

PRELIMINARY STUDY ON BIODIVERSITY OF CAVE SPIDER IN THE PHONG NHA - KE BANG NATIONAL PARK, QUANG BINH PROVINCE

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INTRODUCTION

The Phong Nha - Ke Bang National Park (PNKBNP) is situated in Quang Binh province of the north central Vietnam. It was inscribed on the UNESCO World Heritage list in 2003 for its outstanding geomorphological features. The central park area is approximately 860 km² and contains over 300 known caves. The caves in the area were first explored and mapped in 1990 by a British expedition and this has continued to the present, with expeditions approximately every second year. This has resulted in 17 of the known caves in the Phong Nha area, and 3 in the Ke Bang area being mapped, but to date the fauna has not been investigated, despite the high likelihood of endemic cavernicolous faunal elements. The current preliminary survey aims to provide a basis for future biological surveys in the Phong Nha - Ke Bang World Heritage Area, Vietnam. The current preliminary survey aims to provide an initial overview of the spider fauna in two cave systems: Phong Nha cave system (Phong Nha cave, Tien Son cave), and Dark cave.

SURVEY METHODS

Surveys for spider fauna in cave system use many different techniques (Curtis, 1980 and Millar, 2000). These methods include:

- Pitfall traps;
- Hand foraging (using forceps and paintbrushes to actively collect observed spider fauna);
- Litter sieving.

The field component of the survey was conducted during between April and May 2010. The sites chosen are listed below:

1. Phong Nha Cave - Royal Grotto
2. Phong Nha Cave - Fairy Grotto
3. Phong Nha Cave - Bi Ki Grotto
4. Phong Nha Cave - River Banks
5. Phong Nha Cave - Rockpile at end of 1st river section
6. Tien Son Cave - Tourist section
7. Tien Son Cave - Wild section
8. Dark Cave - Twilight Zone
9. Dark Cave - Transition Zone

All adult spiders were identified to morpho - species. The further works of taxonomy will be carried out at a later date.

RESULTS AND DISCUSSION

The preliminary study of the cave fauna from the PNKBNP collected 225 individual specimens, 39 species from the three caves examined (Table 1). Five species are common across the three caves. The Dark Cave was found to contain many species that were not recorded from either Phong Nha or Tien Son caves.

The main differences in spider faunal assemblage shown by the current preliminary survey are the dramatic differences in spider faunal diversity and abundance between areas used by tourists and the wild sections of the same caves. Phong Nha cave contains three tourist sections, Bi Ki Grotto, and the contiguous Royal and Fairy Grottos near the cave entrance. These areas are extremely heavily impacted by foot traffic over every horizontal surface, with no defined paths through much of the tourist route. This has resulted in limited habitat remaining that is capable of supporting cave spider fauna. The large amount of rubbish in the tourist sections, and the presence of rubbish bins within the caves has also affected the assemblage of cave spider fauna in these areas. The majority of spider fauna recorded from the Fairy and Royal Grottos are relatively common species found in several other areas.

The presence of bins within the caves also affects the spider diversity, with virtually all the species recorded from the tourist section of Tien Son cave being located under or near bins. This fauna is likely to occur in much higher abundances than natural cave levels due to the additional food resources available. The lack of these food sources in the wild section of Tien Son cave resulted in much lower populations, or a complete absence, of several spider species.

The cave spider fauna recorded from the Dark cave showed the greatest difference to both Phong Nha and Tien Son caves, due to both the different cave morphology and the absence of tourism within the Dark cave. While the overall species diversity was not significantly greater, the species recorded from Dark cave were mostly not recorded from either of the other caves surveyed. It is impossible to confirm the cause of this difference with the current preliminary data, however, it is likely to be a combination of both natural faunal compositions and absence of impacts to the available habitat within the Dark cave compared with Phong Nha and Tien Son caves.

People going off the designated path have the potential to damage cave habitats. People leaving rubbish in the cave, spitting, toileting in the cave all create artificial food sources which attract outside fauna.

There is a little to no enforcement of the park rules about eating, drinking and smoking in the caves. This is resulting in large amounts of rubbish being found throughout the cave ranging from plastic drink bottles, fruit juice cartons, beer and softdrink cans, footwear, clothing, fruit peel, eggshells, and peanut shells. These artificial food sources have the potential to attract pest species into the caves, artificial

altering community structures and greatly impacting on the natural species diversity in the cave systems.

The cave survey found an evidence of rat presence in Tien Son Cave. It is obvious that eating and drinking in the caves is a huge problem and needs to be stopped. Rubbish bins are in place throughout Tien Son Cave and Phong Nha Cave and are to a point being used but they in themselves act as an artificial food source as the spider faunal assemblage found around the base of one showed. It is highly recommended that the rubbish bins should be removed from the cave, an extensive cave clean up is done to remove rubbish that has been disposed of inappropriately throughout the caves and the rules of not eating and drinking within the cave are strictly enforced, as that of no smoking.

CONCLUSION

The preliminary study of the cave fauna from the Phong Nha - Ke Bang collected 225 spiders, representing at least 39 species from the three caves examined. The Dark Cave was found to contain many species that were not recorded from either Phong Nha or Tien Son caves.

The main differences in spider assemblage shown by the current preliminary survey are the dramatic differences in faunal diversity and abundance between areas used by tourists and the wild sections of the same caves. The majority of fauna recorded from the Fairy and Royal Grottos are relatively common species found in several other areas.

Table . Species diversity and abundance of spider from three caves in the Phong Nha - Ke Bang National Park, Quang Binh Province, Vietnam

	Phong Nha Cave					Tien Son Cave		Dark Cave	
Morpho-species	Royal Grotto	Fairy Grotto	BI KI Grotto	River Edge	Rockpile	Tourist Section	Wild Section	Twilight Zone	Transition Zone
sp. 1						2			
sp. 2								1	
sp. 3	12							4	
sp. 4								2	
sp. 5			1						
sp. 6									4
sp. 7	5		3	5	11	2	2	2	
sp. 8							4		
sp. 9									6
sp. 10					1				
sp. 11	1	2							

	Phong Nha Cave					Tien Son Cave		Dark Cave	
Morpho - species	Royal Grotto	Fairy Grotto	Bi Ki Grotto	River Edge	Rockpile	Tourist Section	Wild Section	Twilight Zone	Transition Zone
sp. 12	1	1	3	9	1	3	2	1	
sp. 13									12
sp. 14	2					1		1	
sp. 15					1				
sp. 16	4	1	1	3	2	1	3		3
sp. 17							3		
sp. 18						1			
sp. 19					5				
sp. 20							3		
sp. 21									6
sp. 22									2
sp. 23							2		
sp. 24					2				7
sp.25							3		
sp.26								2	
sp.27						2	1		1
sp.28				9	1	7	11	1	2
sp.29									2
sp.30				2					
sp.31	1		2	2					
sp. 32		1				2			
sp. 33						1			
sp. 34									1
sp. 35						4	2		
sp. 36		2							
sp. 37		3							
sp.38		1							
sp. 39		2							

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TÓM TẮT

NGHIÊN CỨU SƠ BỘ ĐA DẠNG NHỆN TRONG HANG ĐỘNG TẠI VƯỜN QUỐC GIA PHONG NHA - KÈ BÀNG, TỈNH QUẢNG BÌNH

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Viện Sinh thái và Tài nguyên sinh vật

Ba mươi chín (39) loài nhện đã được xác định tại ba hang động (Động Phong Nha, Động Tiên Sơn, Hang Tối) thuộc Vườn Quốc gia Phong Nha - Kẻ Bàng.

Những khác nhau trong sự quản lý của khu hệ nhện sống hang động là những khác nhau ý nghĩa trong đa dạng động vật giữa khu vực phát triển hoạt động du lịch và khu vực tự nhiên trong cùng một hang động.

Sự hiện diện của những thùng rác cũng ảnh hưởng đến đa dạng của khu hệ động vật trong hang động, hầu hết các loài động vật không xương sống ghi nhận được khu vực dành cho du lịch hoặc ở bên cạnh các thùng đựng rác đều là các loài phổ biến bên ngoài hang động chứ không phải các loài chuyên sống trong hang động.

Hệ thống hang động của Phong Nha - Kẻ Bàng bao gồm của quần xã động vật không xương sống đa dạng và rất quan trọng. Kết quả nghiên cứu sơ bộ này chỉ đưa ra hiểu biết nhỏ trong kho tàng sinh học của vùng di sản thiên nhiên thế giới giàu có và độc nhất này, tiếp tục khám phá trong tương lai là việc làm hết sức cần thiết.