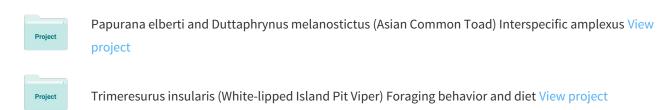
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Trimeresurus insularis (White-lipped Island Pit Viper) Foraging behavior and diet

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Fig. 1. Remains of a *Thrasops jacksonii* that is inferred to have been killed and partially consumed by a *Pan troglodytes* (Chimpanzee) in the Cyamudongo bloc of Nyungwe National Park, Rwanda.

this explanation is highly plausible. First, the vocalizations we heard as we approached are characteristic of a chimpanzee predation event, although they can also be heard from aroused chimpanzees in other situations. Second, the lack of odor and flies suggests that the snake had been killed recently and chimpanzees were in the immediate area. Third, it is doubtful that a carnivore would have so cleanly eaten the flesh from the bones, and a raptorial bird would probably have flown off with the snake and consumed it from an elevated perch.

We recognize that the evidence for this chimpanzee predation event is circumstantial, but chimpanzee predation on a snake would be highly significant. As noted above, we can find no reports of wild or captive apes killing and eating a snake. Because this chimpanzee group lives in a small (6 km²) isolated forest remnant, they may suffer nutritional deficiencies and thus be willing to take a risk to acquire meat. The snake's body was intact, but chimpanzees usually tear apart vertebrate prey and share pieces with other members of the group. This would suggest that only one individual may have learned to kill and eat snakes and could be the starting point for a group-specific behavior or tradition.

Oreste Ndayisaba was our guide on the day of these observations. Eberhard Fischer of Koblenz University identified the snake from a photograph. Gordon Burghardt and James Murphy reviewed the manuscript. We were affiliated with the Great Ape Trust in Des Moines, Iowa when these observations were made.

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TRIMERESURUS FUCATUS (POPEIA FUCATA) (Siamese Peninsula Pit Viper). DIET. Trimeresurus fucatus is a relatively small (to 868 mm total length) arboreal pit viper that occurs in mid-hills to montane forests and is distributed through Myanmar, Thailand, and Peninsular Malaysia (Das 2012. A Naturalist's Guide to the Snakes of Southeast Asia. John Beaufoy Publishing, Oxford, England. 160 pp.). The natural history of *T. fucatus* is not well-studied, and the diet is thought to consist of small mammals and birds (Chan-ard et al. 2015. A Field Guide to the Reptiles of Thailand. Oxford University Press, New York. 314 pp.), although no specific information is available on diet.

On 3 December 2015 at 2130 h on Jalan Air Terjun (Air Terjun Road), Fraser's Hill, Pahang, West Malaysia (3.7203°N, 101.7246°E, WGS84; 1084 m elev.), an adult female $\it T. fucatus$ (SVL ca. 600 mm) was observed on the paved road ingesting another snake



Fig. 1. Trimeresurus fucatus consuming a Rhabdophis chrysargos, with ventral scales of the prey visible.



Fig. 2. Regurgitated Rhabdophis chrysargos carcass.

(Fig. 1). The prey was swallowed head first, with only its tail visible (Fig. 1). Upon removal to vegetation adjacent to the road, the *T. fucatus* proceeded to regurgitate the prey item, allowing positive identification as a *Rhabdophis chrysargos* (Speckle-bellied Keelback; Natricidae, SVL ca. 400 mm; Fig. 2). The dead *R. chrysargos* had sustained tissue damage on the dorsum, presumably from the *T. fucatus* bite. To our knowledge, this note represents the first report of ophiophagy observed in *T. fucatus*.

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TRIMERESURUS INSULARIS (White-lipped Island Pit Viper). FORAGING BEHAVIOR AND DIET. Trimeresurus insularis is a small to medium-sized pit viper native to Indonesia. It is a crepuscular and nocturnal hunter with a reported diet of frogs, lizards, small birds, and mammals (Ruud de Lang 2011. The Snakes of the Lesser Sunda Islands. Andreas S. Brahm, Frankfurt, Germany. 359 pp). Typical foraging behavior observed over four years of field work in the region by SBR and JAM includes perching along stream banks, poised to strike towards the water's edge in areas populated with aquatic anurans; perching in vegetation immediately adjacent to limestone rock walls and tree buttresses with their heads oriented towards the wall faces in areas with climbing lizards; perching near to the ground suspended from vegetation; and actively hunting 5–15 m off of the ground in the canopy. In this note we report a novel prey item.

On 20 July 2013, at 2255 h, an adult *T. insularis* (SVL = 43.5 cm, tail length = 12.5 cm, 46.18 g) was captured in the forest surrounding Ilwaki, Wetar Selaten, Maluku Barat Daya, Provinsi Maluku, Indonesia (07.92481°S, 126.40734°E; WGS84). The individual was found ca. 30 cm above the ground, coiled in vegetation. During preparation of the specimen, we noticed a substantial bolus that proved to be a decomposing and rancid-smelling *Cylindrophis boulengeri* (Boulenger's Pipe Snake). This represents the first documented account of a *T. insularis* feeding on a snake. This observation is also of particular note because *C. boulengeri* is a fossorial snake that occurs only on the islands of Wetar, Babar, and Timor. The species is relatively uncommon, with only 10 specimens known prior to our expedition (four additional specimens were collected by our team).

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XENOCHROPHIS FLAVIPUNCTATUS (Yellow-spotted Keelback Watersnake). DIET. Xenochrophis flavipunctatus is a semiaquatic snake that is distributed in Southern China, Taiwan and the Indochinese Peninsula (Vogel and David 2012. Zootaxa 3473:1–60). A nocturnal species, X. flavipunctatus is known to prey on fish and frogs (Das 2013. A Naturalist's Guide to the Snakes of Southeast Asia. John Beaufoy Publishing, Oxford, UK. 127 pp.). Here, we report observations of X. flavipunctatus predation on aquatic eggs of Microhyla heymonsi and arboreal eggs of Chiromantis hansenae. To our knowledge, this is the first report of a Xenochrophis species or any other old-world Natricine snake consuming frog eggs. Furthermore, this is also the first report of Microhyla and Chiromantis eggs being preyed upon by a snake.

Field observations were conducted in seasonal ponds at the Sakaerat Environmental Research Station in northeastern Thailand (14.5°N, 101.916°E; WGS84) in 2012 and 2014. On 12 July

2012, a *X. flavipunctatus* was observed consuming a *M. heymonsi* egg mass starting at 0550 h and lasting approximately 5 min. Less than a quarter of the egg mass was consumed before the individual moved away, possibly due to presence of the observer. *Microhyla heymonsi* is an aquatic-breeding chorus frog found in East and Southeast Asia (Baker and Lim 2008. Wild Animals of Singapore. Draco & Nature Society, Singapore. 66 pp.). Eggs of *M. heymonsi* are laid in a clutch that is spread out as a single layer of film on the pond surface and are often anchored by emergent vegetation.

On 16 September 2012, two separate events of X. flavipunctatus predation of C. hansenae egg masses were recorded at 0033 and 0435 h using time-lapse cameras (Brinno GardenWatchCam, photographs taken at 10-sec intervals). On 7 October 2014, a third predation event of C. hansenae eggs was observed directly at 2315 h. Chiromantis hansenae is an arboreal-breeding treefrog found in Thailand and parts of Cambodia (Taylor 1962, Univ. Kansas Sci. Bull. 43:267-599; Aowphol et al. 2013. Zootaxa 3702:101-123). Eggs of C. hansenae are deposited in a hemispherical gelatinous mass attached to vegetation or other substrates overhanging water and female frogs provide parental care in the form of egg attendance (Poo and Bickford 2013. Ethology 119:671-679). In all three observations, C. hansenae egg masses were attached to grass blades and were positioned 15-30 cm above pond surface. Female C. hansenae adults were either away from egg masses (one case in 2012) or left immediately (two other cases) when X. flavipunctatus individuals approached. Xenochrophis flavipunctatus approached C. hansenae egg masses by balancing on emergent grass blades or extending their body from the water, and egg masses were consumed as a whole. After predation events occurred, X. flavipunctatus remained around the vicinity for approximately 10 min before moving away.

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