

Predation attempt by a White-throated Monitor *Varanus albigularis albigularis* (Daudin, 1802) on a free-tailed bat (Chiroptera: Molossidae) in South Africa, with a review of chiropterans in the diets of varanids (Squamata: Varanidae)

Przemysław Zdunek¹

The White-throated Monitor, *Varanus albigularis albigularis* (Daudin, 1802), is a large, diurnal (with a few reports of nocturnal activity), mainly terrestrial lizard of the family Varanidae (Bennett, 1998; Spawls et al., 2018). The distribution of *V. a. albigularis* extends throughout much of southern Africa, including Zambia, Mozambique, and north to Angola (Bennett, 1998; Auliya and Koch, 2020; Eidenmüller, 2021). It is a carnivorous varanid that feeds on a wide variety of animal prey, including small mammals, birds, snakes, other lizards, eggs, frogs, toads, tortoises, snails, invertebrates, and even carrion (Bennett, 1998; Pianka et al., 2004; Cunningham and Cunningham, 2010; Conradie, 2012; Dalhuijsen et al., 2014; Branch et al., 2015; Spawls et al., 2018). *Varanus a. albigularis* averages approximately 150 cm in total length, with a record length of 213 cm, and as such its size allows it to swallow large prey, e.g., different tortoise species (Bennett, 1998; Conradie, 2012; Dalhuijsen et al., 2014; Auliya and Koch, 2020).

Free-tailed bats (Molossidae) are the fourth-largest family of bats, containing about 110 species in 16 genera (Ammerman et al., 2012). Many species in this family are similar in appearance and can only be (externally) distinguished by subtle anatomical features (the extent of ear joining, shape of the antitragus, wrinkles on the lips, and the presence of rump bristles; Freeman, 1981).

On 17 November 2021 at 16:18 h, a juvenile *V. a. albigularis*, approximately 35–40 cm in total length,

was observed interacting with a bat, in Maroela Camp (west-central Kruger National Park), near the bank of the seasonal Timbavati River (which was dry at the time), Mpumalanga Province, South Africa (–24.4561°S, 31.3990°E; elevation 428 m). The monitor lizard was identified by its whitish throat, prominent blackish temporal streak extending from behind the eye to the shoulder, and contrasting dark bands on the tail (Auliya and Koch, 2020). The bat was identified by Natalie Weber as a member of the Molossidae. Unfortunately, photos and videos did not permit positive identification of the genus and species (experts were hesitant to identify it as an Egyptian Free-tailed Bat [*Tadarida aegyptiaca*]). At the time of the observation it was sunny, with an ambient temperature of 27–30 °C. The observation began with hearing an unusual distress call from the bat. Approximately five minutes after hearing the vocalisation, the confrontation between the monitor lizard and bat was observed and recorded (several photos and two videos). The interaction occurred on hard, bare ground, and the bat appeared slightly injured, especially around the mouth and shoulder. This did not prevent the bat from resisting the attacking monitor lizard, and the struggle continued for several minutes (Fig. 1A, B). At one point in the struggle, the monitor lizard flipped the bat onto its back and appeared to be trying to eat its softer underside (Fig. 1C, D). While holding its prey, the monitor lizard tried to pull the bat up a tree (Fig. 1E, F), where the bat freed itself and the struggle again continued on the ground. The bat tried to escape again, however the monitor lizard was able to pick it up and carry it to a cavity at the base of a tree about 15 m away (Fig. 2). The monitor lizard appeared to hide the bat in the tree hollow and no additional vocalisations were heard for the remainder of the observation, suggesting the death of the bat. The entire event lasted approximately 10 minutes from the onset of vocalisation to the monitor lizard hiding its prey. I do

¹ Association du Refuge des Tortues, 2920 Route de Paulhac, 31660 Bessières, France; and NATRIX Herpetological Association, Ulica Opolska 41/1, 52-010 Wrocław, Poland. E-mail: zdunek.komodo@gmail.com



Figure 1. Photographic sequence of a juvenile *V. a. albigularis* predating on a molossid bat. (A) The animals bite each other; (B) the monitor lizard bites onto the bat's mandible; (C, D) Fighting continues, with the monitor lizard flipping the bat onto its back and attacking its soft belly; (E, F) the monitor lizard dragged the bat up a tree. Photos by Jenny Andersen.

not know whether this represents a successful predation, as the observation ended once the animals entered the tree cavity and were thus lost from sight.

To the best of my knowledge, I present here the first direct observation of a predation attempt by *V. a. albigularis* on a molossid bat in South Africa (Dalhuijsen et al., 2014). Few varanid species are known to feed on bats (Table 1). Tanalgo et al. (2020) reported solitary opportunistic predation of adult Cuming's Water

Monitor, *V. cumingi* Martin, 1839 on Geoffroy's roussette, *Rousettus amplexicaudatus* (Chiroptera: Pteropodidae) with a standby/surveillance phase and a hunting phase in the lower region of a cave in the Philippines. In contrast, Clarkson and Massyn (2020) reported several adult Two-striped Water Monitors, *V. salvator bivittatus* (Kuhl, 1820), feeding on bats in a cave in Indonesia with no signs of intraspecific aggression or competition over prey items. Tanalgo et al. (2020) documented smaller

Table 1. Summary of published records of bats in the diets of monitor lizards (*Varanus* spp.).

| Monitor lizard species | Bat species | Monitor lizard age class | Type of observation | Location | Reference |
|-----------------------------------|--|--------------------------|---------------------|--------------|---------------------------|
| <i>Varanus</i> spp. | <i>Pteropus</i> spp. | - | Stomach contents | Australia | Nelson, 1965 |
| <i>V. komodoensis</i> | Unidentified bat species | - | Faecal contents | Indonesia | Losos and Greene, 1988 |
| <i>V. bengalensis</i> | <i>Kerivoula picta</i> | - | Direct observation | Sri Lanka | Karunaratna et al., 2017 |
| <i>V. salvator bivittatus</i> | Unidentified cave-dwelling bat species | Adult | Direct observation | Indonesia | Clarkson and Massyn, 2020 |
| <i>V. cumingi</i> | <i>Rousettus amplexicaudatus</i> | Adult | Direct observation | Philippines | Tanalgo et al., 2020 |
| <i>V. albigularis albigularis</i> | Free-tailed Bat (Molossidae) | Juvenile | Direct observation | South Africa | <i>This record</i> |

varanids attempting to capture bats, but these attempts frequently failed. *Varanus a. albigularis* are known to hide in thickets, holes (aardvark and porcupine burrows), rock fissures, tree holes, and abandoned termite hills (Spawls et al., 2018). They may also use trees as refugia from midday heat or as overnight retreats (Pianka et al., 2004). The described observation also indicates the use of refugia as a way to consume prey undisturbed in a safe place. Observations such as these, even as single events, broaden the scope of information about the natural history and ecology of monitor lizards and their chiropteran diet.



Figure 2. Juvenile *V. a. albigularis* dragging its prey to a refuge at the base of another tree. Photo by Jenny Andersen.

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