

NOTES ON THE TERRITORIAL BEHAVIOUR OF *OTOCRYPTIS WIEGMANNI* WAGLER, 1830 (REPTILIA: AGAMIDAE: DRACONINAE)

D.M.S. SURANJAN KARUNARATHNA^{1,3} and A.A. THASUN AMARASINGHE^{2,3}

¹ IUCN, Sri Lanka Country Office, 53, Horton Place, Colombo 7, Sri Lanka.

² Taprobanica Nature Conservation Society, 146, Kendalanda, Homagama, Sri Lanka.

Abstract: The first documentation on the territorial behaviour of *Otocryptis wiegmanni* Wagler, 1830 is reported here mainly from Dombagas-kanda Proposed Forest Reserve, Sri Lanka. In addition, more than twenty five observations on territorial behaviour of *O. wiegmanni* observed during the past five years were included into this analysis. In this study, we investigated the territorial behaviour by focusing on five steps of the whole behaviour pattern that consist of attacking, appalling, struggling, savaging and chasing.

Key Words: Agamidae, *Otocryptis*, aggression, adult male, territorial behaviour, Sri Lanka.

Resumen: D.M.S. Karunarathna y A.A. Thasun Amarasinghe. "Notas sobre el comportamiento territorial de *Otocryptis wiegmanni* Wagler, 1830 (Reptilia: Agamidae: Draconinae)". La primera documentación sobre el comportamiento territorial de *O. wiegmanni* Wagler, 1830 es reportada aquí principalmente de la Propuesta Reserva Forestal de Dombagas-kanda, Sri Lanka. Adicionalmente, más de veinticinco observaciones sobre comportamiento territorial de *O. wiegmanni* observados durante los últimos cinco años fueron incluidos en este análisis. En este estudio, nosotros investigamos el comportamiento territorial enfocándonos en cinco pasos del patrón completo de comportamiento que consiste en ataque, amedrentamiento, lucha, embestida y persecución.

Palabras Clave: Agamidae, *Otocryptis*, agresión, macho adulto, comportamiento territorial, Sri Lanka.

INTRODUCTION

There are 18 species of agamid lizards in Sri Lanka and 15 (83%) of them are endemic to the country. In Sri Lanka the genus *Otocryptis* is represented by two species, *O. wiegmanni* Wagler, 1830 and *O. nigristigma* Bahir and Silva, 2005. *Otocryptis wiegmanni* is distinguished from *O. nigristigma* by having a maroon patch on the male dewlap (gular sac) (Fig. 1) and a longer fifth toe (vs. a distinctly black patch present laterally on dewlaps on males, and shorter fifth toe). The endemic *O. wiegmanni* is widely distributed throughout the wet zone (annual rainfall >2000 mm) of Sri Lanka up to 1340 m elevation (Bahir and Surasinghe 2005; Deraniyagala 1953; Manamendra-Arachchi and Liyanage 1994).

MATERIAL AND METHODS

We observed territorial behaviour of *Otocryptis wiegmanni* (Fig. 2) at Dombagas-kanda Proposed Forest Reserve in Kalutara District in the Western Province of Sri Lanka. In

addition, more than twenty five observations on territorial behaviour of *O. wiegmanni* observed during the past five years were included into this analysis. The observations mainly described here were made by the naked eye, about two meters away from the lizards, from 11:40 h to 11:58 h. No disturbance was made to the animals during the time of observation. All measurements were taken to the nearest 0.1 mm using a dial calliper and to the nearest millimetre with measuring tapes after observations. After taking all the measurements, lizards were released to the original habitat.

The study area is located between 06°44'N and 80°09'E, approximately 15 km away from Horana town (altitude 60 m a.s.l.). The Dombagas-kanda Proposed Forest Reserve is under care of the Department of Forest in Kalutara District in Western Province of Sri Lanka. The major vegetation type in this area is lowland tropical evergreen forest (Gunathilake and Gunathilake 1990). The mean annual rainfall is 3463.4 mm (mainly during South Western monsoon), while the mean annual temperature is 27.8 °C (Ranasinghe and Ratnayake

³ Send correspondence to / *Enviar correspondencia a:*
dmsameera@gmail.com
aathasun@gmail.com

Received / *Recibido* 20 AUG 2008
Accepted / *Aceptado* 10 NOV 2008



FIG. 1. A mature male of *Otocryptis wiegmanni* while expanding its dewlap (Photo courtesy of Dulan Ranga).
Macho adulto de Otocryptis wiegmanni expandiendo su saco gular (Foto cortesía de Dulan Ranga).

1992). The amount of leaf litter on the ground was thick and wet. The canopy cover is about 70% and the undergrowth was very poor. The soil is soft and it contains blackish brown earth. The dominant tree species are *Madhuca fulva* (Family: Sapotaceae), *Mangifera zeylanica* (Family: Anacardiaceae), *Dipterocarpus zeylanicus* (Family: Dipterocarpaceae), *Mesua ferrea* (Family: Clusiaceae), and *Shorea zeylanica* (Family: Dipterocarpaceae).

RESULTS

An adult male *Otocryptis wiegmanni*[A] (SVL 65.2 mm) was observed on 27 June 2005, at about 11:40 h while it was lying on the ground. The temperature and the humidity at that time were 27.5 °C and 81%, respectively. The weather was sunny. Here we describe the territorial behaviour of *O. wiegmanni* in five successive steps.

Attacking

On that time, another adult male *O. wiegmanni*[B] (SVL 63.8 mm) was running towards the [A] (occupant) and stopped about 3 m away from it. Then [A] faced to [B] (invader) while expanding its dewlap (Fig. 3a). They stayed looking at each other while puffing their bodies, expanding and compressing their dewlaps for about 1 minute.

Appalling

At once both males ran towards each other by pedally about 1

m and stood by their hind limbs for about another 1 minute (Fig. 3b). After that, there was about 1 m distance between them. During this period they were expanding and compressing their dewlaps rapidly approximately four to six times per minute and kept the dewlap expanded for approximately 1 second. Their tails were lifted up and they appeared suddenly with black and white bands that became more prominent. The body colour was distinct with yellow, black, white and green. Their hearts were fluttered fast and both lizards breathed deeply.

Struggling

After the appalling step, the both males jumped forward again and knocked against each other while booting with their hind limbs (Fig. 3c). Both males jumped towards each other from about 0.5 m. The collision was so powerful that they were thrown off on either side. Afterwards, both males retreated to about 1 m away from each other. Then they rested while expanding and compressing their dewlaps for 30 seconds, approximately two to four times, and kept the dewlap expanded for approximately 5 seconds. Again they jumped forward, knocked against each other and retreated to 1 m. Likewise, they repeated this action 10 times for 30 seconds each time, to rest.

Savaging

After the struggling step, both males jumped forward again and bit each other without knocking and booting. But both individuals

were trying to escape other's biting. Afterwards, they pushed each other using their hind limbs. During this savaging period they were conglomerrated and rolled while snapping each other (Fig. 3d). However, this action was restricted to only 30 seconds at each time. At once they escaped from each other and retreated to about 1 m away. Then they rested while expanding and compressing their dewlaps for about 30 seconds. Again, they jumped forward and bit each other while conglomerrated and rolling. Likewise they repeated this action 4 times for about 30 second each, to rest. Here the most interesting thing was always that they bit only other's forelimb (especially upper arm) and [B] was severely bitten by [A], but we could not observe any damages.

Chasing

In the middle of savaging [B] was escaping. It had run towards a tree (height: 2 m), which was about 3 m away and climbed onto a horizontal branch 1 m above ground level. Therewith [A] had followed/chased [B] and also climbed onto the same tree. Then, the chasing male [A] pushed [B] down from the branch. At once [B] ran about 5 m away from the tree base. After that [A] jumped down from the tree and stayed at the tree base, but it did not chase [B] thereafter.

After escaping of [B], both of their flaming body colours were disappearing steadily within about two minutes. After this observation, we examined whether there were any females

near them. However, no females were recorded in 100 m² area. We could find only five juveniles within that area. Here the larger lizard [A] fought well and banged to the [B] unexpectedly. It seems to us that [A] was stronger than [B] while [B] fought confused and may fed up at the beginning. At the struggling stage, they fought using limbs as well as the anterior part of the lower jaw. During resting periods, they stayed steady. And also their fighting were restricted to, maximum, 30 seconds time periods.

DISCUSSION

In previous observations, we noticed some occupants and invaders escape during the struggling stage. They knocked against each other once or twice and suddenly escaped. Therefore, we believe this struggling stage may help each other to estimate the strength of their enemy. If an individual lizard realizes that it is not capable of fighting with its opponent, it may retreat. Apart from these observations, some invaders try to fend off their enemy before attacking. During these situations, invaders were expanding and compressing their dewlaps approximately 10 times per minute and kept the dewlap expanding for approximately 1 second rapidly before entering to the occupant's territory. And also some times the occupant expanded and compressed its dewlap to announce its territory to the invader before its attack.

During the fight, their tails appeared suddenly with black,



FIG. 2. A mature male of *Otocryptis wiegmanni* while compressing its dewlap (Photo courtesy of Vimukthi Weeratunge).
Macho adulto de Otocryptis wiegmanni comprimiendo su saco gular (Foto cortesía de Vimukthi Weeratunge).

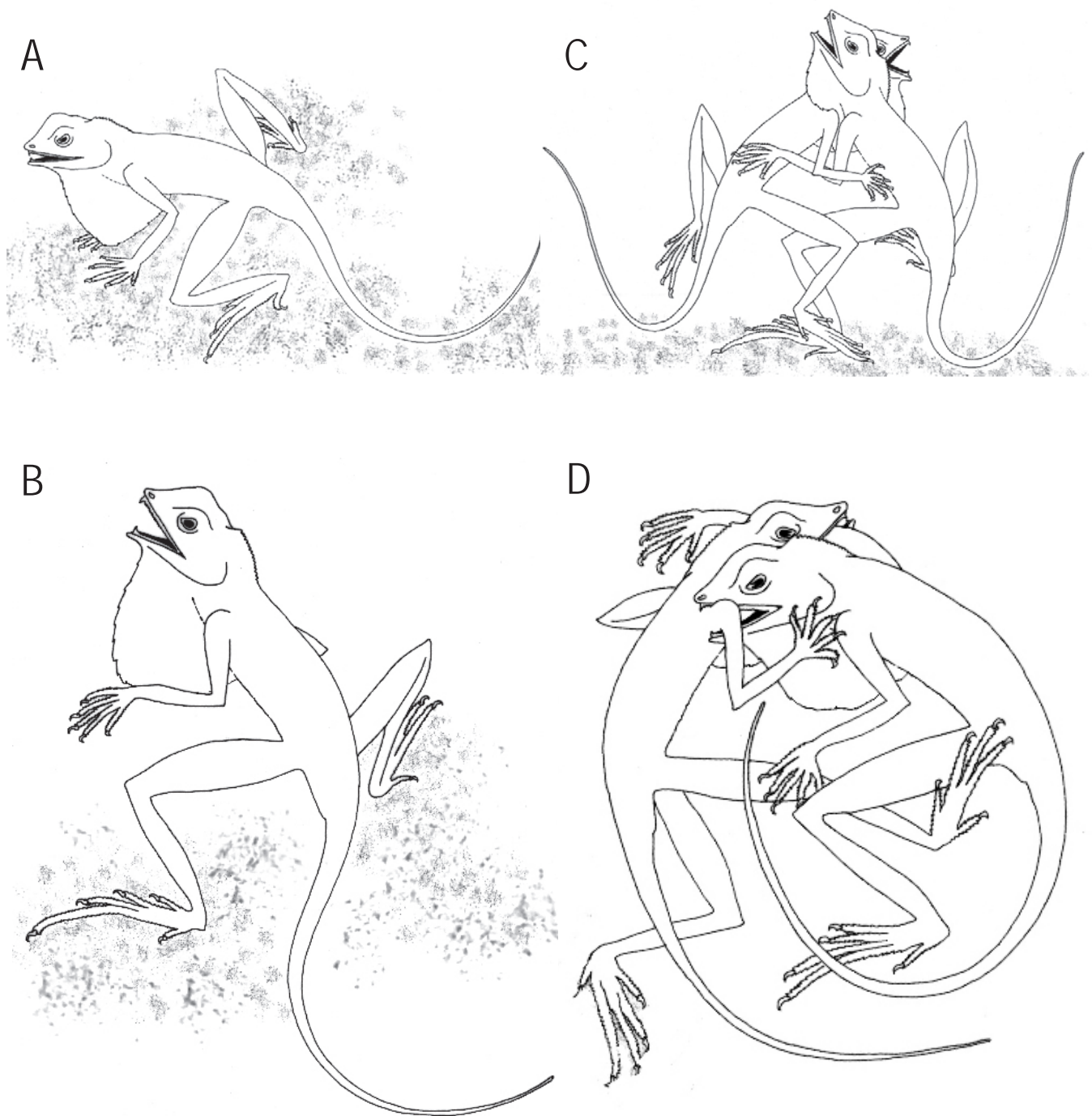


FIG. 3. *Otocryptis wiegmanni* (a) facing to invader while expanding its dewlap; (b) appalling while standing on its hind limbs; (c) struggling while knocking against each other; (d) savaging while conglomerating and rolling each other.

Otocryptis wiegmanni (a) enfrentando a invasor mientras expande su saco gular; (b) amedrentando mientras se para sobre sus patas traseras; (c) luchando mientras se golpean uno contra el otro; (d) embistiendo mientras se conglojera y ruedan uno sobre el otro.

and white bands became more prominent. Therefore, we assume this behaviour and colours may provide a window to get released from any potential predators during the fight.

This would be an interesting note because not many behavioral observations are documented on Sri Lankan lizards. And also, we hope these observations may help for

the scientific conservation of this species in the future, as well as furthering observations on other agamid lizards.

ACKNOWLEDGMENTS

The authors wish to thank Ulrich Manthey, Kelum Manamendra-Arachchi (WHT) and two anonymous reviewers

for providing valuable comments and helping to improve the manuscript, and would like to express their sincere thanks to Vimukthi Weeratunge and Dulan Ranga for providing excellent photographs of *Otocryptis wiegmanni* in life.

REFERENCES

- Bahir, M.M. and A. Silva. 2005.** *Otocryptis nigristigma*, a new species of agamid lizard from Sri Lanka. The Raffles Bulletin of Zoology, Supplement No. 12:393-406.
- Bahir, M.M. and T.D. Surasinghe. 2005.** A conservation assessment of the Agamid lizards of Sri Lanka. The Raffles Bulletin of Zoology, Supplement No. 12:381-392.
- Deraniyagala, P. E. P. 1953.** A Coloured Atlas of Some Vertebrates from Ceylon. Tetrapod Reptilia, Volume 2, National Museums of Sri Lanka. The Ceylon Government Press. Colombo, 101 Pp.
- Gunathilake, I.A.U.N. and C.V.S. Gunathilake. 1990.** Distribution of floristic richness and its conservation in Sri Lanka. Conservation Biology 4(1):21-31.
- Manamendra-Arachchi, K., A. de Silva and T. Amarasinghe. 2006.** Description of a second species of *Cophotis* (Reptilia: Agamidae) from the highlands of Sri Lanka. Lyriocephalus 6: Supplement No. 1:1-8.
- Manamendra-Arachchi, K. N and S. Liyanage. 1994.** Conservation and distribution of the Agamid lizards of Sri Lanka, with illustrations of the extant species. Journal of South Asian Natural History 1(1):77-96.
- Ranasinghe, P.N. and A. Ratnayake. 1992.** Flora & Fauna of Dombagaskanda Forest Reserve, A preliminary survey for its conservation. Young Zoologists' Association of Sri Lanka, National Zoological Gardens, Dehiwala, Sri Lanka, 33.