

Courtship and mating behaviour of the Kenyan Rock Agama, *Agama lionotus elgonis* Lönnberg, 1922, and a new locality record in Lake Manyara National Park, Tanzania

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The Kenyan Rock Agama, *Agama lionotus* Boulenger, 1896, is a large to medium-sized, rock-dwelling lizard widely distributed in Kenya and Tanzania (northeast to southwest) and exhibits both sexual dichromatism and size dimorphism (Manthey and Schuster, 1996; Spawls et al., 2018). Adult males display bright red-orange or orange-yellow heads with blue bodies, and their throats are orange. In contrast, the subspecies *Agama lionotus elgonis* Lönnberg, 1922, has an orange throat with black markings at the base (Wagner, 2007). Females are light brown and may have maroon to white dorsolateral patches (Spawls et al., 2018). This species is diurnally active and has a maximum recorded snout-vent length of 35 cm (Spawls et al., 2018). The reproductive period is during the rainy season, and females lay 5–10 eggs in a hole, with hatchling sizes of 8–10 cm. In Ethiopia, the incubation time for eggs of this species was reported to be 50–60 days (Spawls et al., 2018).

There are a few documented observations of courtship behaviour within the reproductive period of *A. lionotus* in its natural habitat. Herein, we describe the courtship and mating behaviour of *A. l. elgonis* in Lake Manyara National Park, Tanzania (−3.6262°S, 35.7395°E, 968 m elevation). Additionally, we document a new locality record for this subspecies in this part of Tanzania.

On 22 January 2023 at 11:32 h, a male in displaying colouration was observed in the middle of a rock, moving his head rhythmically by straightening and bending the front limbs (bobbing) (Fig. 1A). After four minutes, the male disappears to the other side of the rock to return

a moment later, holding the adult female by the neck, and dragging her onto its centre, held down, the female makes rhythmic movements with her head several times (Fig. 1B). After a minute had passed, the male turned his back and introduced the hemipenis, while releasing the female's neck (Fig. 1C). The female took several steps in the opposite direction, while the male stretched one of the hindlimbs and performed multiple up and down movements interpreted as mating movements (Fig. 1D). Then the female freed herself from the mating grip, leaving the immobile male nearby (Fig. 1E). After five minutes had passed, the male joined the female and both individuals made alternately rhythmic head movements (Fig. 1F), after which the female disappeared behind the stone leaving the male alone in the middle of the rock. The male remained in this position for several minutes. The area around the rock complex was covered with grassland and acacias, close to a thick rainforest (Fig. 2). At the time of observation, the temperature was between 26–28°C, with cloudy skies and no wind. The observation lasted approximately 15 minutes. To avoid disturbing the animals, photos and videos were taken from a suitable distance with a 400–800 mm Sony lens.

Twenty-five types of courtship and mating behaviours are known for agamids (Pandav et al., 2007). During this observation we documented eleven of these: stand high, limp, neck bite hold, stationary, copulation, grip release, follow, half head bob, head bob, push-up, and head up/lift. At the same time, the intensity of the male's body colour may also indicate his dominance and sexual selection (Madsen and Loman, 1987).

To the best of our knowledge, this is the first documented observation of the courtship behaviour of *A. l. elgonis*. Observations such as these, even as single events, can broaden the scope of information about the natural history and ecology of agamid lizards and their reproductive behaviour. This observation also represents a new distribution record for this subspecies in Tanzania, where this lizard has been documented

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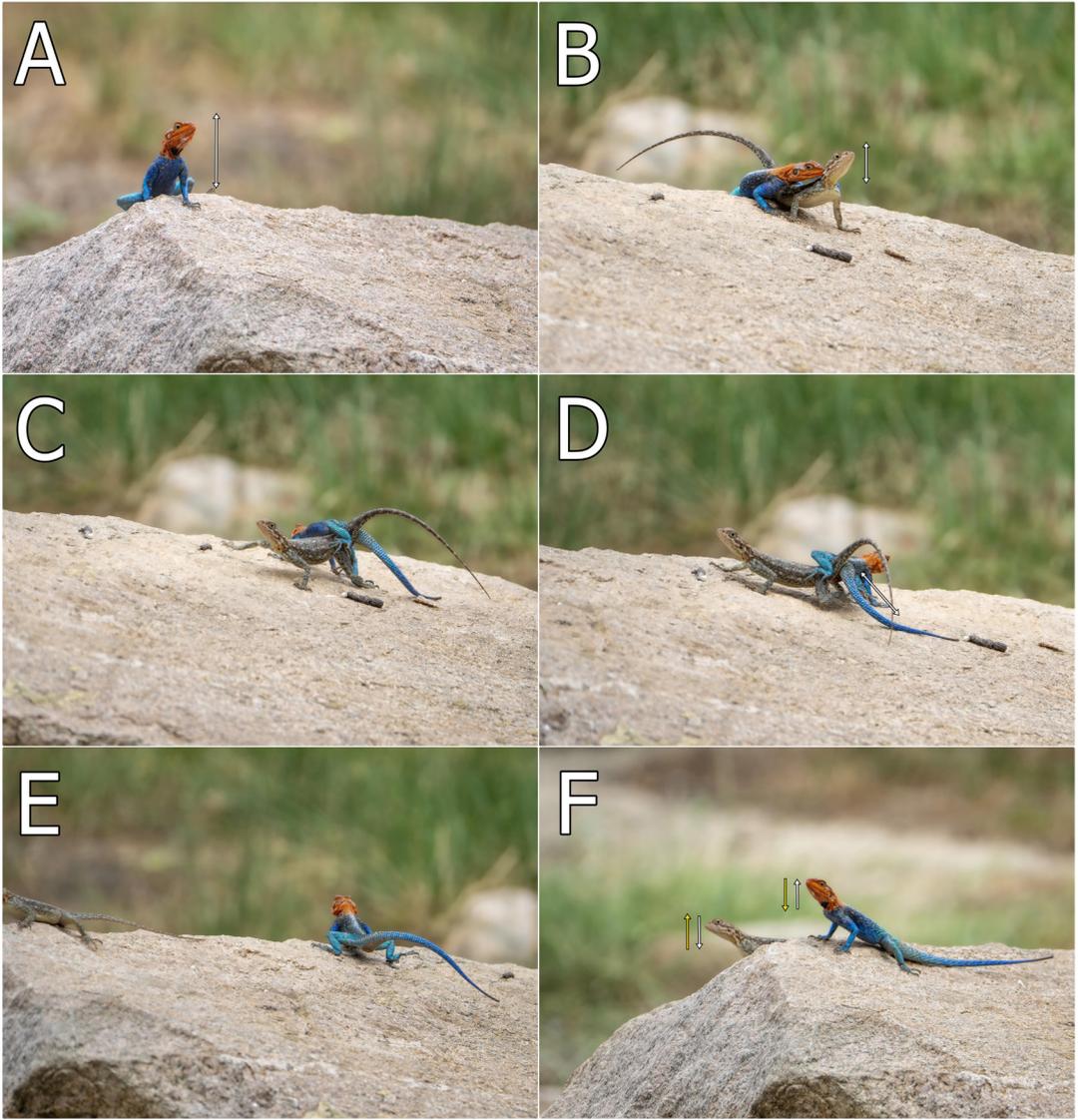


Figure 1. A sequence of images documenting courtship and mating behaviour in *Agama lionotus elgonis*. Movements are suggested by arrows. A displaying male (A) holds the adult female by its neck (B) as the female makes rhythmic movements with her head several times. Then the male turned his back, introduced the hemipenis (C), stretch one of the hindlimb, and made several movements (D). When the female freed herself from the male's grip, the male remains still (E) until the female approach him again and both lizards made alternating neck movements (F). Photos by Przemysław Zdunek.

before only in Arusha (Wagner, 2014; Spawls et al., 2018; Uetz et al., 2025). This subspecies is also known from Kenya and Uganda (Mount Elgon, Nakuru NP, Laikipia) (Loveridge, 1957; Wagner, 2014; Spawls et al., 2018; Uetz et al., 2025).

Acknowledgments. We would like to thank Grégory Deso for the pre-review of our manuscript and Angelica Crottini for her comments, which helped us improve our work. Thanks to Matthijs van den Burg for excellent copy-editing. Special thanks to Aurélie, companion of this fieldwork, without whom these observations would not have been possible.

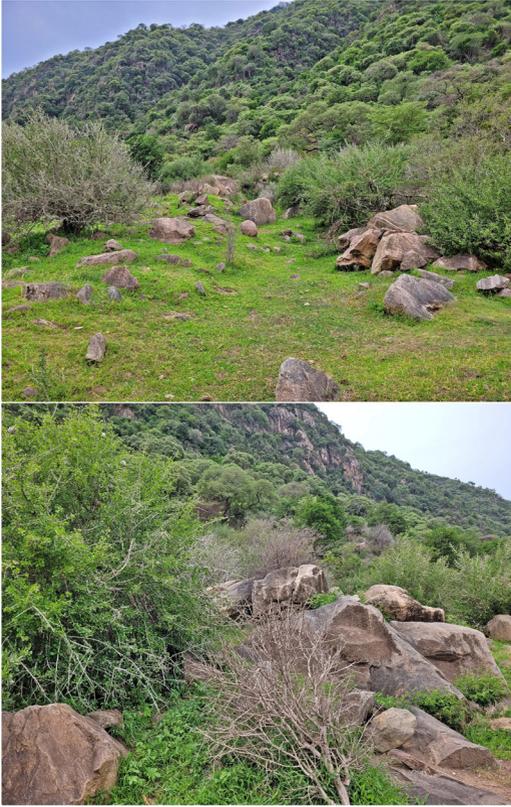


Figure 2. Observation area with the characteristic rocks used by the lizard as shelter. The area is surrounded by acacias and a thick rainforest. Photos by Przemysław Zdunek.

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