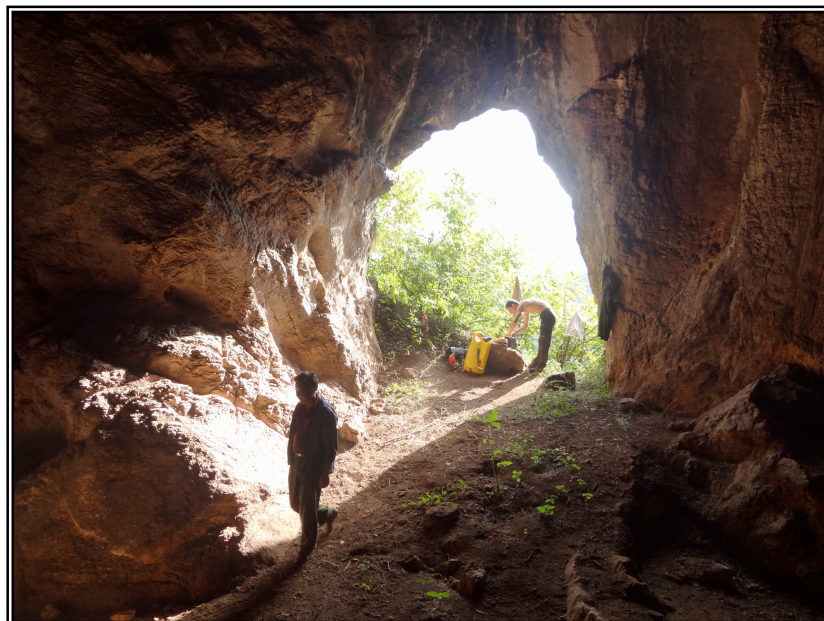
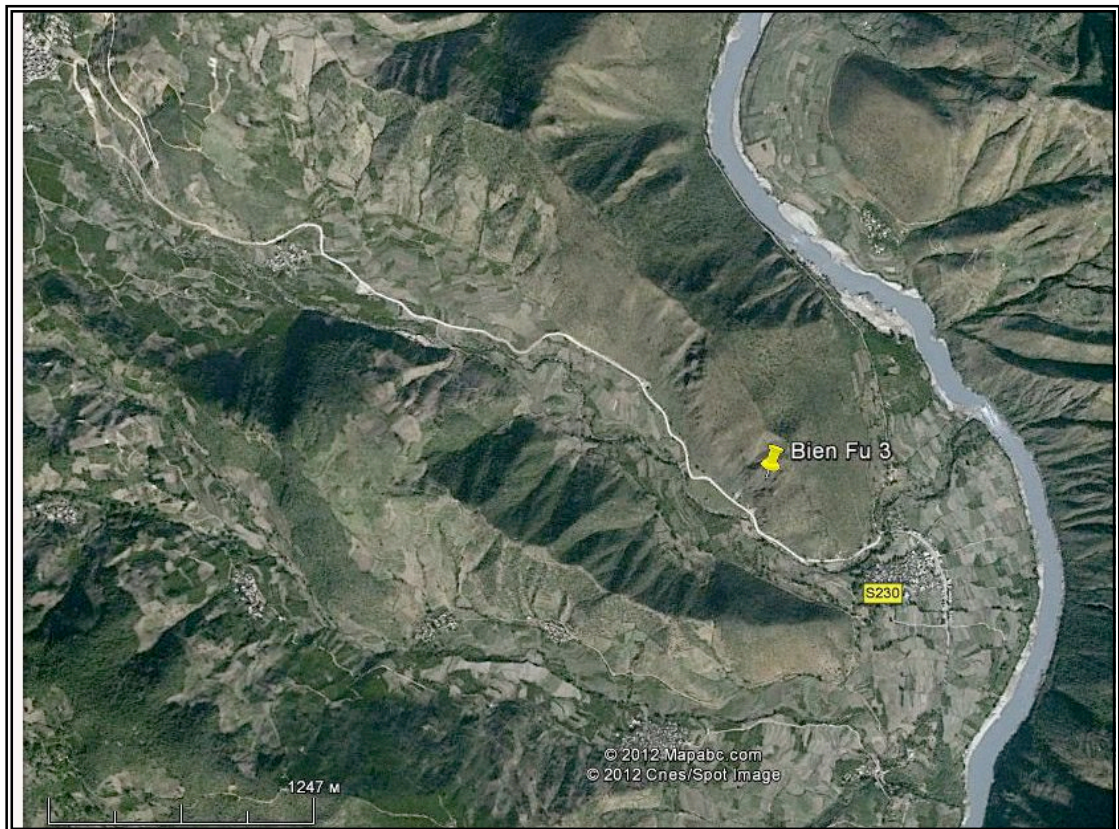


**Bien Fu Dong № 3 (Bat cave)**

The cave is located 800 m NW from the Gangdang village high on the SW slope of the hill. Altitude: 987 m altitude.

WGS Coordinates: N25.26111 E98.83943

The entrance is 3.9 m wide and 4.4 m high. It leads into a big lighted hall 30x40 m. Approximately 15 meters upper there is another room, reachable after free climbing. There is a little pool in the room. The cave continued with a chimney + 4 m. Total length: 94.5; Depth: + 22 m. The cave is surveyed on 30 October 2011.



**Bien Fu Dong № 4 (Bat cave), Tze Ze village, Minguan town**

The cave is located 6.9 km NE from Kongshuhe village (Tze Ze village).

WGS Coordinates N25.77548 E98.67402.

The cave is disposed on the left (SW) bank of the river at NW slope of the hill. The main direction of development is NS. It has two entrances - lower disposed at altitude 2091m. and upper which is higher. The lower one is 1.2 m wide and 1 m high. Little vertical passage leads to a crossing of two horizontal galleries. The first one with running river (discharge ~ 5 l/sec) and

the second one is dry. The upstream passage is 25 m long with average dimensions 2 m wide and 2.2 m high. Then the gallery branch it two passages as Y. The river is coming from the sump on the end of the left one. Downstream the river flows few meters and hides in a fissure. The first part of the dry passage is 30 long – the profile of the gallery is semi ellipsoid with average dimensions ~ 1.30 m wide and 1.50 m high. This leads to little room, where is the second crossing. The left branch goes 49 m in N-NE. The bottom is covered by clay. The walls and selling are covered of stalactites, stalagmites and flowstone concretions. In the north direction from the room leads low, oven-shaped and covered with clay passage (length 18 m). Further the gallery became high and finished in the foot of a vertical wall – 9 m high. After climbing, descending and some more meters of walking the cavers reach the room just before the second (upper) entrance of the cave (0.75 m wide; 2 m high). The total length of the cave is 272 m. Depth 10.80 (-7.9m / +2.9). The cave is surveyed at 3 November 2011.



**Fong Dong (Windy cave)**

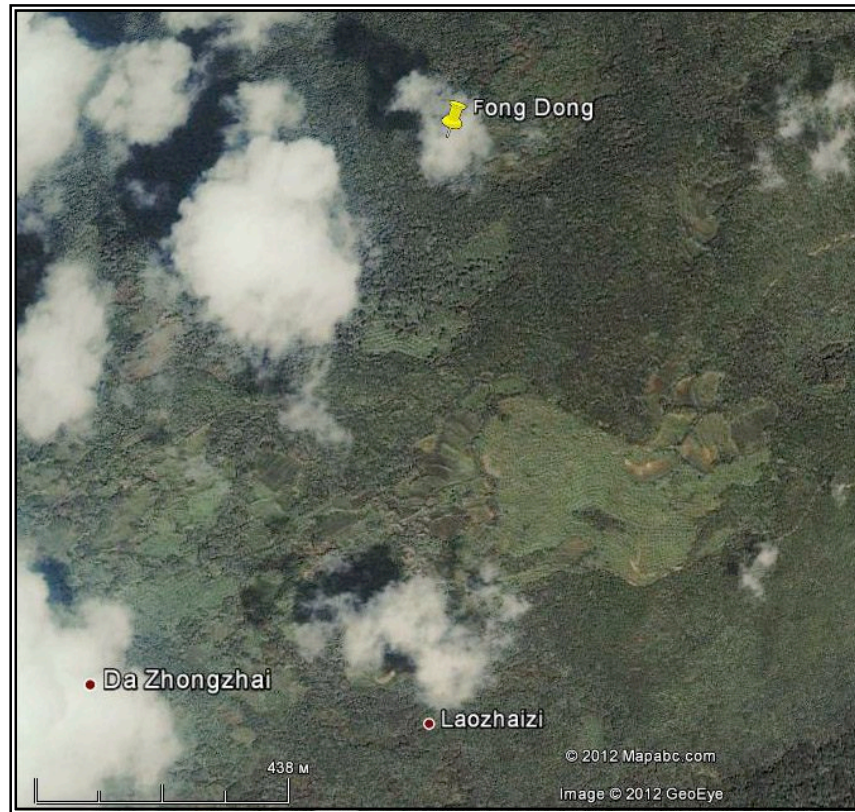
The cave is located 670 m N from Duen Dong village. Bao Shan District.

WGS Coordinates N24.91959 E98.81477



The vertical entrance of the cave is opened in the forest on the N slope of the hill. Its altitude is 1774 m. It has oval from (1m x 0.8m) The entrance pit looks like a funnel and is 6.5 deep. Downwards the cave continued with descending gallery, covered by boulders and mud.

The cave ended with boulder shock (depth 17.6 m) whence it is strong draught. The cave is without decoration. The name is coming from the drought form the entrance. Explored and surveyed on 28 October 2011. Total length: 46 m. Depth: 17.6 m.

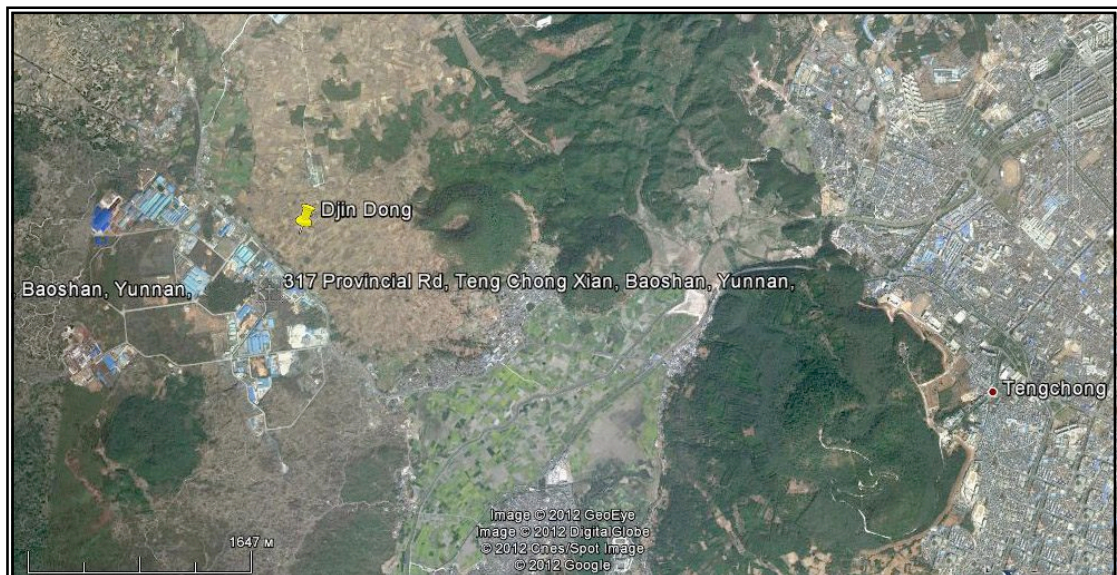


## Djin Dong Cave (Lava Tube)

Djin Dong is a lava tube cave, formed by Pleistocene basaltic-andesitic lava flow. It is located 5.6 km W-NW from Teng Chong town and 0,350 km NE from stone kibbler factory, located in (Teng Chong Xian neighborhood) on the right side of the provincial road 317. The entrance is situated at alt. 1642 m in the middle of the vegetable field 1.2 km west from the massif of a proto volcano.

WGS Coordinates: N25.03170 E98.43969

The main direction of the cave development is W – NE, so the gallery followed the way of the lava, coming up form the volcano. The entrance is elliptic (6.5 x 4.5 m) and vertical. After a drop of 2.5 m the cave branches into two directions E-NE, where the passage is going upward and W - which development is downwards. The length of the law grade passage is 210 m and its depth is – 24.3 m. The scandent branch is 518.50 m long with a depth of + 69.8. The main form of the gallery is oval, but in some places becomes triangle with dimensions in the range from 2-5 m width to 1.5 m – 6 m high. The floor of the whole cave is covered by basalt blocks, filmed by thick layer of mud and guano. The cave is without decoration, but from some fractures in the ceiling dribble slightly enriched in CO<sub>2</sub> water, which precipitate some centimetric stalactite embryos. It is wet and hot (temperature in the scandent passage is 15,3°C and in downwards one is 1-2°C lower. Total length: 728.5. Depth: 94.1 (-24.3); +69.8 m.





Calcium Carbonate precipitation



Calcium Carbonate Concretion



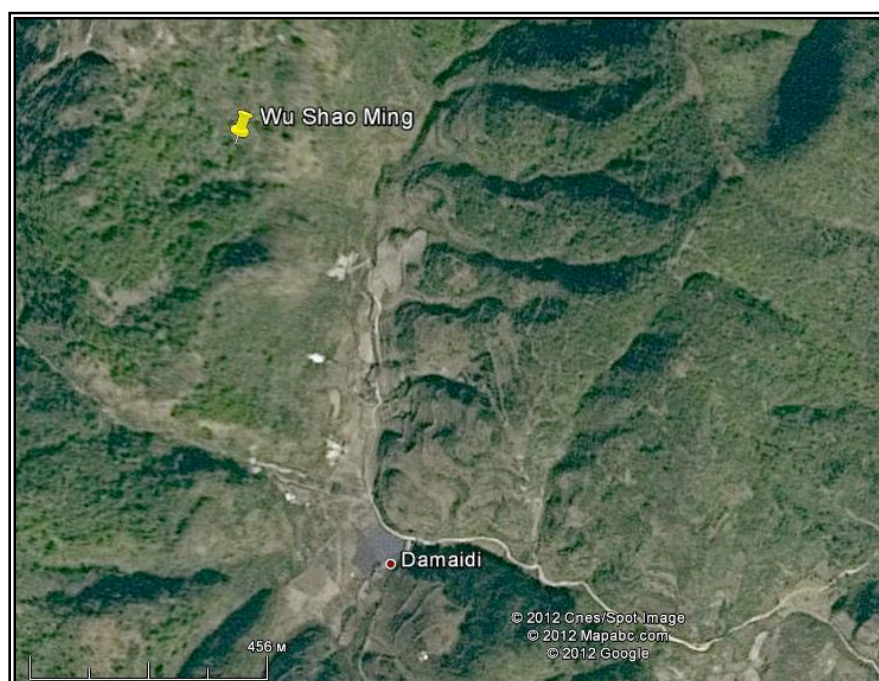
Lava melt flow stalactites

## Wu Shao Ming Dong cave

The cave is located ~ 800 m NW from Damaidi village. The entrance is disposed at 2092 m altitude. it has round form and diameter ~ 5 m.

WGS Coordinates N25.45159 E98.60404, altitude 2092 m.

The first pit (P1-10.20) ended at little stony ground where the second one begins. The drop of 17 m lead to room covered with soil, fallen trees and leaves. The third pit is the deepest one of the cave (-69 m). There is big boulder in the bottom and all around is covered with clay. Sidewards, after the getting over of little scandent passage (20 m in length) there the is a pit 13 m deep. The bottom is a crossing point of 3 galleries all of which lead to 3 different pitches. The first one is reachable after technical free climbing of a highly scandent paving stone. (Depth 19 m). The next two are located lower from the bottom they are respectively 17 and 10 m deep. In the bottom of the 17 shaft there is the lowest point of the cave. The total length of the cave is 255 m. Depth 118.1 m. The cave is surveyed at 2 November 2012.

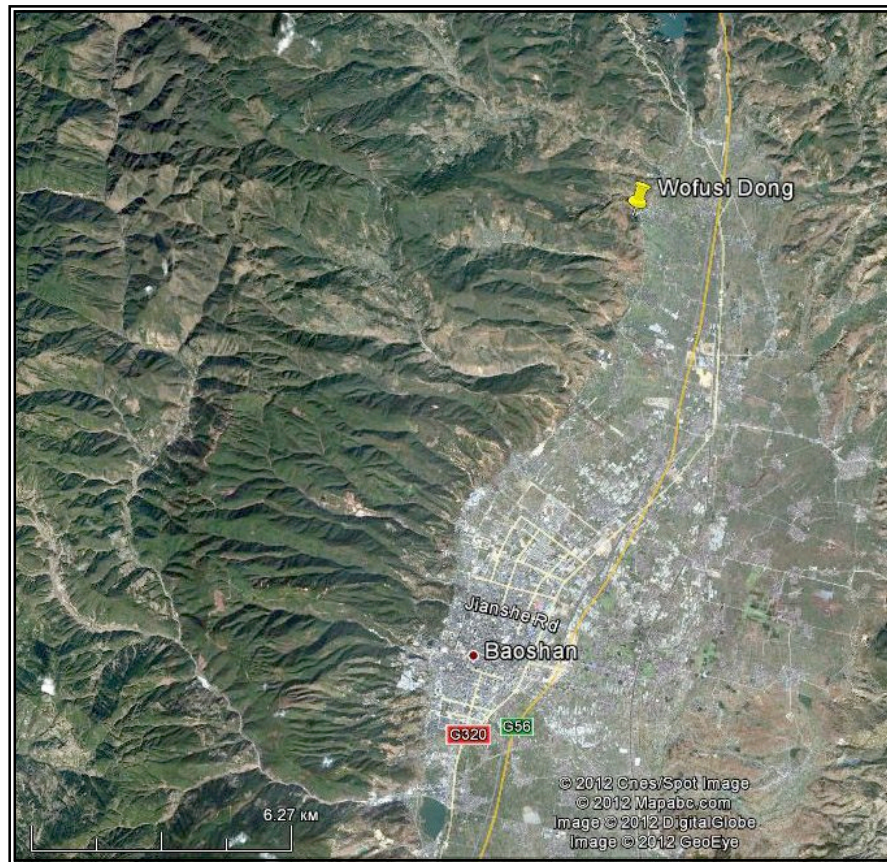


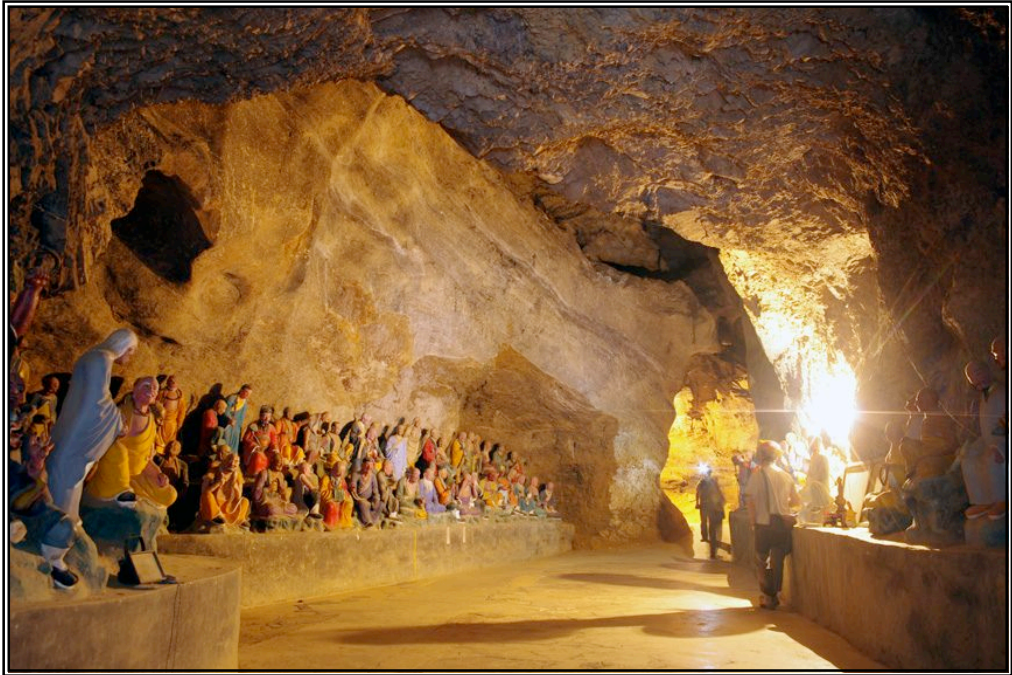
### (Wofu) (Wofusu) Tong (Reclining Buddha Temple)

The cave is located 11.5 km NE from Baoshan Town in the vicinity of Wofocun Village in the foot of Yunyang Mountain.

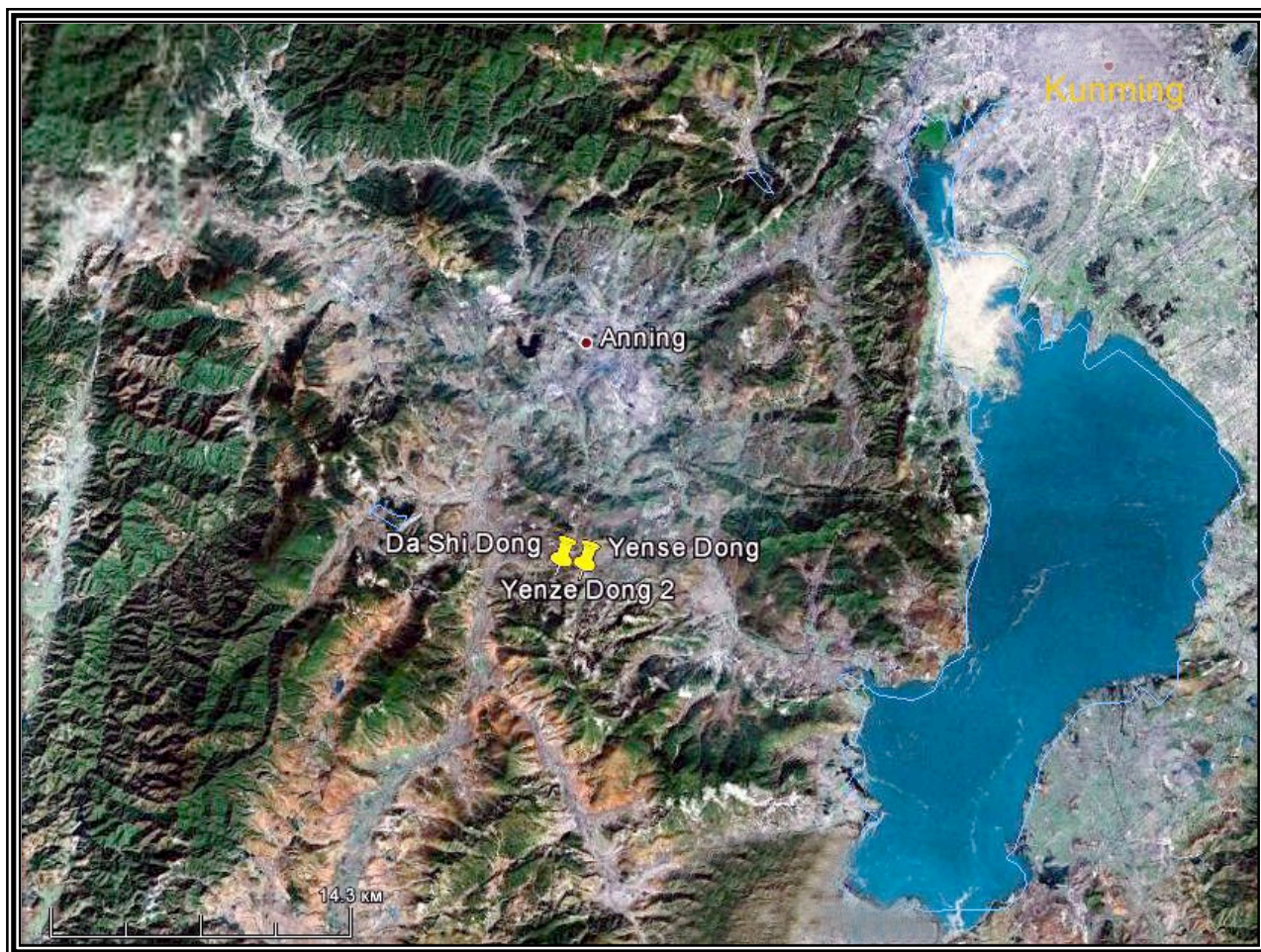
WGS Coordinates N25.20849 E99.20022, altitude 1692 m.

The temple is dedicated to Buddha. It was first built in the year 716 of the Tang Dynasty (618-907) and consisted of 4 halls, with the major one being the cave with length ~ 60 m. The Reclining Buddha statue lies in the entrance chamber, about 6 m in length and carved with white jade. Besides, there are many other sculptures stored in the hall. It is the biggest of its kind in China. Cave fauna was collected. Total length: ~ 60 m.





## Caves in Kunming County



### Da Shi Dong (Big Rock cave)

The cave is located 800 m S-SE from Houchang village (Ermu village) Kunming District  
WGS Coordinates: N24.82090 E102.46514

The entrance is opened on the cliff, formed the SW slope of the blind valley (uvala - 50 m wide x 80 m long). Little stream runs in the bottom and sinks just in front the entrance and joins to a bigger underground river. The catchment area of the stream is large, so in the cave there is a danger of flood. The cave is developed along 3 main fissures with directions E-W, NW-SE and NE-SW.

The entrance is 27 m wide and 17 m high and disposed at 1940 m altitude. It shows in a large passage (hall) – 48 m long, ~ 20 wide and high within 17 – 12 m, covered with boulders and clay. Multiple smaller entrances are visible in the rocks. Further the passage begins to get lower and lead to a little room (high 1.30 m.) – the first crossing of the cave. Here the little stream springs and runs through 77 m of narrow passage, ended by sump (or siphon). The ending is a typical big clay stopper, so probably the gallery continues, but only the water can go trough. In the NE side of the room starts the main gallery of the cave. Its total length is 676 m, but in the middle of this distance the cave joins a branch with length 355 m, direction of development SE. Both galleries go upstream and with small slope. About 250 m from the entrance, there is a 5 m drop with water on the bottom (water is about 1-1.5 m deep). The NE gallery alternates large halls with high ceiling (up to 22m+) and huge formations and narrow passages following the river.

The SE gallery is much smaller with only few bigger halls and a lot of very narrow passages. On many places it looks like it will end and you need to crawl in the water a lot. There is a vertical chimney (7-8 m easy to climb), where the water is crossing a plate with falling water. After it's half, you can find a lot of household waste, so it should be connected (and close) to a place, where the water comes in and the local people use as a dump. Total length: 1394 m; Depth: 39.30 (-22.6 m / +16.7 m). The cave is surveyed at: 8 November 2011.



### **Yenze Dong (Swallow cave)**

The cave is located 2.2 km SE from Houchang village (Ermu village) and S-SW from the local quarry.

WGS Coordinates . N24.81946 E102

The entrance is located at 2031m.a.s.l on the slope in SW side of the bottom of the uvala 0.4 km long and 0.2 km wide and direction to the long axis NW-SE. It has triangle form and is 5.50 m wide and 3.20 m high. It seems that the cave is a temporary (periodical) sinkhole. The development of the cave is based on 3 main fissures with directions: E-W; NW-SE and NE-SW. The first part is low grade and followed by vertical passage of 3 steps (pits) (P1-22 m; P2-13; P3-13 m). The native people, intent to use river for water supply, so they rigged the passage with iron stairs, pipes and electric circuit to make possible the water pumping. The stairs lead to the high and narrow in its bottom river gallery. The depth here is 73 m. The first part of downstream passage is low and narrow, the depth of the river reaches 0.7 m. The next 80 m of the gallery are higher (max.18 m) and wider (max.8 m). In the vault arch of the end of the passage in the cave there is a chimney. This is connecting point with the upper level of the same gallery. Further, the passage gets narrow again. In its end the gallery has two levels. In the lower one, the river jump 3.5 m making little waterfall, run 30 more meters and sink in a muddy sump! Here is the deepest point of the cave – 95 m. The higher passage is dry and scandent. It leads to the biggest hall of the cave (55x25x 3-6 m), where the cave branched. The left branch is well decorated by



dripstones. The right gallery turned in SW and after 60 m stopped in the edge of the pit (-15 m deep) which connect with the lower part of the same passage.

The first 25 m of upstream passage are 9 m high. The penetration is realized on the morphological level 3-4 m upper from the river bed. The next 150 m of the cave meandered. The passage is ~ 5 m wide and 2-3 m high. The river covered approx. entire surface of the gallery, but is not deeper than 20-30 cm. Lateral from the river bed there are clay-sand deposits with different thickness. The walls and selling are covered by flowstones. Further there is a crossing marked by little in area but deep (more than 2 m) lake in the right (South) side of the gallery. Up form the lake start a meandering, relatively low (1.20 m) and light scandent dry gallery. It is covered by clay and sand. There are reliable evidences, that in dry period this passage is influent to the main river. The gallery finished with a little lake. Few meters before the end the cave branched again. The opening of the passage is in left, where begins rather scandent and narrow gallery (length 70 m). The final few meters of the passage are horizontal and ends with a pit (diameter 4 m; depth – 15 m). The bottom is blind – there is the end of the passage.

Ahead from the crossing there are 110 m of wide and enough high (2-3 m) passage, which leads to a room with a big column in it. Here the gallery turned curtly in left (North) became low and narrow and not passable. Behind the column there is appendix. The passage is developed at narrow (1.30 m) and high more than 14 m fissure. Here is the end of the cave. The total length is 1514 m. Depth – 95 m. The cave is surveyed at 24 October and 8 November 2012.



### **Yenze Dong 1 (Swallow cave)**

The cave is located 2.2 km SE from Houchang village (Ermu village) and S-SW from the local quarry.

WGS Coordinates: N24° 49' 11.4" E102° 28' 35.0"

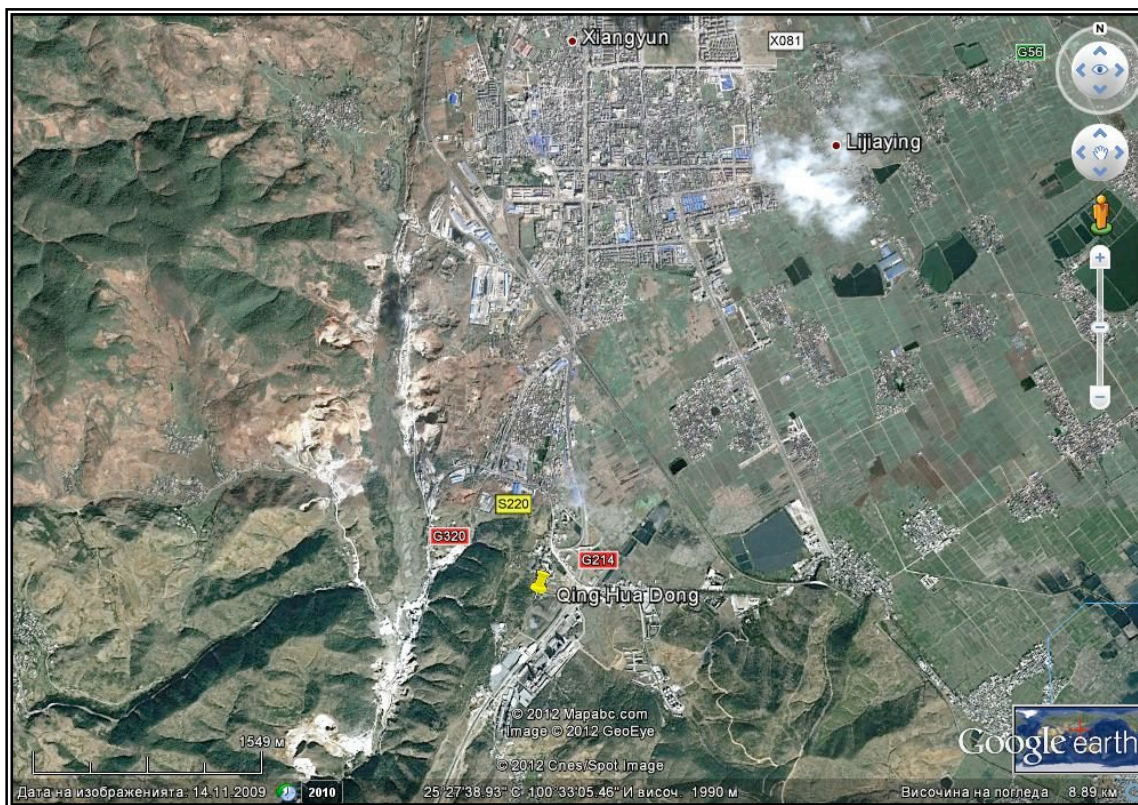
The entrance is situated at 2030 m altitude. on the slope in NE side of the uvala 0.4 km long and 0.2 km wide and direction to the long axis NW-SE. It is 6 m wide and 4 m high. The

main gallery is 20 m long and leads to the 2nd entrance 3 m wide and 0.5 m high. The second entrance comes out in the bottom to another uvala deep ~10. The cave is a tunnel with length 20 m. It is mapped in 8 October 2011.

### Qing Hua Dong

The cave is located 3.2 km S-SW from Xiangyun town, in the vicinity of its satellite settlement Shengguangcun, in the right side of the local road G320 from Xiangyun to Yijiangpu.

WGS Coordinates - N25.44883 E100.54831, altitude 1974 m.



## BIOSPELEOLOGICAL FINDINGS

During a 20 days trip, a team of five Bulgarian, four Chinese and one Greek caver, surveyed **13 caves** in Yunnan Province. Explored and mapped for the first time are six horizontal and two vertical caves. The total length of the caves mapped during the expedition came in at 4972.5 m. Five additional caves (including two show-caves and one religious cave) were only partly surveyed by the team.



Outline Map of the Studied Region in Yunnan Province

Ten days were spent working in the area of Gaoligongshan Mountain Biosphere Reserve in the Baoshan district along the border of Myanmar. The expedition was the first to explore the underground habitats and the cave fauna of this UNESCO World Heritage Site.

Rich biospeleological material was collected from all 13 caves visited by the expedition. The invertebrates were collected with soft pincets from different microhabitats (under stones, rotten logs, clay, guano, water, etc.). Only limited number of specimen was collected and stored for further identification. Larger series were taken only from those species, which were observed to be abundant and common within the studied caves. The material is deposited in the collection of the Natural Museum of Natural History in Sofia in 70% alcohol.

Preliminary investigation of the collected material showed that it includes a number of probable undescribed troglabites and troglaphiles. The list of potential new to science taxa of invertebrates includes about 10 species- two species are woodlice, one species of snails, one species of spiders, one chernetid and one chthoniid species of pseudoscorpions, one laniatorid and one cyphophthalmid harvestmen, two or three species of millipedes and one or two species of cave leaches. Other organisms recorded include centipedes, springtails, raphidophorid crickets, pselaphid and carabid beetles, cockroaches and other. No cave-limited stygobites were collected from the surveyed aquatic habitats. Generic and even the family identification of many specimens are still pending examination by taxonomists.

Partners of the expedition were the Yunnan Institute of Geography, Gaoligongshan National Nature Reserve Baoshan Management Bureau and China Exploration & Research Society (CERS). Their logistic support and hospitality was greatly acknowledged.

## LIST OF THE COLLECTED BIOSPEOLOGICAL MATERIAL

1. **China**, Yunnan Province, Kunming District, Jiu Xiang Dong Cave, N25.06692 E103.38310, alt. 1741m, 23.10.2011, B. Petrov leg.

A big and impressive show cave. Not studied.

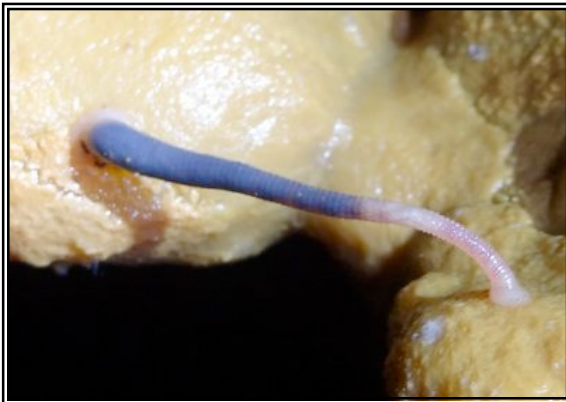
**Orthoptera:** Aemodogryllinae- 1 ind., > 50 observed at many places in the cave.



2. **China**, Yunnan Province, Kunming District, Yenze Dong cave (Swallow cave), N24.81946 E102.47635, alt. 1970m, 24.10.2011, B. Petrov leg.

A big cave, with underground river, pools, guano, clay, wet walls. Temperature= 15°C

**Hirudinea:** 10 ind., > 40 observed, widespread on the walls of the cave.



**Orthoptera:** Aemodogryllinae- 5 ind., > 50 observed in the cave.



**Araneae:** 10 ind. (? 3 species).

**Opiliones:** Laniatores- 2 ind. , troglobite?

**Coleoptera:** 1 ind. (1 species, not a cave dweller).

**Diplopoda:** 15 ind., > 100 observed, on clay and guano.



**Diplopoda:** 10 ind., > 20 observed, on clay.



**3. China**, Yunnan Province, Dali District, Qing Hua Dong cave, N25.44883 E100.54831, alt. 1974m, 25.10.2011, B. Petrov leg.

A partly developed show-cave under construction. Relatively dry and warm passages. Temperature around 16°C (not measured).

**Hirudinea:** 2 ind., on a wet wall at the end of the cave.

**Araneae:** 9 ind. (1 species).

**Chilopoda:** *Lithobius* sp.- 4 ind. (1 species).

**Orthoptera:** Aemodogryllinae- 4 ind., > 25 observed at many places in the cave.

**4. China**, Yunnan Province, Bao Shan, Wofosi Dong (Temple cave), alt. 1692m, N25.20849 E99.20022, 26.10.2011, B. Petrov leg.

Religious cave with a large Sleeping Buddha statue. Nearly fully paved floor, 10m long “wild” passage with clay and rotten logs at the end.

**Diplopoda:** 26 ind., > 20 observed, on clay and rotten logs at the end of the cave.

**Orthoptera:** Aemodogryllinae- 3 ind., > 30 observed on the wall in the dark zone of the cave.



**5. China**, Yunnan Province, Gaoligong Mt. Biosphere Reserve, Bin Men vill., Bao Shan Distr., Bien Fu Dong № 1 (Bat cave), N25.09549 E98.82200, alt. 810m, 27.10.2011, B. Petrov leg.

Very diverse environmental conditions- underground river, guano, clay, rotten logs, wet walls.  
Temperature 18.4°C.

**Isopoda:** 10 ind., on rotten logs.



**Isopoda:** 6 ind., on rotten logs, guano and clay.



**Opiliones:** Laniatores- 1 ind.



**Pseudoscorpiones:** Chthoniidae - 2 ind., under stones. Troglabite.



**Diplopoda:** Callipodida- 30 ind., > 200 observed on clay and guano.



**Diplopoda:** ? Chordeumatida - 10 ind., 10-12mm, on clay.



**Orthoptera Aemodogryllinae**- 5 ind., > 100 observed at many places of the cave.

**Araneae**: 2 ind. near the entrance (1 species); 4 ind. under stones (1 species, ? Troglobite).



**6. China**, Yunnan Province, Gaoligong Mt. Biosphere Reserve, Duen Dong vill., Bao Shan Distr., Fong Dong (Windy cave), N24.91959 E98.81477, alt. 1774m, 28.10.2011, B. Petrov leg.

A small vertical cave. Guano, clay, rotten logs.

**Araneae**- 2 ind. near the entrance (1 species); 1 ind. on web, troglobite?

**Gastropoda**: 3 ind. (2 species), not cave dwellers.

**Orthoptera**: Aemodogryllinae- 3 ind., > 50 observed at many places in the cave.

**Opiliones**: ? Cyphophthalmi - 2 ind. on clay, troglobite?



**Pseudoscorpiones**: Chernetidae- 3 ind., under stones and rotten logs.



**Diplopoda**: Callipodida- 4 ind. not collected.



**Diplopoda**:  
Family indet. - 1 ind., 18-22m.



**7. China**, Yunnan Province, Gaoligong Mt. Biosphere Reserve, Hemu vill., Bao Shan Distr., Bian Fu Dong cave № 2 (Bat cave), N24.98442 E98.80489, alt. 1296m, 29.10.2011, B. Petrov leg.

Diverse environmental conditions- underground river, shallow pools, guano, clay, rotten logs, wet walls.

**Hirudinea:** 5 ind., > 20 observed on wet walls above the river.

**Araneae:** 4 ind (1-2 species).

**Pseudoscorpiones:** ? Chernetidae- 6 ind., under stones in guano.

**Opiliones:** ? Cyphophthalmi - 1 ind. on clay, troglobite?

**Orthoptera:** Aemodogryllinae- 3 ind., > 50 observed at many places in the cave.

**Chilopoda:** Scutigerae - 4 ind.



**Coleoptera:** 20 ind. on guano.



**8. China**, Yunnan Province, Beihualin vill., Bao Shan Distr., Bian Fu Dong cave № 3 (Bat cave), N25.26111 E98.83943, alt. 987m, 30.10.2011, B. Petrov leg.

Large entrance part, very dry environment, bat guano.

**Araneae:** 3 ind., (? 2 species); cf. Pholcidae- 2 ind. (1 species).

**Blattodea-** 4 ind. (2 species).

**9. China**, Yunnan Province, Gaoligong Mt. Biosphere Reserve, Monmei River valley, Aouxia Dong cave, N24.77925 E98.92201, alt. 724m, 31.10.2011, B. Petrov leg.

Temperature 23,0°C. Very dry environment.

**Polydesmidae:** 1 ind., near the entrance, not a cave dweller.

**Araneae:** 6 ind., 1 species, > 20 observed.

**10. China**, Yunnan Province, Tengchong town, Lava tube Djin Dong cave, N25.03170 E98.43969, alt. 1642m, 1.11.2011, B. Petrov leg.

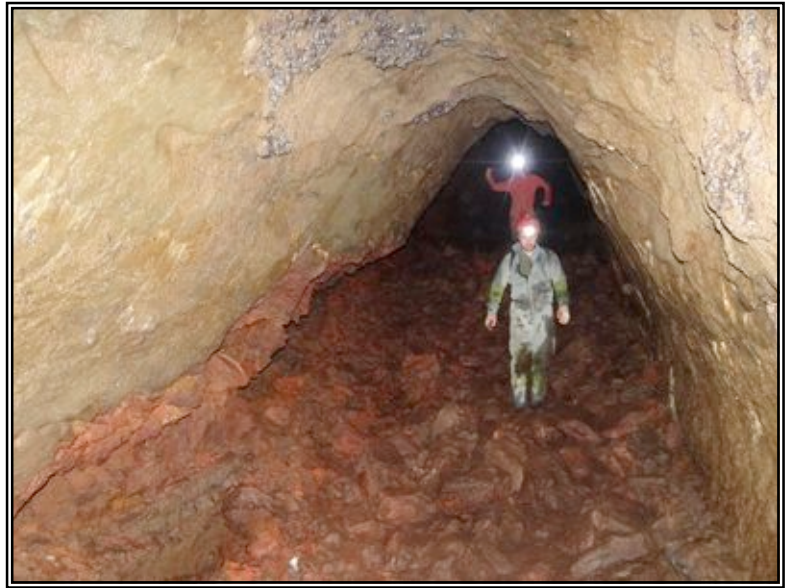


A lava tube with entrance around the middle of the passage. Temperature 15,3°C (in the middle of the upper part of the tube).

**Araneae:** 16 ind., ? 3 species, ? 1 troglobite?

**Opiliones:** ? Cyphophthalmi - 1 ind., on clay, troglobite?

**Opiliones:** Phalangidae- 1 ind. at the entrance, not a cave dweller.



**Chilopoda:** Scutigerae - 3 ind., 1 species, at the end of the downward part



**Collembola:** 4-5 ind., 1 species, in guano.

**Coleoptera:** Carabidae- 1 ind., not a cave dweller.

**Coleoptera:** Pselaphidae- 1 ind., rotten logs.

**Coleoptera:** Staphilinidae- 14 ind. (2 species), in guano.

**Coleoptera:** Family indet. - 1 ind., length about 3-4 mm, under stones.

**Orthoptera:** Aemodogryllinae- 7 ind., > 100 observed at many places in the cave.

**11. China**, Yunnan Province, Jiong Le vill., Jiu Tou town, Wu Shao Ming Dong cave, N25.45159 E98.60404, alt. 2092m, 2.11.2011, B. Petrov leg.

Vertical cave with underground river, some shallow pools, bat guano, clay, rotten logs. Temperature 11.3°C.



**Diplopoda:** Chordeumatidae- 4 ♀♀, troglobite,  
new species (length about 40 mm)  
(Pavel Stoev det. NMNHS)



**Gastropoda:** 1 ind., no a cave dweller.

**Opiliones:** Phalangidae- 3 ind. near the entrance, not a cave dweller.

**Araneae:** 2 ind. (2 species).

**Orthoptera:** Aemodogryllinae- 4 ind., > 100 observed in the cave.

**Coleoptera:** Carabidae- 1 ind., not a cave dweller.

**Coleoptera:** Heteroptera- 2 ind., not a cave dweller.

**12. China**, Yunnan Province, Gaoligong Mt. Biosphere Reserve, Tze Ze vill., Minguan town, Bien Fu Dong № 4 (Bat cave), N25.77548 E98.67402, alt. 2091m, 3.11.2011, B. Petrov leg.

Two entrances, underground river, lots of bat guano, small pools, clay, rotten logs.  
Temperature 11.7°C.

**Hirudinea**- 4 ind., > 8 ind. observed on the wall above the river



**Gastropoda** - 15 ind., on guano, troglobite? (length about 10-12mm).



**Opiliones**: Phalangidae- 3 ind. (1 species), near the entrance, not a cave dweller.

**Opiliones**: ? Cyphophthalmi - 2 ind., on clay, troglobite?

**Araneae**: 3 ind. (2 or 3 species).

**Pseudoscorpiones**: Chthoniidae- 1 ind., troglobite?

**Coleoptera**: Pselaphidae- 1 ind. under a stone.

**Coleoptera**: Family indet. - 1 ind., 3-4mm, under a stone near guano.

**Orthoptera**: Aemodogryllinae- 10 ind., > 100 observed.

**Diplopoda**: 45 ind., > 500 observed on clay and

**Coleoptera**: Carabidae- 2 ind., with eyes.



guano at many places (length about 50-60 mm).

**13. China**, Yunnan Province, Ermu vill., Kunming District, Da Shi Dong (Big Rock cave), N24.82090 E102.46514, alt. 1940m, 8.11.2011, B. Petrov leg.

The entrance of this cave is at 1.2 km from the entrance of Yenze Dong cave. Both caves are part of a common underground system.

**Hirudinea:** > 60 observed in a narrow passage with hundreds of bats passing through.

**Araneae:** 6 ind. (3 species) collected near the entrance.

**Opiliones:** Laniatores- 5 ind. found on rotten logs.



**Diplopoda:** ? Chordeumatida - ok. 15 ind., > 100 observed on clay (length about 10-14mm).

**Diplopoda:** 15 ind., > 50 observed on clay from the entrance to the end of the cave (length about 30 mm).



**Coleoptera:** Carabidae- 1 ind., (length about 6 mm).

**Orthoptera:** Aemodogryllinae- 1f, 3mm, > 100 m, at many places on the wall of the cave.

**LIST OF BATS (MAMMALIA: CHIROPTERA)**

|    |  |  |
|----|--|--|
| 1. | <b>China</b> , Yunnan Province,<br>Kunming District,<br>Yenze Dong cave (Swallow cave)<br>N24.81946 E102.47635, alt. 1970m,<br>24.10.2011, B. Petrov leg.  | <i>Rhinolophus</i> sp.<br>Chiroptera indet.  |
| 2. | <b>China</b> , Yunnan Province,<br>Dali District, Qing Hua Dong cave,<br>N25.44883 E100.54831, alt. 1974m<br>25.10.2011, B. Petrov leg.  | <i>Rhinolophus</i> sp.<br><i>Rousettus leschenaultii</i><br><i>Myotis ricketti</i><br><i>Pipistrellus</i> sp.  |
| 3. | <b>China</b> , Yunnan Province,<br>Gaoligong Mt. Biosphere Reserve,<br>Bin Men vill., Bao Shan Distr.,<br>Bian Fu Dong № 1 (Bat cave),<br>N25.09549 E98.82200, alt. 810m,<br>28.10.2011, B. Petrov leg.    | <i>Aselliscus stoliczkanus</i><br><i>Hipposideros armiger</i><br><i>Rhinolophus</i> sp.  |
| 4. | <b>China</b> , Yunnan Province,<br>Gaoligong Mt. Biosphere Reserve,<br>Hemu vill., Bao Shan Distr.,<br>Bian Fu Dong cave № 2 (Bat cave),<br>N24.98442 E98.80489, alt. 1296m,<br>29.10.2011, B. Petrov leg. | <i>Rhinolophus</i> sp.<br><i>Rhinolophus pusillus</i><br><i>Hipposideros armiger</i><br><i>Hipposideros pomona</i><br><i>Aselliscus stoliczkanus</i><br><i>Miniopterus</i> cf. <i>fuliginosus</i><br><i>Myotis</i> sp. |
| 5. | <b>China</b> , Yunnan Province,<br>Beihualin vill., Bao Shan Distr.,<br>Bian Fu Dong cave № 3 (Bat cave),<br>N25.26111 E98.83943, alt. 987m,<br>30.10.2011, B. Petrov leg.                                 | <i>Hipposideros armiger</i><br><i>Rhinolophus</i> sp.  |
| 6. | <b>China</b> , Yunnan Province,<br>Gaoligong Mt. Biosphere Reserve,<br>Monmei River valley, Aouxia Dong cave,<br>N24.77925 E98.92201, alt. 724m,<br>31.10.2011, B. Petrov leg.                             | <i>Hipposideros armiger</i>  |
| 7. | <b>China</b> , Yunnan Province,<br>Tengchong town, Lava tube Djin Dong<br>cave, N25.03170 E98.43969, alt. 1642m,<br>1.11.2011, B. Petrov leg.  | <i>Rhinolophus</i> sp.   |
| 8. | <b>China</b> , Yunnan Province,<br>Gaoligong Mt. Biosphere Reserve,<br>Tze Ze vill., Minguan town,<br>Bian Fu Dong № 4 (Bat cave),<br>N25.77548 E98.67402, alt. 2091m,<br>3.11.2011, B. Petrov leg.        | <i>Rhinolophus</i> sp.<br><i>Miniopterus fuliginosus</i>   |
| 9. | <b>China</b> , Yunnan Province,<br>Ermu vill., Kunming District,<br>Da Shi Dong (Big Rock cave),<br>N24.82090 E102.46514, alt. 1940m,<br>8.11.2011, B. Petrov leg.   | <i>Rhinolophus</i> sp.<br><i>Hipposideros armiger</i><br><i>Miniopterus fuliginosus</i>  |

**15 species  
5 Families**

*Rhinolophus yunanensis*

*Aselliscus stoliczkanus*

*Hipposideros armiger*

*Rousettus leschenaultii*

*Myotis ricketti*

*Hipposideros pomona*

*Miniopterus fuliginosus*

*Pipistrellus sp.*

*Rhinolophus cf. ssteno*

*Rhinolophus macrotis*

*Rhinolophus pusillus*

**Annex 1: List of the biospeleologically studied caves.**

| <b>№</b> | <b>Cave name</b>            | <b>Date</b>              | <b>GPS coordinates</b>  |
|----------|-----------------------------|--------------------------|-------------------------|
| 1.       | Aouxia Dong                 | 31.10.2011               | N24.77925<br>E98.92201  |
| 2.       | Bian Fu Dong № 1 (Bat cave) | 27.10.2011               | N25.09549<br>E98.82200  |
| 3.       | Bian Fu Dong № 2 (Bat cave) | 29.10.2011               | N24.98442<br>E98.80489  |
| 4.       | Bian Fu Dong № 3 (Bat cave) | 30.10.2011               | N25.26111<br>E98.83943  |
| 5.       | Bian Fu Dong № 4 (Bat cave) | 3.11.2011                | N25.77548<br>E98.67402  |
| 6.       | Fong Dong (Windy cave)      | 28.10.2011               | N24.91959<br>E98.81477  |
| 7.       | Jiu Xiang Dong Show Cave    | 23.10.2011               | N25.06692<br>E103.38310 |
| 8.       | Lava tube Djin Dong         | 1.11.2011                | N25.03170<br>E98.43969  |
| 9.       | Qing Hua Dong               | 25.10.2011               | N25.44883<br>E100.54831 |
| 10       | Wofosi Dong Temple Cave     | 26.10.2011               | N25.20849<br>E99.20022  |
| 11       | Wu Shao Ming Dong           | 2.11.2011                | N25.45159<br>E98.60404  |
| 12       | Yenze Dong (Swallow cave)   | 24.10.2011<br>08.11.2011 | N24.81946<br>E102.47635 |
| 13       | Da Shi Dong (Big rock cave) | 8.11.2012                | N24.82100<br>E102.46472 |

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**Biospeleological photos:** all by Boyan Petrov © except of Diplopoda: Callipodida specimen from Fong Dong Cave shot by Alexander Stoev ©

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<http://www.stenata.com>  
Outdoor Store



China Exploration &  
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