



***Xenopeltis unicolor* Boie, 1827 predation upon *Sphenomorphus* sp.**

Xenopeltis is a genus of non-venomous snakes characterized by its iridescent, highly polished scales which give to the species the common name “sunbeam snake”. Currently, two species are recognized (Bergman, 1955; McDiarmid *et al.*, 1999; Rooij, 1917). *Xenopeltis unicolor* Boie, 1827 is found in Southeast Asia and some regions of Indonesia occupying a variety of habitats from primary to secondary forests, agricultural and settled areas from elevations up to 1402 m (Bergman, 1955; Das, 2010; McDiarmid *et al.*, 1999; Rooij, 1917). Being nocturnal and subfossorial, this species inhabits burrows excavated by small mammals and crevices within limestones, spending large amounts of time underground on the leaf litter (Das, 2010; McDiarmid *et al.*, 1999). Pre-maxillary teeth are found in the aglyphous dentition of *X. unicolor* (Dowling, 1959) enabling a varied diet that consists primarily of frogs, lizards (particularly skinks), small mammals (such as rodents), birds and even other snakes (Bergman, 1955; Das, 2010; McDiarmid *et al.*, 1999; Rooij, 1917).

Mertens (1943) described a first predation event in a captive specimen. The author recorded a predation upon a frog being eaten within few seconds. This snake used to be fed every week on a frog, lizard or mouse. In general, the prey was firmly right away being killed by suffocation, or sometimes as much as half an hour later. The frog was then swallowed quickly afterward.

Despite being the most frequently traded species in some areas of Southeast Asia (such as U Minh Thuong National Park, Viet Nam) (Stuart, 2004), its ecology and natural history is still largely unknown (Das, 2004a). Approximately 130 species are currently assigned to the speciose genus *Sphenomorphus* of which 16 can be found in Borneo Island (Das, 2004b; Greer & Shea, 2004; Grismer, 2007). Species of this large group are

known to inhabit deep in forests, avoiding sun flecks. However, individuals can climb several meters up tree trunks to avoid predators or even some can seek safety in riparian microhabitats (Inger, 1959; Malkmus, 1991; Inger *et al.*, 2001). Montane species tend to be more secretive in their habits which leave them poorly understood (Grismer, 2007). Sympatry is common, particularly in some areas of Borneo, where many species present overlapping distribution (Inger *et al.*, 2001).

In this manuscript we describe a predation event by an individual of *Xenopeltis unicolor* upon a *Sphenomorphus* species occurring at the Danum Valley. This report represents a more detailed item in this snake’s species diet in the wild as well as a new confirmed predator for these Bornean skinks.

During research work carried out in Borneo Island, on 28 October 2009, an adult individual of *X. unicolor* (TL \pm 70cm), reddish brown dorsum with white cream ventre, was observed preying on *Sphenomorphus* sp. The predation episode was recorded at the Danum Valley Field Center (at 4°58’ N, 118°48’ E, 200 m a.s.l.) located on the eastern border of the Danum Valley Conservation Area on the east coast of the Malaysian state of Sabah, Borneo Island. Danum Valley Conservation Area is the largest remaining area of undisturbed lowland (<760m) evergreen forest, where dipterocarps consist of up to 80% of the canopy trees (Marsh & Greer, 1992; Newbery *et al.* 1992). The climate at Danum is equatorial with a mean annual temperature of 26.7 °C and mean relative humidity between 78% and 95% (Marsh & Greer, 1992; Walsh, 1990).

When the team approached the spot (at 10h16am, temp. 28°C and humidity 80%), the *Xenopeltis unicolor* individual was hidden under a rotten log on the leaf litter, near a small stream. The skink was then observed a few seconds later getting closer to the crevice where the snake was lying, without noticing its presence. Suddenly, there was an ambush with the snake appearing under the rubble of the trunk and firmly seizing its prey by the head

(at 10:20 hr). The *Sphenomorphus* sp. was immediately immobilized by a double wrap of the snake's body while being secured by the enlarged maxillary teeth deeply embedded into the back of its head. In a closer view of the scene, it became visible that the skink was still alive, moving and struggling in an attempt to escape, for about 30 seconds, while the snake was biting and suffocating it. The *Xenopeltis* maintained its firm grasp for about 1 minute after capture, tightly restricting the

skink with its body. It started swallowing its prey from the head. As reported by Savitzky (1983), the teeth are flexibly mounted on the jaws to permit their hinging or rotation while swallowing (fig. 1.A-C) and so it took about 3 minutes until the tip of the skink tail was completely inside the snake's mouth (at 10h25am). The behavior reported (killing and swallowing) lasted for about 5 minutes. After the predation, the snake returned to the gravel of the rotten log where it remained in its refuge (fig. 1.D).

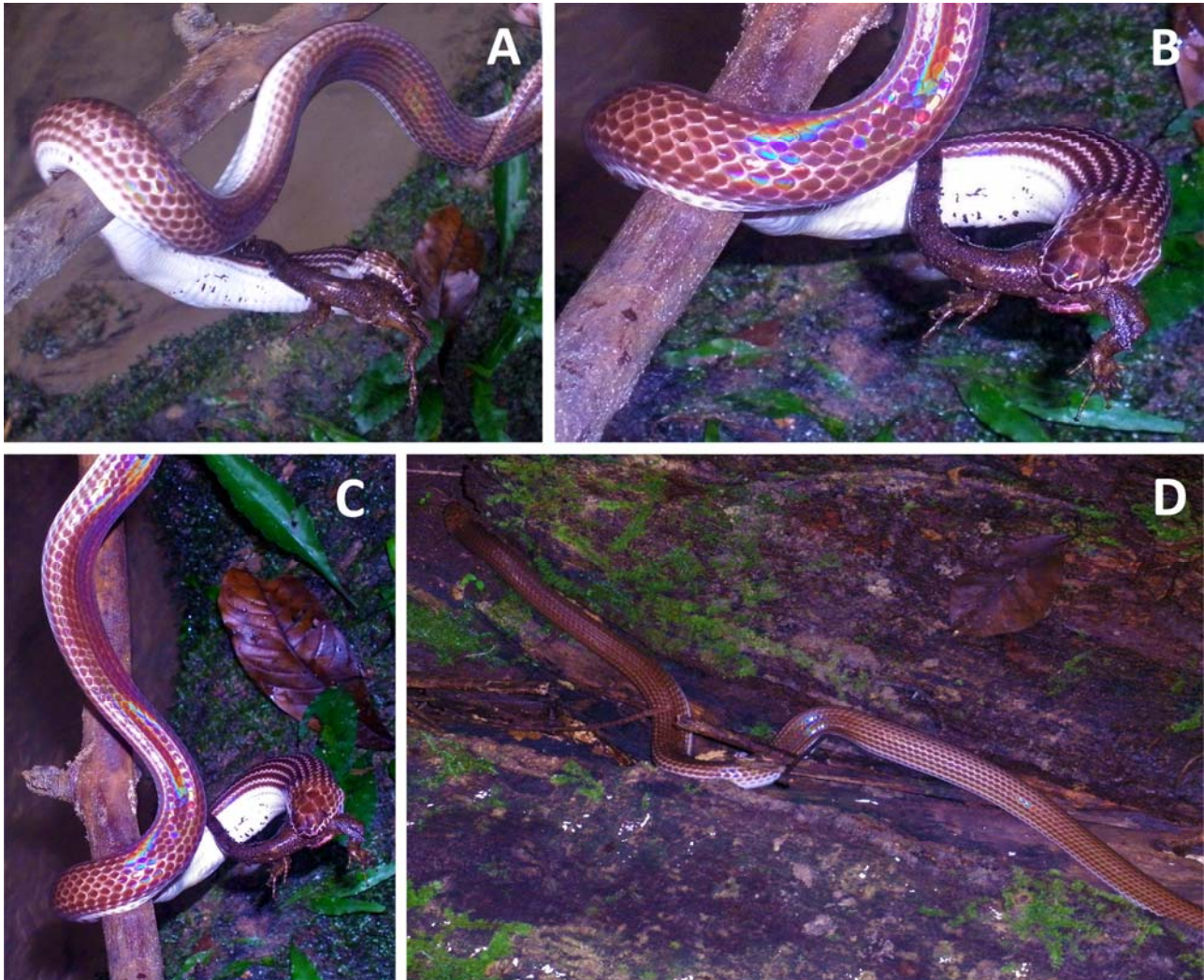


Figure 1: *Xenopeltis unicolor* predating upon a *Sphenomorphus* sp. (A) Snake seizing and immobilising the skink; (B & C) snake swallowing its prey, starting from the head; (D) snake searching for its refuge under the log after eating the skink. (Photos: B. H. Martins)

Taxonomic identification of *Sphenomorphus* group is very difficult (Greer & Shea, 2004) and, during our observation, it was not possible to note the critical diagnostic characters in order to be certain on the species. At the Danum Valley three *Sphenomorphus* species have been recorded: *S. hallieri*, *S. multisquamatus* and *S. sabanus* (Inger *et al.*, 2001). However, we believe that the snake

doesn't restrict its diet to a single species, especially when these skink species are so similar to one another in habits and in general form (e.g., Inger *et al.*, 2001).

Despite the increased research development in the Southeast Asia and the fact that perhaps the Danum Valley Field Centre is the leading forest research

station in tropical Asia (e.g. Fayle *et al.*, 2010; Inger *et al.*, 2001; O'Malley, 2009), there is still the need for continuous studies for greater knowledge and to better understand this important ecosystem. In addition, over the last years, the continuous new discoveries of amphibians and reptiles indicates that the knowledge about the herpetofauna in Borneo is still scarce and therefore much remains to be learned in order to develop consistent conservation strategies (Das, 2004a; Grismer, 2007).

Acknowledgements

This observation was made during a Tropical Biology Association field course supported by the BAT Biodiversity Partnership Borneo Programme. The authors thank to the Royal Society South East Asian Rainforest Research Program and other staff of Danum Valley Field Centre for the support. Robert F. Inger for his valuable comments and insights on the species identification, M. M. Bahir and Christopher Durrant for reviewing the manuscript; finally to Lucília Tibério, Richard Gibson and Ivan Rehak..

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Submitted: 11 April 2012, *Accepted:* 13 April 2012
Sectional Editor: Gernot Vogel

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