ACTA CARSOLOGICA	33/1	21	311-317	LJUBLJANA 2004

COBISS:1.03

AN INTRODUCTION TO SOME CAVE FAUNA OF MALAYSIA AND THAILAND

PRISPEVEK K POZNAVANJU JAMSKEGA ŽIVALSTVA V MALEZIJI IN NA TAJSKEM

LIZ PRICE[1]

[1] Le Chateau II, B-7-4, Lorong Syed Putra Kiri, 50460 KUALA LUMPUR, MALAYSIA
e-mail: lizprice@hotmail.com

Prejeto / received: 14. 12. 2003

Abstract UDC: 551.44:59(5-11)

Liz Price : An introduction to some cave fauna of Malaysia and Thailand

Tropical caves of southeast Asia are often home to a wide range of cave fauna, ranging from microscopic invertebrates through to snakes and bats at the top of the food chain.. This food chain is dependant on the bats. Larger mammals, such as porcupine, goats and elephants may visit caves for shelter or food. Animals such as bats are useful to man, whilst the nests of cave swiftlets are harvested and fetch high prices on the market. Studies on cave fauna began at the end of the 19th century in Malaysia and Thailand.
Key words: southeast Asia, Malaysia, Thailand, fauna, invertebrates, bats, swiftlets

Izvleček UDK: 551.44:59(5-11)

Liz Price : Prispevek k poznavanju jamskega živalstva v Maleziji in na Tajskem

V jamah tropske jugovzhodne Azije pogosto prebivajo zelo različni predstavniki jamske favne, od mikroskopskih nevretenčarjev do kač in netopirjev na vrhu prehranjevalne verige. Ta prehranjevalna veriga je odvisna od netopirjev. Večji sesalci, kot so ježevci, koze in sloni tudi občasno iščejo v jamah zatočišče ali hrano. Živali, kot so netopirji, so človeku koristne. Gnezda jamskih hudournikov, ki jih ljudje nabirajo, dosegajo na trgu visoko ceno. S preučevanjem jamskega živalstva so se v Maleziji in na Tajskem pričeli ukvarjati konec 19. stoletja.
Ključne besede: jugovzhodna Azija, Malezija, Tajska, jamska favna, nevretenčarji, netopirji, hudourniki.

In temperate caves, especially in Europe, it is not common to see much cave fauna. Most of the fauna is restricted to the threshold zones, where invertebrates such as insects, and possibly small mammals may be seen. Deep inside the cave there may be a few bats. In contrast, tropical caves of southeast Asia often abound with life.

This cave fauna ranges from tiny microscopic organisms right through to elephants. However not all these creatures are troglobites (cave dwellers). Some are troglophiles (animals which are found in the caves but can also live outside), and others are trogloxenes (cave dwellers which go outside to feed). Cave visitors include people and other large mammals such as elephants, goats and porcupine.

Studies on cave fauna in the southeast Asian region began at the end of the 1800's. Ridley wrote about the white cave snake he saw in Malaysia (Ridley 1898), and at the same time Annandale was doing studies in Thailand (Annandale 1900). Dover et al made the first comprehensive study on invertebrates in Dark Cave at Batu Caves in the 1920's (Dover 1929).

The cave food chain is quite complex but everything ultimately depends on the bats for survival. There is no sunlight in caves, so no photosynthesis can take place therefore plants cannot grow. Bats (and cave swiftlets) are the only creatures which regularly go outside the cave to feed. There are two types of bats, the insect eaters and the fruit bats. They leave the cave at night to feed on insects, fruits, pollen, and it is their resulting guano or excreta which deposited in the cave supports the whole food chain, from the smallest bugs through to the cave dwelling snake.

The guano of the fruit bats is very nutritious compared to that of the insect eaters. This can easily be seen just by looking at the life in the guano: the rich fruit bat guano found especially near the cave entrances and daylight areas is absolutely heaving with life, much more so than the guano from the insect eating bats. So the fruit bats in particular support the invertebrates.

Bats are very useful to Man as they help pollinate certain tropical fruit crops, especially those which flower at night. And they also help control the insect pests. In Deer Cave in Mulu National Park in Malaysia, an estimated one or two million (maybe more) bats live in the one cave. Each night they fly out to feed, each one eats at least 10g of insects during a night of hunting, so this is at least 10,000 kg of insects consumed in a single night. This results in many kilogrammes of guano falling to the floor each day (Price 1999). Deer Cave is particularly rich in invertebrate life.

Bats can be very fussy about which cave to live in, and if conditions are not quite right they won't stay. A cave without bats generally means no other animals will be found. The guano is home and food to countless creatures, including flies, beetles, bugs, collembola, millipedes, springtails, cockroaches, worms, mites and moths. These animals are in turn fed upon by the cave crickets, centipedes, scorpions, whip scorpions and spiders. And these provide food for small mammals, frogs and toads. Animal carcasses, especially those of bats, are scavenged almost immediately, and soon nothing remains except for the bare skeleton. The bats and the cave swiftlets have parasites such as mite, chiggers, ticks, fleas and flies. Particularly noticeable in Deer Cave, Mulu, are the Hairy Earwigs which live on the Naked Bats, feeding on oils produced by the bats to protect their skin.

The insect troglobites often have elongated legs, as well as very long feelers to navigate and to hunt their prey. The legs and feelers can be several times longer than the body, especially with the long legged centipedes, the cricket and the whip scorpion. Some invertebrates such as the trapdoor spider of the *Liphistius* species may be endemic to just one cave, for example *Liphistius batuensis* is only found in Batu Caves in Malaysia and nowhere else. Some caves are being invaded by external

species, for example, the cave cockroach *(Pycnoscelus striatus*), at Batu Caves seems to be less numerous now, whereas the domestic types of cockroach *(Periplaneta spp.)* are on the increase (Price & Steiner 1999). The Periplaneta cockroaches are found in many caves throughout the region.

The water dwellers such as debris feeders, larvae and flat worms are eaten by snails, fish, and crabs. Catfish can be seen in some cave rivers, particularly in caves in Thailand. There are various species of cave dwelling white crabs, especially in Mulu and Bidi. Sometimes terrapins and turtles can be seen in caves.

Virtually all the tropical cave fauna has retained eyes and pigment, it is rare to find blind, white creatures, like the Proteus salamander in Slovenia. The only white troglobite is the cave crab, which is eyeless, and found in Mulu (Price 1999). However the Bidi Cave crabs (also in Sarawak) still have eyes and pigments. The blind crabs along with the millipedes and pseudoscorpions are apparently the only troglobites without eyes. All the others have reduced eyes and pigments. The cave racer snake in Peninsula Malaysia is a creamy white colour, but in Borneo it is a much darker grey colour with a more defined pattern.

At the top of this whole food chain is the cave snake. The cave racer *(Elaphe taeniura)* is the only snake which is adapted to spend its whole life in a cave, feeding exclusively on bats and swiftlets. The racer can climb walls to reach its prey, where it will rest with its head hanging out waiting for its prey to fly past. It then constricts its victim before swallowing it (Price 1998a). Another expert climber is the egg-eating cricket, which will climb to reach swiftlet eggs and chicks left unguarded in nests. Other types of snakes are occasionally found in caves, such as pythons and rat snakes but these have generally come in by accident and usually cannot survive.

Animals using caves as shelters include small forms such as moths, fireflies and sand flies. Potter wasps and hornets may build nests at cave entrances. Larger animals that visit caves include amphibia, rodents, porcupines, pigs, deer, mountain goat and elephants.

Unfortunately man is upsetting the balance of the cave ecosystem. Bat guano is collected from many caves for use as a fertiliser. This practice has been going on for well over a hundred years, and many archaeological remains have been lost through indiscriminate collection. In some caves pits over 2-3m deep can be seen where the guano has been removed. Cockroaches are also taken from caves by fishermen for bait.

The nests of the cave swiftlets have been harvested by man for centuries to make birds nest soup. The edible nests fetch a high price on the market: 1 kg of white nest costs more than US$1000 (Lim & Cranbrook 2002). In the past the nests were collected all year round, resulting in a depletion of swiftlet numbers. Now in many caves in Borneo the harvest is restricted to two or three times a year, to give the bird population a chance to recover. During the removal of the nests, baby birds sometimes fall to the floor where they die, and this is another factor which will lead to the decline of the species.

Although many tropical caves are rich in cave fauna, there seems to be a decline in numbers of species over the years, particularlyof bats (Kock et al 2000). This is possibly because of the increased development and industralization in areas around the caves. The bats have further and further to travel to find food, apart from the problems of widespread use of insecticides and other chemcials and pollution. And limestone hills are being quarried, resulting in the loss of the associated flora and fauna. But it is fascinating to see such a wide range of fauna in many caves of South East Asia.

Fig. 1: Bats are often found in tropical caves.

Fig. 2: The Periplanta species of cockroach has made its home in caves.

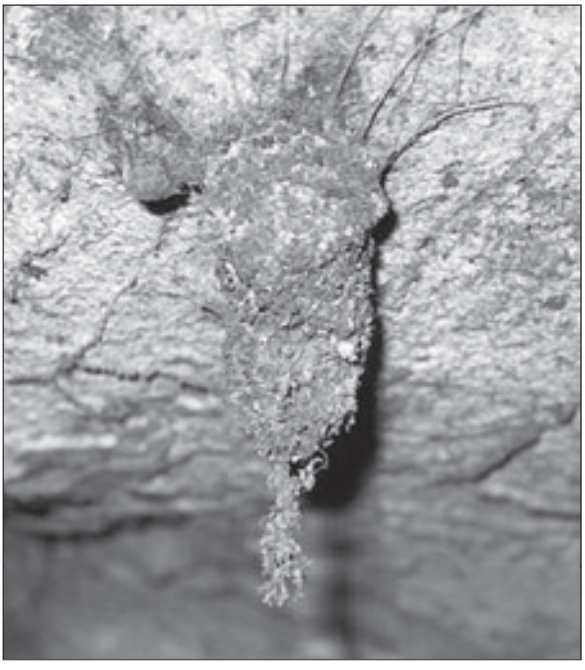

Fig. 3: The nest of the trapdoor spider, Liphistius batuensis.

Fig. 4: Millipedes are often seen scavenging on the guano.

REFERENCES

Annandale, Nelson. (1900) Notes on Orthoptera in the Siamese Malay states. The Entomologist's Record & Jnl of Variation, Jan-Dec, XII, p75-77, 95-97.

Annandale, N & Robinson, H.C. (1903) Anthropological & zoological results of an expedition to Perak & the Siamese Malay states 1901-1902. Fasciculi Malayenses, 2(1).

Dover, C. et al (1929) The fauna of Batu Caves. Jnl. Federated Malay States Museum 14:325-387.

Kock, D; Altmann, J & Price, L (2000) A fruit bat new to West Malaysia: Rousettus leschenaultii (Desmarest 1820) in Batu Caves. Malyasian Nature Jnl, 54(1)63-67.

Lim Chan Koon & Earl Of Cranbrook (2002) Swiftlets of Borneo. Natural History Pubs, Jan, 171pp (132 figs, maps).

Mcclure, H.e., Lim Boo Liat & Winn, Sarah E. (1967) Fauna of the Dark Cave, Batu Cave. Pacific Insects 9(3)399-428.

Price, Liz (1998a) Cave fauna. The cave racer. International Caver, 22:16-18.

Price, Liz (1998b) New species of cave spider. IC, 23:41.

Price, Liz (1999) Cave fauna of Mulu. Sarawak Gazette, CXXVI (1539), June, p35-42, photos.

Price, Liz (2000) Bats really. Malaysian Naturalist, 54(2)40-43 (5 phot.).

Price, L & STEINER, H (1999) Periplaneta australasia (Blattidae), a new record for Dark Cave, Batu Caves. MNJ, 53(4)341-344, (1 plate).

Ridley, H. N.(1898) The white snake of the Selangor caves. JSBRAS July, 31:99-101.

Shaharin Yussof (1988) Some invertebrates from Batu Caves. Nature Malaysiana 13 (2)24-31.

Shaharin Yussof (1997) The natural and other histories of Batu Caves. Malaysian Nature Soc.(KL), i-ix, 1-55, (46 plates).