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First reported case of cannibalism in *Lychas aberlenci* Lourenço, 2013 from the rainforest of Laos (Scorpiones: Buthidae)

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Abstract: A first case of cannibalism is reported from the field for *Lychas aberlenci* Lourenço, 2013 in the rainforests of Khammouane Province in Laos. This species continues to be encountered only rarely, but it seems to have an exclusive arboreal behaviour in its natural habitat.
Key words: Scorpiones, Buthidae, *Lychas*, cannibalism, rainforest, Laos.

Primera observación de canibalismo en *Lychas aberlenci* Lourenço, 2013 del bosque tropical de Laos (Scorpiones: Buthidae)
Resumen: Se presenta el primer caso de canibalismo en el campo de *Lychas aberlenci* Lourenço, 2013, observado en el bosque tropical de la provincia de Khammouane, en Laos. La especie sigue detectándose sólo en contadas ocasiones, pero sí que parece tener una conducta exclusivamente arbórea en su medio natural.
Palabras clave: Scorpiones, Buthidae, *Lychas*, canibalismo, bosque tropical, Laos.

Introductión

Cannibalistic behaviour is generally considered as rather common in many scorpions communities (Polis & McCormick, 1987; McCormick & Polis, 1990). Nevertheless, most well observed cases in the field are from desert scorpions in North America (Polis & McCormick, 1987; McCormick & Polis, 1990). A number of other reports exist for species from distinct habitats but most have been observed under laboratory conditions where different factors (e.g., stress) can lead to this behaviour (McCormick & Polis, 1990). In fact, many scorpion species show different degrees of cooperation and even of social behaviour (Lourenço & Cloudsley-Thompson, 2010, 2011; Polis & Lourenço, 1986). As for cannibalism, as stated by Cloudsley-Thompson (1998) 'Unlike predation, cannibalism usually represents more than just the acquisition of food resources and no general theory predicting its distribution, forms and consequences has yet been formulated.' Since observed cases of cannibalism remain rare among species living in rainforests, we herein report about such beha-viour in *Lychas aberlenci* a buthid scorpion from Laos.

This species was discovered during a Canopy Operation conducted by several ecologists during the year 2012. All scorpions collected belonged to the family Buthidae C. L. Koch, 1837 and to the genus *Lychas* C. L. Koch, 1845. All specimens, with one exception, proved to belong to *Lychas mucronatus* (Fabricius, 1798), a common species present in Asia and Southeast Asia. The exceptional individual, an adult male, subsequently was described (Lourenço, 2013) as *L. aberlenci*. Whereas *L. mucronatus* proved to be a typical epygean species, abundant both in the canopy and at the ground level, *L. aberlenci* appeared to be exclusively arbo-real.

Recent field work in Khammouane Province, Laos revealed further findings of *L. aberlenci* nearby the type locality, supporting the hypothesis of an exclusively arboreal species. In addition, we herein provide the first proof of cannibal-listic behaviour in the species in its natural habitat.

Material and Methods

Field work in the forest around Na Kham Village, Mahakay District, Khammouane Province, Laos (17°27.200-313'N, 105°00.27-225'E, 157 m a.s.l.) was conducted by Vinh Quang Luu on 26 February 2016 and by Truong Quang Nguyen and Thomas Ziegler on 2 December 2016. Additional scorpion surveys took place in Khammouane's Ban Soc region (17°28.723'N, 105°36.241'E, 171 m a.s.l.) on 3 December 2016 by Truong Quang Nguyen and Thomas Ziegler.

A total of three specimens of *Lychas aberlenci* from Khammouane Province were deposited in the Muséum national Histoire naturelle, Paris, France. This includes both the predator and cannibalized specimen.

Abbreviations are as follows: a.s.l. = above sea level

Results

In 2016, three new specimens of *L. aberlenci* were discovered in the forest around Than Cave, nearby Na Kham Village, Mahakay District, Khammouane Province. This locality is relatively close to the type locality of *L. aberlenci*. All three specimens were collected at night from the trunks of trees located near to the entrance of Than Cave (Fig. 1). All three specimens proved to be males. The largest one, an adult male, was observed and photographed feeding on a conspecific male juvenile (Fig. 2).

Subsequent inventory work, performed in the same region in December 2016, revealed that the most abundant species in this scorpion community is *Lychas mucronatus*. During a night excursion, conducted on 2 December 2016, during which the ground, trees, leaves, bushes and karst cre-vices were surveyed from about 21:00 to 23:00 o'clock, the only *Lychas* representative found was *L. mucronatus*: the first one actively running on the ground on a forest trail, another one sitting on the tree trunk, about 40 cm above the ground, and a third one on a tree, ca. 180 cm above the ground (Fig. 3). That *L. mucronatus* is the dominant scorpion species in the region, was also demonstrated by a day excursion on the next day, on 3 December 2016, where eleven adult individuals were found within ten minutes only on a forest path transect of 20 m in the forest of Soc Village, likewise located in Khammouane Province. These *L. mucronatus* individuals were found under the bark of cut trees, with up to four individuals together in close proximity (few centimetres distance only) to each other under the same tree bark areas.

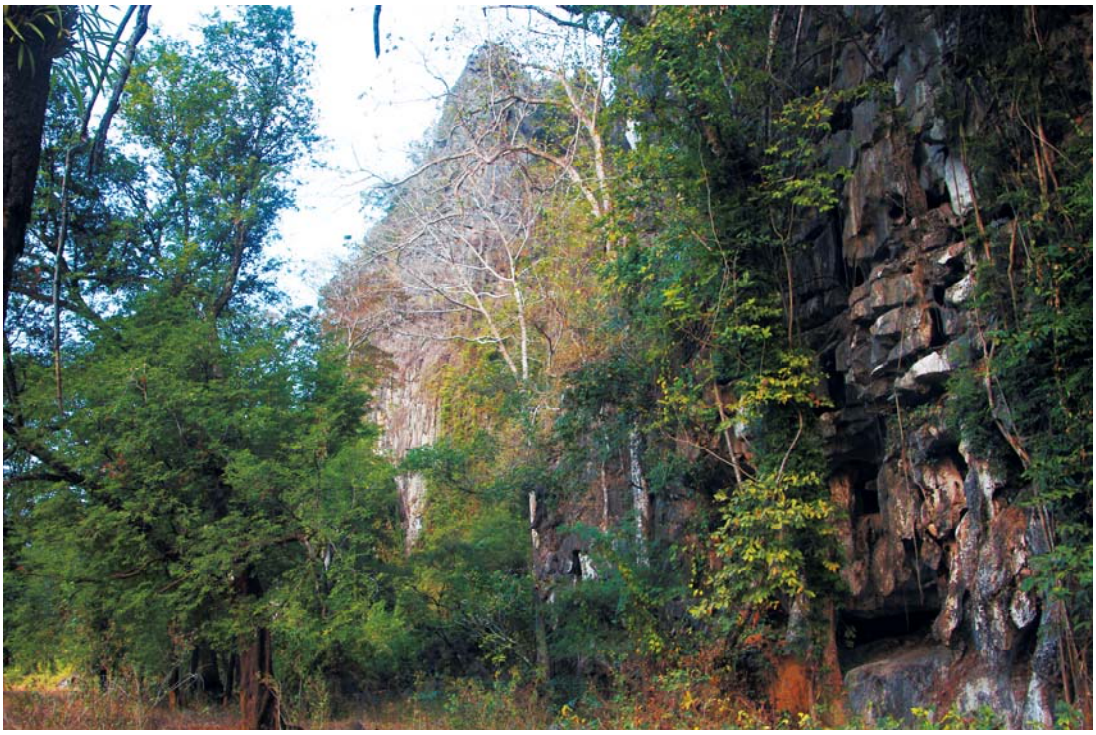


Fig. 1. The rainforest in Khammouane Province, Laos showing karstic formation in the back (Photo by V. Q. Luu)



Fig. 2. Adult male of *Lychas aberlenci* feeding on a conspecific juvenile male (Photo by V. Q. Luu)

Ecological comments

The rainforests inhabited by *L. aberlenci* (Fig. 1) are situated in an area where the Central Indochina Limestone meets the Annamite Chain. As a result, this area has prominent limestone escarpments and many caves (Mouret, 2001). The specific zone where the forests are located is placed in the Northern Annamite ecoregion (Mouret, 2001). The area exhibits a mosaic of semi-evergreen and mixed deciduous forests, whilst pockets of closed Canopy evergreen forest are found within the karstic zones. Further, there are areas of secondary forest, shifting cultivation and bamboo forest. Due to difficult access, much of the forest of the region is free from extensive exploitation, with the exception of areas near roads and villages (Lourenço, 2013).



Fig. 3. Female of *Lychas mucronatus*, occurring syntopically with *L. aberlenci* (Photo by T. Ziegler)

Herein we could confirm that *Lychas mucronatus* is the most abundant scorpion species in the region, which can be found both during the day and at night time, and both on the ground and on tree stems. The new records of *L. aberlenci* close to the type locality confirmed the arboreal life style of this species. Compared with *L. mucronatus*, *L. aberlenci* has to be considered being rare, however, which does not keep individuals from cannibalistic behaviour.

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