



FIG. 1. *Holcosus festivos* eating different prey in Veragua Rainforest, Costa Rica: A) juvenile eating an adult orthopteran (Tettigoniidae: Copiphorini); B) adult male feeding on a small individual of the snake *Oxybelis koehleri*.

understory environments. Here we present two instances of *H. festivos* concerning its diet and feeding behaviors at Veragua Rainforest Preserve, Las Brisas de Veragua, Limón, Costa Rica (9.9264°N, 83.1876°W; WGS 84; 420 m elev.).

Our first observation occurred on 25 January 2021, at ca. 1032 h, when we observed a juvenile of *H. festivos* with a large, adult female katydid (Tettigoniidae, tribe Copiphorini) in its mouth (Fig. 1A). The lizard held the already dead katydid by the side of its head, and we estimated the insect to be at least twice as long as the lizard's head. Over the course of ca. 33 minutes the lizard repeatedly bit the katydid, quickly alternating its bites from the head region, and the base of the hind limbs and wings. During this time it also frequently beat the katydid against rocks and small branches until the head, legs, and wings fell off, and shortly after the appendages were removed it swallowed the katydid headfirst, which took ca. 1 min. (video available at <http://dx.doi.org/10.26153/tsw/48790>).

Our second observation occurred on 12 December 2022, at ca. 0930 h, when we observed an adult male *H. festivos* feeding on a small *Oxybelis koehleri* (Kohler's Vine Snake; Fig. 1B). Initially, we heard rapid movements underneath the leaf litter, and seconds later the lizard emerged holding the snake in its mouth from the anterior part of the body, close to the snake's head. While we did not witness how the chase or capture unfolded, we surmised by noise that the two individuals grappled beneath the leaf litter for

ca. 2 min. By the time we saw the event, the snake's most posterior part of the body was wrapped around the lizard's anterior part of the body and front limbs while it was being swallowed alive headfirst. It took the lizard more than two minutes to completely swallow the snake, and during this process we counted ca. 60 biting-swallowing motions until it was completely ingested, all while the snake's tail moved until entirely eaten (video available at <http://dx.doi.org/10.26153/tsw/48790>), which took ca. five minutes.

To our knowledge our observations contribute two novel aspects to the foraging and diet biology of *H. festivos*, processing time and behavior when consuming large prey and a novel snake prey item in its diet. While katydids, i.e., orthopterans, are known in the diet of *H. festivos*, stomach analyses report that small prey, ca. 15 mm in length, are most commonly consumed (Vitt and Zani 1996, *op. cit.*; Abarca and Knapp 2010, *op. cit.*). Although larger prey, up to 50 mm in length have been reported, it appears to be rare (Vitt and Zani 1996, *op. cit.*). Our observation suggests the time required to manipulate and consume large prey, 33 min in this case, may be the reason large prey items are rarely consumed by *H. festivos*, because they are vulnerable to predation or other threats during this time. The consumption of the juvenile snake *O. koehleri* was likely opportunistic, it emphasizes the acute foraging abilities of *H. festivos* (Chaves-Acuña and Salas-Solano 2021. *Herp. Rev.* 52:858-859). To our knowledge this is the first report of a snake in the diet of any *Holcosus* species, and the first report of a lizard preying on *O. koehleri*.

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#### **LANTHANOTUS BORNEENSIS (Bornean Earless Monitor).**

**DIET and ATTEMPTED PREDATION.** *Lanthanotus borneensis* is a semi-aquatic lizard endemic to Borneo, and except for an earthworm and crustacean found in the gut of one specimen (Losos and Greene 1988. *Biol. J. Linn. Soc.* 35:379-407) little is known of its diet in the wild. Captive lizards have been reported to eat fish (Harrisson 1961. *Sarawak Mus. J.* 10:286-292; Mertens 1966. *Sarawak Mus. J.* 14:320-322), squid, earthworms (Mendyk et al. 2015. *Biawak* 9:44-49), and frogs (Arroyan et al. 2021. *Treubia* 48:103-116). Langer (2017. *Russian J. Herpetol.* 4:1-10) reported crab remains in the proximity of a female *L. borneensis* retreat but suspected these were left by the crab-eating *Varanus dumerilii*. Here, we report on a new prey item and an instance of attempted predation on crabs observed in *L. borneensis*.

We used radio transmitters, attached to individuals using the harness method (Knapp and Owens 2015. *Herpetol. Rev.* 36:264-266), to track *L. borneensis* in the Kapit region of Upper Baleh, northern Kapit (1.95°N, 112.92°E; WGS 84; 190 m elev.), Sarawak, East Malaysia (Borneo), as part of a larger study on the spatial and thermal biology of the species. On 15 September

2020, at 2240 h, one of our adult female *L. borneensis* (140 mm SVL, 34 g) was observed with a crab, *Borneosa kapit*, in its mouth (Fig. 1) along a rocky stream after a rain shower. It appeared the lizard had just acquired the crab and held it for about five minutes, during which time both the crab and the lizard were motionless. We then captured the lizard and placed it in a bag



FIG. 1. *Borneosa kapit* caught by female *Lanthanotus borneensis* (145 mm SVL, 30 g). Inset: Crab, *B. kapit*, captured by female *Lanthanotus borneensis* on 15 September 2020. Scale bar = 10 mm.

where it dropped the crab, but suspect the lizard would have consumed the crab if not captured.

A second record related to the trophic biology of the lizard was made on 24 May 2022 when we acquired a fecal sample from this same radio tracked individual found in loose soil ca. 10 cm from the edge of the of the stream that contained the remains of an unidentifiable species of cockroach (family Blaberidae; Fig. 2). To our knowledge this is the first report of a cockroach in the diet, and what appears to be attempted predation on a freshwater crab by this little-studied species.

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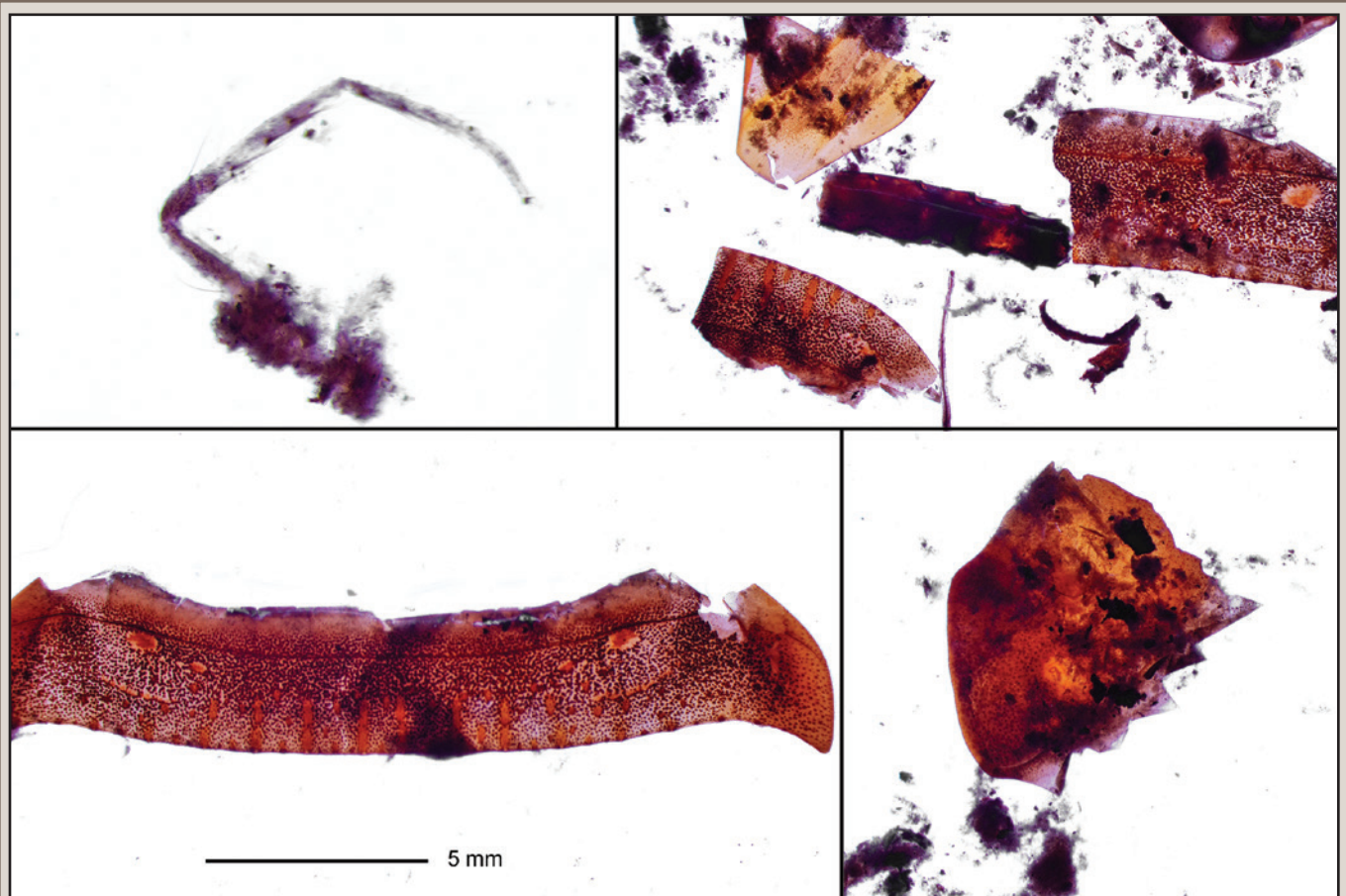


FIG. 2. Cockroach (family Blaberidae) remains from fecal matter obtained from the female *Lanthanotus borneensis* on 24 May 2022. Scale bar = 5 mm.