Survival and reproduction are the main aspects of any life form. When it comes to survival, animals are continuously exposed to different threats and dangers from nature. Most animals face the challenge of dealing with multiple predators and their level of survival depends on their ability to detect predators, various predator avoidance mechanisms and anti-predatory behaviours. Most prey species adjust their behaviour or appearance in response to their predators (Hopper 2001; Templeton and Shriner, 2004; Stuart-Fox et al., 2006; Langridge et al., 2007; Rundus et al., 2007). Body colouration is the main characteristic that determines the appearance of an animal, which comes in the forms of camouflage, conspicuous/disruptive colouration and mimicry against predators (Stevens, 2007). Physiological colour change is used by prey species for rapid colour changes (Stuart-Fox and Moussalli, 2008). Colour change not only enables animals to match different backgrounds but also enables prey to change their appearance in the face of different predators (Langridge et al., 2007) and potentially adjust their camouflage depending on the visual capabilities of the predators. Many animals use colour change for camouflage as well as communication. Colour patterns in animals exploit different predator avoidance or anti-predator mechanisms including disruptive camouflage or motion dazzle (stripes), intimidation of predators or deflecting attention towards the tail and background matching (Stevens, 2007; Stevens et al., 2008). The visual perception mechanisms of the animal, as well as the predator and prey species to which it must appear camouflaged need to be considered to better understand these strategies (Endler, 1978; Kelman et al., 2008).

*Calotes calotes* (Linnaeus, 1758) (Common Green Forest Lizard) is an agamid lizard found in the forests of the Western Ghats and the Shevaroy Hills in India, and Sri Lanka. It is a considerably large species of agamid, measuring up to 41 cm in length, including the tail. The body colouration of *C. calotes* is generally green. There is no record on contrastingly different colour changes in

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Figure 1. *Calotes calotes* in general green body colouration at Wasgamuwa National Park, Sri Lanka.

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**Colour change as an anti-predatory mechanism in *Calotes calotes* (Linnaeus, 1758) (Squamata: Agamidae) sighted at the Wasgamuwa National Park, Sri Lanka**
this species apart from adult males changing their head and gular sac colouration from yellowish green into a red or dark red hue during breeding (Somaweera and Somaweera, 2009). The underside is a pale green, the tail is light brown.

*Dendrelaphis tristis* (Daudin, 1803), Common Bronzeback Tree Snake, is a long, slender, graceful tree snake that is non-venomous. This species is distributed in the wet, intermediate and dry zone lowlands of Sri Lanka and can be found in India, Pakistan and Nepal as well (Das and de Silva, 2005). This diurnal and arboreal snake is known to forage on land and along the edge of water. According to Das and de Silva (2005) they can make long jumps between trees, up to distance of 25m. Diet comprises frogs, lizards, bird eggs and insects. (Das and de Silva, 2005).

Here we present some field notes on the observation of prey-predator interaction among *D. tristis* and *C. calotes* at the Wasgamuwa National park. Wasgamuwa National Park is home to several agamid species including the common *C. calotes* as well as *C. ceylonensis* and *Otocryptis wiegmanni* (Senarathna, 2005).

**Attack incident.**—On 30th July 2015 around 16:00 when we were inside the National park, we observed a *C. calotes* being attacked by a *D. tristis* (Figure 2a). This lizard was on the ground among the “Mana” grass (a tall grass species) bushes. The initial colour of this *C. calotes* was green with 5 or 6 white/cream colour transverse stripes.

The initial attack took place at 16:08. We observed the *D. tristis* jumping towards the lizard through the “Mana” grasses. The Snake was rapid and the lizard was

![Figure 2](image-url)
gripped from its head. The lizard, a well grown male, attempted several times to escape. In its defense to the snake, we observed the colouration of lizard changing from a greenish dorsal colouration to a dark black dorsal colouration and the appearance of broad, white transverse stripes (Figure 2b). The colour of the head of the lizard changed from green to bright red/orange. There were 17 white stripes clearly visible from head to the tail end. In addition, bands of white spots were present on the forelimbs and the hind limbs. The colour change was complete by 16:10 and it took less than 120 seconds to change the general body colouration into the contrasting defense colouration against the predator.

Despite the change of colour and continuous escaping efforts, the lizard appeared to be defeated and immobilized (probably as a result of the strong head restraint of lizard by the snake) at 16:21, eighteen minutes after the initial attack. The snake began to work the lizard around and was swallowing the lizard head first. At 16:29, the dark black colour of the *C. calotes* started to change back to the previous green colour. It took nine minutes to change the colour back into the general green body colouration (Figure 2c – Figure 2d). By this time the lizard was probably dead. Therefore, it can be concluded that the lizard actively changed its colour as a response to the predator attack. These lizards can be very aggressive towards snakes since they are relatively large agamids themselves. However, in this case the non-venomous *D. tristis* easily overpowered the *C. calotes*.

Hopefully, this field record from Wasgamuwa National Park may help to understand a less known and a relatively complex anti-predatory behaviour in *Calotes* lizards. Our observations suggest a deviation from the general camouflage strategies of lizards in which they blend with their background to avoid the predator. In fact, the lizard changed its color as a response to the attack by the snake. Therefore, it seems that *C. calotes* lizards tend to distract their predator when the attack is unavoidable. Despite such behaviours being uncommon among agamids, chameleons are known to exploit this strategy more often (Cott, 1940; Dodd Jr, 1981; Stuart-Fox et al., 2006). Several explanations can be given for this unusual rapid colour change: 1. The lizard tried to distract the non-venomous *D. tristis* by mimicking the colouration of highly venomous *Bungarus caeruleus* (Schneider, 1801) (Common Krait) which has a very similar pattern of white bands on dark body; 2. Reflecting the attention away from the head by interfering with the visual perception of the predator. The rapid colour change has the potential to startle the predator and deviate its focus. When it comes to visual perception of snakes, Gracheva et al. (2010) describe the ability of snakes to detect infrared (IR) radiation which enables the generation of a ‘thermal image’ of prey. However, IR detection is more accurately and frequently used by nocturnal snakes and pit-bearing snakes (Roelke and Childress, 2007; Gracheva et al., 2010). Therefore, *C. calotes* may be using this anti-predatory colour change against other predators as well. Against a different predator it might have more impact and a higher chance of survival.

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