



6-1539 2692  
Republic of the Philippines  
Department of Environment and Natural Resources  
**PENRO MARINDUQUE**

November 29, 2022

**MEMORANDUM**

**FOR :** The Regional Executive Director  
DENR - MIMAROPA Region

**THRU :** The Assistant Regional Director  
for Technical Services

**FROM :** The OIC, Provincial Environment and  
Natural Resources Officer

**SUBJECT :** **REPORT ON THE CONDUCTED DETAILED CAVE  
ASSESSMENT IN THE PROVINCE OF MARINDUQUE  
FOR CY 2022**



Respectfully submitting the report on the conducted detailed cave assessment in Camarines Cave 2, located at Barangay Bintakay, Municipality of Mogpog, Marinduque. Please be informed that the Provincial Cave Assessment Team (PCAT) – Marinduque and the staff from Biodiversity Conservation Unit has completed the assessment and have recommended that the Camarines Cave 2 is under the classification of **Class II – Guided Tourism**. Please be informed further that the cave map is yet to be finalized.

For information and record.

  
**IMELDA M. DIAZ**



Republic of the Philippines  
Department of Environment and Natural Resources  
**PENRO MARINDUQUE**

November 28, 2022

**MEMORANDUM**

**FOR : The OIC, Provincial Environment and  
Natural Resources Officer**


**FROM : The Chief, Technical Services Division**

**SUBJECT : REPORT ON THE CONDUCTED DETAILED CAVE  
ASSESSMENT IN THE PROVINCE OF MARINDUQUE  
FOR CY 2022**

Respectfully forwarded is the report on the conduct of the detailed cave assessment for Camarines Cave 2, located at Barangay Bintakay in the Municipality of Mogpog in the Province of Marinduque.

For information and record.

*"For and in the absence of the Chief, TSD"*

  
**SIMEON R. DIAZ**  
LMO III

In-Charge, Office of the  
Technical Services Division



Republic of the Philippines  
Department of Environment and Natural Resources  
**PENRO MARINDUQUE**

November 28, 2022

**MEMORANDUM**

**FOR : The Chief, Technical Services Division**

**THRU : The Chief, Conservation and Development Section**

**FROM : The Staff, Biodiversity Conservation Unit  
Provincial Cave Assessment Team of Marinduque**

**SUBJECT : DETAILED ASSESSMENT FOR CAMARINES CAVE 2  
LOCATED AT BRGY. BINTAKAY, MOGPOG IN THE  
PROVINCE OF MARINDUQUE FOR CY 2022**

Relative to the activity under the Management of Caves and Cave Resources, please be informed that the undersigned had conducted a detailed cave assessment in Camarines Cave 2, located in Barangay Bintakay, Municipality of Mogpog, Province of Marinduque.

The cave assessment at Brgy. Bintakay was conducted last July 26, 2022 with the acknowledgment of the barangay officials and was enjoined by the members of Sangguniang Kabataan. The members of the Provincial Cave Assessment Team (PCAT) who has specializations in hazard and risk identification, biodiversity, and survey and mapping led the activity, while new members of the team from DENR-PENRO Marinduque personnel, assisted and observed the proper way of cave assessment. Since no geologist was present during the activity, the geological observations were patterned on the previous assessment conducted for Camarines Cave 1, the adjacent cave of Camarines Cave 2.

The Camarines Cave 2 was first discovered during the conduct of the cave inventory in the year 2020, also undertaken by the undersigned personnel and PCAT members. It was proposed for classification considering that at the time it was discovered, there are numerous swiftlets and bats seen flying in and out of the cave, and was first considered a good habitat for cave faunas. Classification of the cave is one way to implement a management plan to conserve and protect its rich biodiversity.

The cave has 28 stations with a total length of 133.55 meters from Station 0 to Station 4K, including the length of its side passages. In its five (5) chambers, speleothems such as stalactites, flowstones, columns, and a few draperies are featured.






Republic of the Philippines  
Department of Environment and Natural Resources  
**PENRO MARINDUQUE**

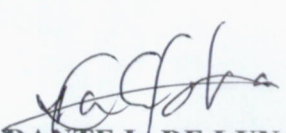
Also observed are faunas such as fruit bats and insect bats which were seen roosting and roaming, and swiftlets nesting inside the cave. There are also cave crickets, cave spiders, whiplike scorpions, ants, snails, and blue worms. Hermit crabs are also seen crawling in twilight areas of the cave. Aside from the small markings near Station 4K, no other graffiti were found in the innermost of the cave which is a good indicator that it was not yet exploited by other humans.

Because of the undisturbed and forested surface on top of the cave, continuous drippings help the build-up of calcites in the cave. With these features of the cave, the PCAT Marinduque recommends that it be classified under Class II – Guided Tourism. Once classified along with the Camarines Cave 1, it will be a good site for ecotourism and research studies of cave biodiversity in the Municipality of Mogpog.

Attached to this report are the Enhanced Assessment Form (Annex B) and the photos taken during the assessment. The map is yet to be finalized.

For information, record, and approval.


  
**DOREEN R. MASCAREÑAS**  
PCAT Member

  
**DANTE L. DE LUNA**  
PCAT Member

  
**RONALD S. ATIENZA**  
PCAT Member

  
**CORAZON R. PELAEZ**  
Biodiversity Conservation Unit

  
**RANDY R. PANTOJA**  
Biodiversity Conservation Unit

  
**DON GIBSON MERCADO**  
Monitoring and Enforcement Section

  
**ROBERT JOHNSON N. LARGA**  
Support Staff



**ENHANCED ANNEX B**  
**CAVE ASSESSMENT FORM**

Name of Compiler: **PCAT Marinduque**  
Date compiled: **November 28, 2022**  
Name of Cave: **Camarines Cave 2 (Buaya Cave)**  
Region: **MIMAROPA** Province: **Marinduque**  
Municipality/City: **Mogpog** Barangay: **Bintakay**  
Sitio/Purok: **Sitio Buaya**  
Size of the Area: \_\_\_\_\_ ha (area enclosed by the proposed boundary)  
Period of Assessment: **July 26, 2022**

**I. GENERAL INFORMATION**

**1. Evolution of the Cave**

Camarines Cave 2 is located at the extreme northwestern portion of the oldest limestone formation of the province dated by Gervasio (1970) and Montegi (1975) as part of Paleocene – Eocene Taluntunan – Tumicob Formation (Limestone Member) characterized and occurring as marbleized lenses intercalated with clastics. Later in 1986 Tumanda and others considered this formation as included in the Late Cretaceous, Hashimoto (1981) identified Globotruncana fossil assemblages indicative of the Late Cretaceous period, thereby labelled this limestone as carbonaceous capping of the Marinduque Basement rocks.

The limestone formation are bounded on its northwestern, northeastern margin by the Marinduque Basement rocks largely of spilitic, basic and andesitic flows intercalated with minor greywacke and siltstone of probable Cretaceous age, while on its south extremities is the intrusive biotite quartz diorite porphyry of Tertiary Middle Miocene period.

**2. Geographic location and description**

Coordinates: **13°29'29"N, 121°52'32"E**

Elevation: **111 masl**

Land Status (please check)

☒ Agricultural

☐ Timberland

☐ Mineral land

☐ Residential Others (specify \_\_\_\_\_)

☐ National Park

### 3. Accessibility

Generally, the cave site is accessible through land transport via secondary road from Mogpog Town Proper to Barangay Bintakay. The opening of the Camarines Cave 2, also known as Buaya Cave, can be found at the mountain top at Barangay Bintakay, Mogpog. It will take about 30 minutes of trekking from the barangay road to reach the opening. While from Balanacan Port, it would take a distance of almost 9 kilometers to the barangay road in Sitio Buaya; 2.6 kilometers from the national highway and 10.8 kilometers from the public vehicle terminal in the Municipality of Boac. If the route from the Masiga Airport in Gasan will be taken, 45-minute ride with a private vehicle or a distance of 22.7 kilometer is another suitable option. The cave can be explored within an hour.

### 4. Climatological data

Barangay Bintakay is under the Type III climate, which has no very pronounced maximum rain period, with a short dry season lasting only from one to three months, either during the period from December to February or from March to May. This climate type resembles Type I since it has a short dry season.

### 5. Existing land-use patterns in area adjacent to the cave.

LISTING BY TYPE	AREA (ha)	
	Adjacent to cave	Above the cave
Reforestation area	None	none
Reservation	None	None
Logging	None	None
Grazing/Pasture	None	None
Settlements	None	None
Mineral Extraction	None	None
Others	Agricultural	Agricultural

### 6. Demographic Information

Name of Barangay	Number of Household	Barangay Population	Number of families	Means of Livelihood
Bintakay	612	2,461		Employment, Farming, Fishing, Online Teaching

Source: Philippine Statistics Authority 2020 Census Population

### 7. Uses / Human Activities

7.1 Identify the current activities inside the cave

Type of Activity	Implementation period	Station/s Covered*	Implementing Agencies/Orgs.	Remarks
None	None	None	Not applicable	No current activities were observed/seen inside the cave

\* Refer to station in the cave map



## 7.2 Identify past uses/ activities

Type of Activity	Implementation period	Station/s Covered*	Implementing Agencies/Orgs.	Remarks
Birds nest collection	Many years ago	Not inventoried	Locals	anecdotal

\* Refer to station in the cave map

## 8. Physical Features

### a. Cave Map

Camarines Cave 2 in Barangay Bintakay, Mogpog has three (3) openings. Its main entrance is located at 13°29'29"N, 121°52'32"E that is 4.11 meters wide and 2.03 meters high. There are a total of five (5) chambers inside the cave. Combining the length of the main passage and sub-passages composed of 28 total stations, the cave has a total distance of 133.55 meters from the main entrance (Station 0) with 3.09 meters average ceiling height. Some of the cave's passages are tight and can be passed sideways and by crawling. The floor is generally composed of solid rocks, mud and guano. There are two (2) small water pools in the cave located in Stations 4C and 4K. In other parts, there are presence of plant roots. Column, stalactites and other formations are present in every chamber of Camarines Cave 2.

### b. Status of the Cave

- b.1 ( ) Pristine Cave (virgin or newly discovered cave; immensely decorated)  
 b.2 (✓) Intact (*State what probable factors could have worked for their protection*)

- (✓) difficult access  
 ( ) within protected area  
 (✓) inside private property

- b.3 (✓) Vandalized – *small writings were found on the wall between Stations 4H and 4I.  
 No other graffiti was found.*

- b.4 ( ) Exploited

- b.5 ( ) Claimant

- b.6 (✓) For status not included in the criteria  
 - *Stations 6 to 10I are undisturbed and guano deposits are still intact.*



## II. NATURAL FEATURES

### 1. Vegetative Cover (Surface; inside cave; enumerate plant species)

#### 1.1 Flora outside the cave

Local Name	Scientific Name	Uses	Importance/ Value	Conservation Status*	Stratification**	dbh	Remarks
Takip-asin	<i>Macaranga grandifolia</i>	ornamental	none	Not evaluated	Under story		Found above the entry point
Bugos	<i>Acalypha amentacea</i>	Multiple uses		Vulnerable	Emergent		Found near the exit point
Hanopol	<i>Poikilospermum Suaveolens</i>	medicinal		Not evaluated	Canopy		Found on the surface above the cave boundary
Fishtail	<i>Caryota mitis</i>	Multiple uses		Least concern	Emergent		Found near the exit point
Fortune Plant	<i>Draceana fragrans</i>	ornamental		Least concern	Understory		Found above the entry point
Alocasia	<i>Alocasia macrorrhizos</i>	ornamental		Least concern	Understory		Found above the entry point
Lipa	<i>Dendrocnide meyeniana</i>	medicine		Least concern	Understory		Found on the surface above the cave boundary
Hauili	<i>Ficus septica</i>	medicine		Least concern	Understory		Found near the opening of the cave
Tamayuan	<i>Strombosia philippinensis</i>	Multiple uses		Least concern	Understory		Found near the opening of the cave
Amuguis	<i>Koordersiodendron pinnatum</i>	medicine		Least concern	Understory		Found along the way to the cave
Usiw	<i>Arthrostylidium spp.</i>	Multipurpose		No status rank	Emergent		Found on the surface around the cave opening
Kawayan tinik	<i>Bambusa spinosa</i>	material		Least concern	Emergent		Found along the way to the cave
Himbabalud	<i>Barringtonia acutangula</i>	medicine		Not evaluated	Emergent		Found along the way to the cave
Igyu	<i>Pinus ponderosa</i>	Multiple uses		Least concern	Emergent		

\*Based on DAO 2007-01 or succeeding amendments

\*\*Emergent, canopy, understory, forest floor, etc.

#### 1.2 Flora inside the Cave (entrance to twilight zone)

Local Name	Scientific Name	Uses	Importance/ Value	Conservation Status*	Stratification	dbh	Remarks
Iumot	<i>Bryophyta sensu stricto.</i>	Multiple uses	None	No status rank	Under story		Found on the twilight zone of the cave intrance.

\*Based on DAO 2007-01 or succeeding amendments

## 2. Fauna

### 2.1 Fauna inside the cave (enumerate species):

#### a. Vertebrates

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
<i>Megachiroptera spp.</i>	Fruit bats	0-50	4E	Least concern	Flying inside
<i>Platymantis spp.</i>	Frog	1	7	Vulnerable	Alive
<i>Hipposideros sp.</i>	Insect bats	0-100	4A to 4D, 5, 7, 9	Least concern	Roosting season
<i>Aerodramus spp.</i>	Swiftlets	0-50	4H, 9 to 10	Least concern	Breeding
<i>Serpentes spp.</i>	Snake	0-10	7	n/a	Hatchlings only

\*Based on DAO 2004-15 or succeeding amendments

#### b. Arthropods and other invertebrates

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
<i>Rhaphidophoridae spp.</i>	Cave cricket	0-500	3 to 4, 9 to 10	Not evaluated	alive
<i>Damon diadema</i>	Whiplike scorpion	0-500	4 to 4E, 7 to 10	Not evaluated	alive
<i>Gastropoda spp.</i>	Gastropods	0-100	3 to 5, 4C, 7 to 10,	Not evaluated	Empty shells; small shells with alive slug inside
<i>Formicidae spp.</i>	Ants	0-1000	4C, 8 to 10	Not evaluated	Crawling in the guano deposit
<i>Pholcidae spp.</i>	Long-legged spider	1	9	Other threatened species	Seen on the floor and walls
<i>Perionyx excavatus</i>	Blue worm	0-10	4C, 6, 9	Not evaluated	Alive

\*Based on DAO 2004-15 or succeeding amendments

#### c. Guano characterization

Sample #	Species (e.g. fruit bat, insect bat, swiftlet)	Location (station #)	Depth	Area (m <sup>2</sup> )	Physical Characteristics (e.g. texture, consistency, dry or wet)	Relative age (old or new)	Other observations (presence of feathers, plant fibers)
1	Insect bat	3	0.5cm	0.5m <sup>2</sup>	dry	old	With roots
2	Insect bat	4B	1cm	0.5m <sup>2</sup>	moist	new	With fungi
3	Insect bat	4C	0.5cm	2m <sup>2</sup>	moist	new	With pool
4	Insect bat	4E	1cm	2m <sup>2</sup>	moist	new	With kawayan leaves traces
5	Insect bat	4G	0.5cm	0.5m <sup>2</sup>	moist	old	With roots
6	Insect bat	4J	0.5cm	0.5m <sup>2</sup>	moist	old	With flowing water
7	Insect bat	4k-1	0.5cm	1m <sup>2</sup>	moist	new	With fungi
8	Insect bat	7	0.5cm	1m <sup>2</sup>	dry	old	With roots



## 2.2. Fauna outside the cave.

Scientific Name	Common Name	Abundance (range)	Location (station #)	Conservation status*	Remarks
<i>Haliastur indus</i>	Lawin/Brahminy Kite	1-5	n/a	Least concern	Seen flying
<i>Nymphalidae spp.</i>	Butterfly	1-10	n/a	Critically endangered	seen
<i>Aerodramus spp.</i>	Swiftlets	0-10	n/a	Least concern	Captured and released for identification purposes
<i>Trigoniulus macropygus</i>	Millipedes	0-10	n/a	Not evaluated	Seen crawling outside the exit point

\*Based on DAO 2004-15 or succeeding amendments

## 3. Geology

### 3.1 Speleothems inside the cave.

Speleothem	Approximate No.	Zone		Remarks
		Twilight	Dark	
Dripstone and Flowstone Forms (gravity controlled)				
Stalactites	300-500	√	√	
Stalagmites	50-100	√	√	
Draperies	50-100	√	√	
Flowstone Sheets	100-300	√	√	
Columns	50-100	√	√	
Others				
Erratic Forms (crystal growth controlled)				
Shields	None			
Helictites	None			
Botryoidal Forms (popcorns, grapes, etc.)	50-100		√	
Anthodites	none			
Oulopholites (gypsum flowers)	none			
Moonmilk	none			
Others	none			
Sub-aqueous				
Rimstone dams (gour pools)	none			
Concretions of various kinds (limestone concretions e.g. cave pearls, iron, basalt)	50-100		√	
Pool deposits	5-10		√	
Crystal Linings	none			
Others	none			



### 3.2. Mineral deposits inside the cave.

Minerals	Location (station #)	Remarks
Aragonite	-	
Calcite	All throughout the cave	
Dolomite	-	
Huntite	-	
Hydromagnesite	-	
Magnesite	-	
Others	-	

### 3.3. Other geological features inside the cave.

- No other geological features were found inside the Labao Cave.

Features	Location (station #)	Remarks
Faults		
Joints		
Cracks		
Fossils (paleontological feature)		
Others		

## 4. Hydrology

### 4.1 Hydrological features inside the cave.

Feature	Location (station #)	Flow		Origin		Size/ Volume	pH	Temperature	Remarks
		Perennial	Intermittent	Natural	Man-made				
None	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

\*for rivers, indicate direction of flow relative to the entrance. Indicate location and reference points.

### 4.2 What are the hydrological features outside the cave?

Feature	Location (station #)	Flow		Origin		Size/ Volume	pH	Temperature	Remarks
		Perennial	Intermittent	Natural	Man-made				
none	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

5. **Cave Hazards.** Please indicate if any of the following are present. Please indicate location inside the cave.

Cave Hazards	Location (station #)	Remarks
bad air* (from guano, poor air circulation, low supply of oxygen )	none	
presence of swiftly running underground river system	none	
deep sumps or pools	none	Small pools only
flooding indications	none	
vertical pitches/entrances	1 to 2, 4J to 4K, 4M to 4L	
tight crawl ways/squeezes	2,6,4A, 4I	
presence of rock fall	8,4C to 4F, 4K, 4K-I	
Cavern roof collapse	none	
deep mud	none	
unstable flooring	none	
Sharp rocks	none	
Spalling**	none	
Heaving***	none	
Extremely cold temperatures	none	
Others – Flash flood	none	
Others – Slippery	none	
Others – Drop	none	

\*refers to the condition of air in caves characterized by low levels of oxygen, high levels of carbon dioxide and other hazardous gases such as methane. Low levels of oxygen and high levels of carbon dioxide in caves or certain cave passages pose dangers to the human body. Bad air is indicated by hyperventilation, increased heart rate, dizziness, dry acidic taste in the mouth, increased pulse rate, labored breathing, and headache. Annexes C to E provides general information on the relationship between caves and levels of CO<sub>2</sub> and O<sub>2</sub>.

\*\*refers to breaking down or chipping off of rock faces/surfaces due to stress

\*\*\*refers to a process where cracks form in the rock due to subsidence

### III. ANTHROPOLOGICAL FEATURES

Are there indigenous peoples (IP's) or settlers living within the general location? If yes, then specify the name of the IP and other information listed below.

- There are no indigenous people or settlers near/around Camarines Cave 2 or within Barangay Bintakay.

IP	Approximate Population	Livelihood Activities	Traditional Uses/ Cultural Activities
none			



#### IV. ARCHAEOLOGICAL FEATURES

Are there artifacts and/or ecofacts on the present floor area of the cave, rock shelter or overhang?

\_\_\_\_\_ Yes ☒ None If yes, indicate location/s (station #/chamber)

*No artifacts were found inside the Camarines Cave 2.*

Artifacts	Location (station #)	Remarks
Stone tools (flaked)		
Stone tools (polished)		
Shell tools		
Tradeware ceramics (porcelain, stoneware)		
Pottery (earthenware)		
Pottery (earthenware with designs)		
Metal implements		
Wooden coffins		
<b>Ecofacts</b>		
Fossils		
Human bones		
Animal bones		
Wood		
Shells (land)		
Shells (freshwater)		
Shells (marine)		
<b>Artworks</b>		
Charcoal drawings		
Hematite paintings		
Engraved artwork		
<b>Others</b>		

#### V. THREATS, PROBLEMS AND POSSIBLE SOLUTIONS

Threats/Problems	Current	Potential	Possible solutions	Remarks
Deforestation		/	Reforestation	
Agriculture	/		Sustainable farming	
Urbanization	none			
Industrialization	None			
Tourism and Recreation		/	Management plan; IEC	
Chemical Waste	none	none		
Water Exploitation (dams, groundwater pumping, inundation)	none			
Treasure hunting	none	/	Law Enforcement (Cave Act)	
Used by insurgents	None	none		
Others	None	none		



## VI. POTENTIAL USES OF THE CAVE

Potential Uses	Remarks
Scientific Research	Study of bats and blue worms
Tourism and Recreation	Guided tourism
Exploration	For further exploration
Others	none

## VII. RECOMMENDATIONS

**The PCAT – Marinduque recommends that the cave is under the classification of Class II – Guided Tourism.**

Camarines Cave 2 has more features like various speleothems and species of bats, than its adjacent cave, Camarines Cave 1, which was assessed in the year 2015 and was also recommended under Class II. With the rich biodiversity of the cave and being within the private land, Camarines Cave 2 is also recommended to be under Class II – Guided Tourism. Once classified, the two adjacent caves will be under proper conservation and protection with the management plan that may be prepared by the LGUs, academes and other agencies, which will be led by DENR PENRO Marinduque.

### Prepared by:

Assessment Team Members

Doreen R. Mascareñas, Ph.D. / Faculty, School of Agriculture, Marinduque State College / 09673067582  
Ronald S. Atienza / Administrative Aide VI/Staff, MDRMO – LGU Mogpog / 09178203226  
Dante L. De Luna / Economist II / PG – ENRO / 09776694435  
Don Gibson Mercado / Forester I / PENRO Marinduque  
Randy R. Pantoja / Forest Technician I / PENRO Marinduque / 09062820192  
Corazon R. Pelaez / Forest Technician I / PENRO Marinduque / 09150514266  
Robert Johnson N. Larga/Technical Support Staff/PENRO Marinduque / 09277387148

### Concurred by;



**IMELDA M. DIAZ**

Chairperson, Provincial Cave Committee

**PHOTOS TAKEN DURING THE  
DETAILED ASSESSMENT IN  
CAMARINES CAVE 2**





*The cave assessment team of Camarines Cave 2 consisting of PCAT Members, DENR – PENRO Marinduque personnel and member of Sangguniang Kabataan of Bintakay*



*Conduct of measuring the distance per station, readings of inclination and orientation of the cave, and recording the cartography of the cave features*



## FAUNAS INSIDE THE CAVE



Frog (*Platymantis* spp.) found at Station 1



Blueworm found at Stations 4C, 6 and 9



Snake hatchlings found at Station 7



A resting fruit bat at Station 4E



Long-legged spider



Whiplike scorpion



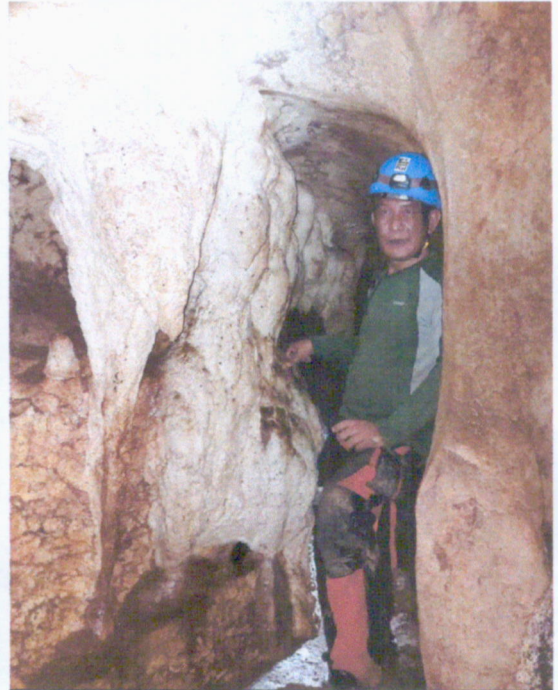
Nesting Swiftlets at Station



## SPELEOTHEMS INSIDE THE CAVE



STALACTITES



COLUMN



FLOWSTONE



STALAGMITE



DOG TEETH



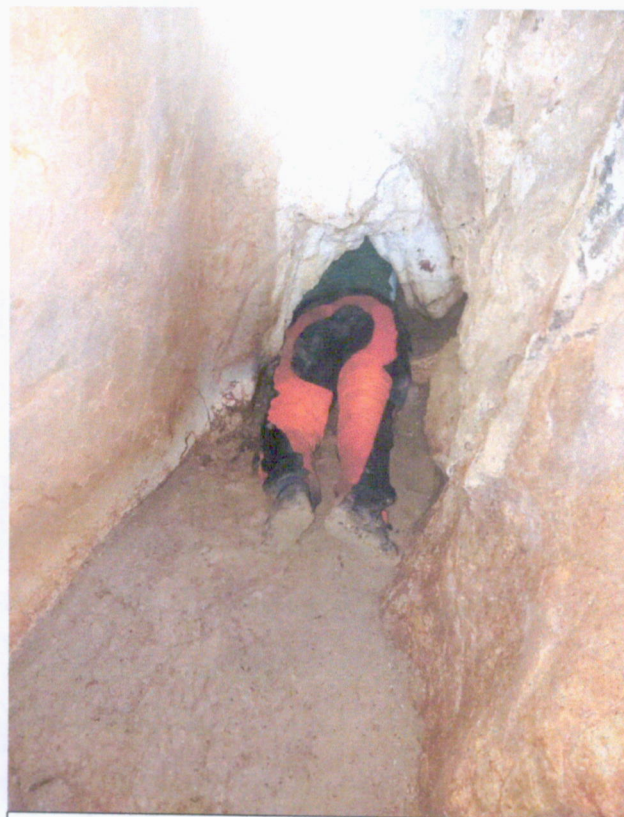
## HAZARDS INSIDE THE CAVE



VERTICAL PITCHES/ENTRANCES



ROCK COLLAPSE



TIGHT CRAWL WAYS