

Scientific note

New size record of the snake genus *Liophidium* by the island endemic *L. mayottensis*

(Squamata, Lamprophiidae)

Oliver Hawlitschek^{*,**}, Cynthia Y. Wang-Claypool^{***}, Mark D. Scherz^{*},
Ludovic Montfort^{*}, Olivier Soumille^{****} & Frank Glaw^{*}

Species or populations endemic to islands often differ from their mainland relatives in body size, a phenomenon known as island gigantism or dwarfism, respectively and often explained by general evolutionary tendencies known as the ‘island rule’ or by selection imposed by the size of available prey items (Boback & Guyer 2003, Keogh et al. 2005). This has also been discussed for the endemic snakes of Mayotte, an island system that forms part of the volcanic Comoros Archipelago in the Western Indian Ocean (Hawlitschek et al. 2012): all three endemic non-typhlopoid snake species, *Lycodryas cococola*, *Ly. maculatus* and *Liophidium mayottensis*, are larger than their mainland (i.e., Madagascan) relatives.

Previously *Li. mayottensis* (Fig. 1) was known only from two localities from higher altitudes on the main island of Mayotte, Grande Terre (Hawlitschek et al. 2011). New observations of the diurnal species from lowland sites on smaller islands of Mayotte were obtained during field surveys for the delimitation of ZNIEFF zones in Mayotte on behalf of the DEAL May-

otte (Hawlitschek & Glaw 2013, Wang et al. 2016). We found a dead specimen (ZSM 394/2014) at the beach of Moya (Petit Terre Island, 12.7835°S 45.2973°E, 15 m a.s.l., on 17 November 2014), a further specimen (ZSM 258/2013) was found dead on the beach of Bandrelé island (12.9012°S 45.2324°E, 12 m a.s.l., on 11 March 2013) by N. Verneau, and a living individual was observed by S. Soufou near the coast at Tsingoni (12.7903°S 45.0978°E, 52 m a.s.l., on 22 February 2016). These re-



Fig. 1. *Liophidium mayottensis*, ZSM 1693/2008, from Mt. Benara.

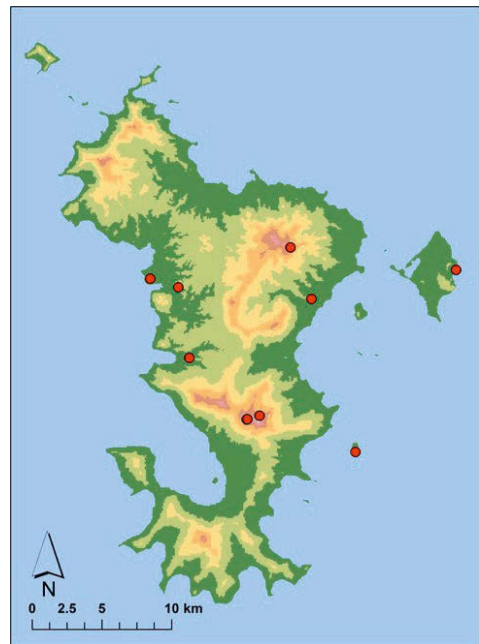


Fig. 2. Map of the distribution of *Liophidium mayottensis* on Mayotte.

* Oliver Hawlitschek, Mark D. Scherz, Ludovic Montfort & Frank Glaw, Zoologische Staatssammlung München (ZSM-SNSB), Münchhausenstr. 21, 81247 München, Germany

** Oliver Hawlitschek, Institut de Biologia Evolutiva (CSIC-Universitat Pompeu Fabra), Passeig Marítim de la Barceloneta 37, 08003 Barcelona, Spain

*** Cynthia Y. Wang-Claypool, Museum of Vertebrate Zoology, 3101 Valley Life Sciences Building, University of California, Berkeley, California, USA

**** Olivier Soumille, Bureau d'Études ESPACES, 11, Centre Amatoula, BP 168 Z.I. Kawéni, 97600 Mamoudzou, Mayotte

cords demonstrate the occurrence of this species in coastal habitats (Fig. 2).

An additional specimen (ZSM 404/2014) was collected from the road RN2 near Coconi by A. Pibot and O. Soumille in February 2000. This specimen has a snout-vent length of 79.5 cm and a tail length of 32.6 cm (total length 112.1 cm). It is therefore the largest recorded individual of *Li. mayottensis*, the largest of the genus *Liophidium* (a genus comprising nine described species from Madagascar of 238–726 mm total length and one species from Mayotte) and the largest observed terrestrial reptile of the Comoros. Table 1 compares the measurements of recent and historical specimens.

Despite substantially increasing the distribution knowledge of this species, we emphasize that it is still listed as Critically Endangered on the National Red List (though only listed as Endangered in the IUCN Red List) and should receive the highest priority of conservation. It is rarely encountered, and often killed by local people upon sight. Conservation measures, as proposed in Hawlitschek & Glaw (2013) and in Wang et al. (2016) will likely be the key to its continued survival on Mayotte.

Acknowledgements. We thank S. Soufou and N. Verneau, Mayotte, for providing records and G. Decalf, DEAL Mayotte, for help with the management of the surveys and the obtaining of permits. An anonymous reviewer provided valuable comments.

References

Boback, S. M. & Guyer, C. 2003. Empirical evidence for an optimal body size in snakes. *Evolution* 57: 345–351.
 Hawlitschek, O., Brückmann, B., Berger, J., Green, K. & Glaw, F. 2011. Integrating field surveys and remote sensing data to study distribution, habitat use, and conservation status of the herpetofauna of the Comoro Islands. *Zookeys* 144: 21–79.

Table 1. Measurements of specimens of *Liophidium mayottensis* in cm. SVL, snout-vent length; TL, tail length; ZSM, Zoologische Staatssammlung München; MNHN, Muséum National d’Histoire Naturelle, Paris. *, measurements from Hawlitschek et al. (2012).

Specimen	Sex	SVL	TL	TL/SVL
MNHN 1884-507*	?	67.7	27.1	0.40
MNHN 1884-508*	?	57.0	24.3	0.43
MNHN 1986-1387*	?	62.0	15.0	0.24
MNHN 1887-74*	?	37.0	16.8	0.45
MNHN 1884-509*	?	52.0	21.2	0.41
MNHN 1956-112*	?	69.7	28.1	0.40
MNHN 3391*	?	68.5	25.5	0.37
ZSM 258/2013 (FGZC 4966)	F	73.0	17.8	0.24
ZSM 1693/2008 (FGZC 3220)*	M	61.5	25.6	0.42
ZSM 394/2014 (FGZC 4984)	M	59.5	24.6	0.41
ZSM 404/2014	M	79.5	32.6	0.43

-- & Glaw, F. 2013. Determinant species of reptiles and amphibians for the delimitation of ZNIEFF zones in Mayotte. Unpublished report on behalf of the DEAL Mayotte, 46 pp.
 -- , Nagy, Z. T. & Glaw, F. 2012. Island evolution and systematic revision of Comoran snakes: why and when subspecies still make sense. *PLoS ONE* 7: e42970. DOI:org/10.1371/journal.pone.0042970
 Keogh, J. S., Scott, I. A. W. & Hayes, C. 2005. Rapid and repeated origin of insular gigantism and dwarfism in Australian Tiger Snakes. *Evolution* 59: 226–233.
 Wang, C. Y., Scherz, M. D., Montfort, L. & Hawlitschek, O. 2016. Complementary herpetological surveys to complete the ZNIEFF database of Mayotte: results. Bavarian State Collection of Zoology on behalf of the prefecture of Mayotte (French overseas department), Direction de l’Environnement de l’Aménagement du Logement (DEAL), 31 pp.