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# AHN

## AFRICAN HERP NEWS

HAA
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The HAA is dedicated to the study and conservation of African reptiles and amphibians. Membership is open to anyone with an interest in the African herpetofauna. Members receive the Association's journal, *African Journal of Herpetology* which publishes review papers, research articles, and short communications – subject to peer review and *African Herp News*, the newsletter which includes short communications, natural history notes, book reviews, bibliographies, husbandry hints, announcements and news items.

## NEWSLETTER EDITOR'S NOTE

Articles shall be considered for publication provided that they are original and have not been published elsewhere. Articles shall be submitted for peer review at the editor's discretion. Authors are requested to submit manuscripts by e-mail in MS Word '.doc' or '.docx' format.



**COVER PHOTOGRAPH**:

*Bitis atropos*

Photograph by: Gary Kyle Nicolau. Awarded second prize in the 14th HAA Conference photography competition.

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# AHN EDITORIAL

2020 has been quite a year for many, seemingly filled with many highs and even more lows than other years, and now this global pandemic—and we're only a quarter of the way through. Because of all of this, I felt the urgency and responsibility to get this newsletter to you. I hope it will educate you, entertain you, and simply bring some normalcy into your life. I also hope it inspires you to write and submit your own contribution for an upcoming newsletter. Rarely do we find ourselves with enough time to capture our interesting observations on paper, but the mandatory lockdown many of us find ourselves in could provide just that. And in such an instance, I want to draw your attention to the NEW EMAIL ADDRESS for newsletter submissions… newsletter@africanherpetology.org.

In order to make the transition easier for everyone, there will be a grace period of six months where the submissions and queries sent to the old email address (africanherpnews@gmail.com) will be forwarded to the new address. However, I strongly encourage all of you to make the change immediately.

Not only has the newsletter address changed, but so has the email addresses for many of the HAA committee member portfolios (see page 2). You will also notice substantial changes to the HAA committee itself. This new committee made the decision to change email addresses to assist with the seamless handover of committee portfolios going forward; and, in doing so, improve upon the organization's functionality, as well as its overall professional image. We hope this does not cause you any inconvenience and that you will see it as a positive change for the organization.

Until the next newsletter, I hope these coming months are filled with more positive changes, personal rejuvenation and, above all, a lot more herping even in the confines of your own home.

*Jessica da Silva*

Editor

# AHN ANNOUNCEMENTS

The *African Journal of Herpetology* produces two issues per year – June and December. To increase the likelihood of your article making it into the next issue (if accepted), the last date for submissions is 15 March And 15 September, respectively. Publication is also dependent on prior manuscript line—up given that there are limited page numbers per issue.

*Ché Weldon*

Journal Editor

# AHN CORRECTIONS

Correction to Issue 72, page 26 – Student Issues Report

The affiliation of Mr. Frans Reynecke, who was awarded an HAA Conference Student Grant, should have been University of Pretoria.

# MARGARETHA DELINA HOFMEYR IN MEMORIUM

Brian T. Henen

Among the rich, diverse wildlife of the Mother Continent, South Africa's tortoise diversity reigns king.

In Africa's vast landscape and lore of lions, leopards and elephants, Margaretha Delina Hofmeyr (Retha) heartily embraced the tremendous challenge to understand and conserve the world's richest diversity of tortoises.

Retha was born in Kimberly, South Africa, and studied springbok and sheep physiology for her Master of Science degree at Stellenbosch University, with renowned Professor Gideon Louw conferring Retha her degree on the majestic sand dunes of Gobabeb. While lecturing full-time at the University of the Western Cape (UWC), Retha completed her PhD on ungulate thermoregulation at the University of Cape Town.

Continuing at UWC, a historically black university, Retha persevered as young woman in a primarily male faculty, during socially turbulent times in South Africa. Dedicated and determined, Retha lectured numerous zoology courses in two languages, and supervised post-graduates researching marine species and small mammals. As an exemplary champion of merit, Retha became Head of UWC's Department of Zoology in 1990.

Figure 1. Retha was truly in her element outdoors in nature, particularly with chelonians like hinge-backed tortoises in Limpopo Province, South Africa. Photographer, Theunis Hofmeyr.

Retha's commitment to fairness, discipline and equity in mentoring students consistently brought her high praise, with many students referring to her as 'mom'. She compassionately challenged students to strive, perform their best, and achieve beyond expectation while adhering to integrity. Her students have become prominent academics, government officials and

renowned biologists. Retha had an intense understanding, respect and dedication to diversity, cultural and biological.

In the mid-1990s, encouraged by tortoise expert Ernst Baard, Retha launched an intense program investigating southern Africa's tortoise diversity and conservation. With Ernst, Gerald Kuchling, Uwe Fritz and a slew of post-graduate students and other colleagues, Retha significantly broadened worldwide understanding of chelonian (turtle and tortoise) evolution, ecology and physiology.

Within genetic, morphological, paleontological, climate and habitat constructs, these insights help us understand the deep evolutionary path and forces leading to southern Africa's rich chelonian diversity. The findings also broadened worldwide perspectives of turtle and tortoise reproduction, nutrition and life-history strategies.

As an indefatigably loving wife to Theunis and mother to Michael, Isabella and Lize, Retha inspired them all to love and be ambassadors of skilpadjies (little tortoises). She also inspired Theunis and Lize to become superb tortoise field biologists, Isabella's passion for biodiversity and conservation legal services, and Lize's art and scientific illustrations of tortoises and flora. In matching Retha's keen sense of humor, her children often jokingly complained about feeling they needed to compete with tortoise favourites, such as #253, for Retha's affection.

Retha's drive and compassion infused her desire for nature conservation, propelling her to be the pillar of Chelonian Biodiversity and Conservation in southern Africa. The Geometric Tortoise (*Psammobates geometricus*), a Critically Endangered species, was always Retha's central focus. Its dire status compelled Retha to establish the first headstart program for Geometric Tortoises. When Retha died, only 800 wild Geometric Tortoises remained, yet she had headstarted more than 100 juveniles for release.

Retha, Theunis, Isabella and Lize worked tirelessly with the Turtle Conservancy to protect one of the last Geometric Tortoise populations from land development. Retha was instrumental in helping the Turtle Conservancy establish the Southern Africa Tortoise Conservation Trust, of which Retha was founder Trustee. In 2014, she earned the Sabin Turtle Conservation Prize. Through


Figure 2. The SATCT logo was created by Lize Hofmeyr, biologist, artist and scientific illustrator, and one of Margaretha Hofmeyr's three dearly beloved, brilliant and inspired children.

painstaking efforts, Retha orchestrated the tortoise component of South Africa's Atlas and Red List for Reptiles and led the recent IUCN Red List Assessments of all tortoises of southern Africa.

On the Mother Continent, Retha mothered her children and her students. Retha was also the mother of turtle and tortoise conservation in southern Africa. As a person of exemplary standards, productivity and compassion, Margaretha Delina Hofmeyr is a brilliant star that will continue to shine and guide us.


Figure 3. Illustration of a Geometric Tortoise by Lize Hofmeyr, biologist, artist and scientific illustrator, and one of Margaretha Hofmeyr's three dearly beloved, brilliant and inspired children.

# ON THE DISTRIBUTION AND HABITAT OF THE MASCARENE GRASS FROG (*PTYCHADENA MASCARENIENSIS*) (ANURA: PTYCHADENIDAE) IN ESWATINI AND SOUTHERN MOZAMBIQUE

R. C. BOYCOTT

During biodiversity surveys in January and February 2017, the Mascarene Grass Frog, *Ptychadena mascareniensis*, was recorded from Eswatini for the first time (Fig. 1). The surveys form an integral part of the GEF/UNDP (Global Environment Facility/United Nations Development Programme) and ENTC (Eswatini National Trust Commission) funded SNPAS project (Strengthening National Protected Areas Systems) in Eswatini. The surveys are being carried out in community areas that are located adjacent to existing protected areas. In adhering to a landscape approach to integrating land and natural resource management, one of the aims of the project is to determine the biodiversity richness in the communities bordering protected areas. No published locality records of the species based on voucher specimens occurring in Eswatini could be found, hence the publication of the present paper.

The present paper is based on nine specimens, six from southern Mozambique lodged in the Port Elizabeth Museum (PEMA7488, 7489, 7490, 7491, 7492, 7493) and three from Eswatini lodged in the Durban Natural Science Museum (DM1403, 1404, 1405). Tissue samples from two of the voucher specimens collected in Eswatini (DM1403, 1404) are being stored in the Herpetological DNA Bank at the South African National Biodiversity Institute in Cape Town.

Species identification is based on diagnostic features listed or illustrated by Poynton and Broadley (1985), Passmore and Carruthers (1995), and du Preez and Carruthers (2009) (Figs 1 & 2). These include an unbroken yellow band, thickly edged with black above and below, along the posterior surface of each thigh from the knee to either side of the vent; no uniformly light triangular patch on the snout, the light frontal area continuing posteriorly, without any definite base, as a vertebral band; light longitudinal line on upper surface of the lower leg; and two phalanges of fourth toe free of web. Additionally, calls heard in the field match those provided by Passmore and Carruthers (1995) and du Preez and Carruthers (2009) on the CDs of frog

calls accompanying the respective field guides.

Figure 1. *Ptychadena mascareniensis* from Eswatini.

Figure 2. *Ptychadena mascareniensis* showing banding on back of thigh.

The species of grass frog known as *Ptychadena mascareniensis* is believed to comprise a complex of taxa (Vences et al. 2004; Sinsch et al. 2012; Dehling and Sinsch 2013) which is not surprising when considering its continental distribution. *Ptychadena mascareniensis* in the broadest sense, is widely distributed throughout Africa where it occurs in savanna habitats from Sierra Leone to Egypt to KwaZulu-Natal, and also on Madagascar and the Mascarene and Seychelles islands (Poynton and Broadley 1985; Channing 2001; Sinsch et al. 2012; Dehling and Sinsch 2013). The phylogeny of the group has received attention over the past fifteen years with molecular studies being conducted by various authors (e.g. Vences et al. 2004; Dehling and Sinsch 2013; Zimkus et al. 2017).

The taxonomy of *P. mascareniensis sensu lato* remains unresolved. Dehling and Sinsch (2013) assessed the diversity of *Ptychadena* species in Rwanda based on re-examination of voucher specimens in museum collections. They recognized five species to which they allocated available names, one of which was *P. nilotica* (Dehling and Sinsch op. cit.). In their opinion, *P. nilotica* occurs along the Nile and in Central Kenya and Tanzania. Although Zimkus et al. (2017) describe different units within the *P. mascareniensis* complex, based solely on molecular evidence, the paper is not a taxonomic revision as diagnoses of the different units are not given and no type specimens or any voucher specimens are listed as representing those units. Despite this, Zimkus et al. (2017) are of the opinion that *P. nilotica* occurs in eastern sub-Saharan Africa, as far south as coastal Zululand. If the interpretation of Dehling and Sinsch (2013) is followed, which is based on sound assessment of quantitative morphometrics, then *P. nilotica* does not occur in southern Africa. The name *P. mascareniensis* is retained for the specimens referred to in the present paper until such time that the genus in southern Africa is studied comprehensively and revised.

In South Africa, the species is uncommon and marginal in its distribution (Minter and Passmore 2004), where it is known principally from coastal Zululand (Lambiris 1989). The southernmost record for the species is Shaka's Kraal (2931AC) (*vide* Minter and Passmore 2004). The species occurs primarily in Coastal Lowveld Grassland, but also in Mixed Lowveld Bushveld, Sweet Lowveld Bushveld and Subhumid Lowveld Bushveld (Minter and Passmore 2004). In addition to coastal Zululand, Jacobsen (1989) records *P. mascareniensis* from the former Transvaal Province in north-eastern South Africa. The species was recorded from the farm, The Hippos (2531BD), midway between Eswatini and Komatipoort (Jacobsen op cit.). The habitat at this locality represents the first record of the species from a man-created site. The species was collected from the grassy fringe of a pool in a quarry (*vide* Jacobsen 1989). The record is shown on Minter and Passmore's (2004) distribution map, and the authors stated that the break in the range is probably due to inadequate collecting rather than a real absence of the species in the intervening area.

In southern Mozambique, south of 24°S latitude, Poynton and Broadley (1985) record *P. mascareniensis* from five localities, Chimonzo (2433CD), 8 km E of Jangamo (2435AB), Macia (2533AA), Boane (2632AB) and Inhaca Island (2632BB). The species is recorded from an additional locality (2533BB), east of Xai Xai, that is plotted on the distribution map (Poynton and Broadley 1991), but is not listed in the species account or gazetteer of localities (Poynton and Broadley 1985).

During biodiversity surveys of the fish and amphibians in the Maputo Special Reserve in southern Mozambique in September and October 2001, additional records of *P. mascareniensis* were obtained that represent new distribution records for the species. Six specimens were collected and are lodged in the Port Elizabeth Museum. Three specimens (PEM A7488, 7489, 7490) were collected near the north-eastern edge of Lake Xingute (2632DB ca 26° 30' 26" S; 32° 49' 02" E; Alt. < 50 m). The locality can be described as the muddy margin of a temporary swamp with very tall reed beds which dominate at the locality. Two specimens (PEM A7491, 7492) were collected from shallow water on the western shore of Lake Maxai (2632BD ca 26° 20' 33" S; 32° 55' 39" E; Alt. < 50 m). Lake Maxai is a permanent body of water and, with a conductivity of 11 mS, is quite saline. The frogs were disturbed from amongst short, dense tussocky grass and took refuge in the water at the edge of the lake (R. Bills. pers. comm.). One specimen (PEM A7493) was collected from the edge of a pan just south of Lake Nhame (2632BD ca 26° 24' 19" S; 32° 45' 31" E; Alt. < 50 m) (R. Bills, pers. comm.). Here the habitat can be described as short grasses and sedges along the bank and with emergent aquatic plants and

water lilies (R. Bills, pers. comm.).

At the Lake Maxai locality the species occurs in saline water which, due to the lake's proximity to the coast, is not surprising. Lambiris (1989) records the species from brackish coastal pools in Zululand. Both reports suggest a degree of tolerance by *P. mascareniensis* of saline habitats. North of South Africa the habitat is described as lowland swamps and marshes in open savanna (Stewart 1967; Poynton and Broadley 1985), and along streams (Channing 2001).

In January 2017, during a field survey of the amphibians of the Shewula community, in north-eastern Eswatini, two specimens of *Ptychadena mascareniensis* were collected in the late afternoon from under a flattened metal drum lying near the edge of Mangwenya Pan (2632AA ca 26° 09' 00" S; 32° 05' 16" E. Alt. 420 m) on the Lubombo Plateau (Fig. 3). The recent record of the species in Eswatini serves to support Minter and Passmore's (2004) statement. It has shown that the gap in the distribution of *P. mascareniensis* in South Africa and Eswatini was more apparent than real. To obtain additional material a second field survey was undertaken to Mangwenya Pan in February 2017. Thirteen species of frogs were recorded from the locality, including *Ptychadena anchietae* and, another new species for Eswatini, *Phrynobatrachus acridoides*. According to Stewart (1967) *P. acridoides* is often found with *Ptychadena mascareniensis* and *Ptychadena anchietae*. On the latter occasion five specimens of *P. mascareniensis* were collected of which three were retained as voucher specimens and are lodged in the Durban Natural Science Museum collection (DM1403, 1404, 1405).

Mangwenya Pan is a permanent pan, the size of which fluctuates considerably during dry and wet summers, from about 50 m to 400 m across, according to community members. It is an open grassland pan with the emergent vegetation seldom reaching more than 100 mm above the water level. Apart from grass species, there are a few broad-leaved dicotyledonous plants that grow in the pan and there are extensive patches of water lilies. In these respects, the habitat is similar to the locality near Lake Nhame in southern Mozambique and to that described by Lambiris (1989) as the preferred breeding habitat for the species, of pans in grassy wetlands, in KwaZulu-Natal Province, South Africa.

The species emits a soft quack-like call and one needs to be within a few metres of a calling individual to be able to hear it amongst the large chorus of other species.

Figure 3. Mangwenya Pan, Lubombo Plateau, Eswatini.

The call can be likened to the territorial call of *Hyperolius tuberilinguis* which is abundant at the locality. At Mangwenya Pan, *P. mascareniensis* was observed calling from grass cover along the edge of the pan and from small islands of vegetation in shallow water, less than 20 mm deep. On the majority of occasions, cover was provided by a low-growing, broad-leaved dicotyledonous plant. The adult frogs showed a preference for clumps of this particular plant that varied in diameter from about 200 mm to 400 mm, occasionally sharing the calling site with *Hyperolius tuberilinguis*.

In South Africa, *P. mascareniensis* occurs from about sea level (Lambiris 1989) to 300 m (Jacobsen 1989; Minter and Passmore 2004). The Eswatini locality is at 420 m and represents the highest altitudinal record for the species in the southern part of its range. Further north, in Malawi, it has been recorded at altitudes between 460 m and 520 m (Stewart 1967). Considering the recorded altitudinal range for the species, it is likely that additional populations could be discovered along the Lubombo range in Eswatini and South Africa, and thereby provide a more accurate representation of the species' distribution in southern Africa.

## ACKNOWLEDGEMENTS

Thanks are due to the SNPAS project, in particular the former project director, Thulani Methula, and the former Director of Parks, Wisdom Dlamini, Eswatini National Trust Commission, for support and for providing the opportunity to survey the amphibians in the Shewula community and for permission to publish this paper. For assistance in the field thanks are due to Leonard Shabangu and Judy Boycott. The Shewula community is thanked for providing accommodation at the Shewula Mountain Camp. In southern Mozambique James Culverwell facilitated the fish and amphibian surveys of the Maputo Special Reserve. Roger Bills is thanked for assistance in the field, the water analysis from Lake Maxai, and for providing habitat photographs from the Maputo Special Reserve. Angelo Lambiris' encouragement and assistance in obtaining relevant references are gratefully acknowledged. Leigh Richards is thanked for providing access to the Durban Natural Science Museum collection.

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# OBSERVED REPTILE SURVIVAL AND MORTALITY FOLLOWING A SMALL GRASSLAND MANAGEMENT FIRE

P. R. JORDAAN, P. U. ELS, J. WEIDEMAN & J. C. A. STEYL

Quantified observations on the direct effects of burning management on reptiles are rare (Erwin and Stasiak 1979; Wright 1988; Smith et al. 2012).

The continued publication of fire-induced faunal mortality or survivorship observations across species assemblages aid in understanding the direct impact of fire management on different faunal groups across habitat types and fire regimes (Smith et al. 2012). Interactions between vegetation combustion with species specific traits, the physical condition of animals, and environmental factors manifest as either fire associated faunal injury/ casualty or survivorship. Some studies have even used such fire events to derive minimum population densities and relative abundances for selected reptile species (e.g. Bruton and Haacke 1980; Boycott 2015). Here we report on the observed results regarding minimum reptile density, as well as fire-induced reptile mortality and survivorship as derived from a single survey conducted within Highveld grassland directly following the burning of a firebreak in the early austral winter on Rietvlei Nature Reserve (RNR), Gauteng, South Africa.

RNR spans 4500 ha of Carletonville Dolomite Grassland (Mucina and Rutherford 2006) surrounded by urban habitation. Several fire breaks with a maximum width of 10 m are created annually throughout the reserve by controlled burning along internal road networks, to prevent the unhindered spread of unplanned fires. Four observers slowly walked 50–100 m behind the fire front, conducting intensive active searches for surviving and deceased reptile through the entire burned area. Searches included the lifting of all moveable cover objects, primarily rocks, within the burn scar. All encountered reptiles were recorded along with the type of refugia or microhabitat where they were observed. Reptile abundance was not assessed before burning took place as lifting cover was considered a potential disturbance which may impede the buffering effect of undisturbed rocks and stable microhabitats under them to fire, whilst potentially driving animals out of the area marked for burning and surveying, impacting post fire survey results. The removal of herbaceous vegetation by fire also exposed all above ground rocky refugia, much of which was covered or obscured before the burn. Fire associated reptile mortalities were collected, photographed, externally examined, and dissected into cross sections for fixation in 10% buffered formalin. These tissues were processed for routine light microscopic histological examination through haematoxylin and eosin staining (as described in Bancroft and Gamble 2002), attempting to identify lesions indicating mechanisms of mortality (e.g. Jordaan et al. 2019; Jordaan et al. 2020). Such analyses also provided information on the physical condition of collected casualties. Wind speed ($m.s^{-1}$), humidity (%) and ambient temperature (°C) were recorded every 15 minutes for the duration of the burn with a Kestrel FW 3500 handheld weather meter.

Burning took place on the 20th of June 2017 between 10:05 and 13:10. During the burning period humidity decreased from 53.8% to 37.1%, and ambient temperatures increased from 17°C to 22°C. A mean wind speed of 2.32 $m.s^{-1}$ was recorded for the fire period with the mean fire front rate of spread calculated at 0.15 $m.s^{-1}$. The length of the fire break was 1650 m and covered an estimated total area of 1.6 ha.

The survey produced 63 reptiles from 10 commonly occurring species (Table 1). All live animals were found sheltering under rock cover. Seven of the 10 encountered reptile species are considered surface dwelling in nature, although the sample was dominated by the "semi-burrowing" (*sic* Branch 1998) species *Panaspis wahlbergi* (Smith 1849). Two fire-induced reptile mortalities were located: a female *Causus rhombeatus* (Lichtenstein 1823) was collected from among partially combusted green grass in a slight muddy depression; and a male *P. wahlbergi* specimen was found between a rock and a burned grass tussock. Maximum fire-induced reptile mortality density was calculated at 1.25 mortalities per hectare and 0.63 *P. wahlbergi* fatalities per hectare. Maximum mortality rate for all reptiles derived from the sample was 3.17% whilst maximum mortality rate in the

Table 1. Fire associated survivorship and mortality observed for reptiles following the 2019/06/20 fire break on Rietvlei Nature Reserve.

| Species | English | Live | Mortalities |
|---|---|---|---|
| *Afrotyphlops bibronii* | Bibron's Blind Snake | 1 | 0 |
| *Aparallactus capensis* | Black-headed Centipede-eater | 2 | 0 |
| *Boaedon capensis* | Brown House Snake | 1 | 0 |
| *Causus rhombeatus* | Rhombic Night Adder | 1 | 1 |
| *Pachydactylus affinis* | Transvaal Gecko | 8 | 0 |
| *Panaspis wahlbergi* | Wahlberg's Snake-eyed Skink | 42 | 1 |
| *Psammophis brevirostris* | Short-snouted Whip Snake | 1 | 0 |
| *Trachylepis capensis* | Cape Skink | 2 | 0 |
| *Trachylepis punctatissima* | Montane Speckled Skink | 1 | 0 |
| *Trachylepis varia* | Eastern Variable Skink | 2 | 0 |
| **Subtotal for recorded live and deceased reptiles** | | **61** | **2** |
| **Total number of reptiles encountered** | | | **63** |

resident *P. wahlbergi* population, the most abundant species in the sample was calculated at 2.27%.

The *C. rhombeatus* specimen exhibited no macroscopic visible external injuries. The specimen was found with its mouth open and the body contorted in an upside-down position. Macroscopically dorsal cutaneous connective tissue liquefaction was evident from histopathological assessments as well as acute myocardial fibre necrosis (Fig. 1). A large section of the liver exhibited acute necrosis (Fig. 2). No inflammatory response was observed, indicating a terminal event as the mechanism of hepatic necrosis. Denuded tracheal epithelial ciliation associated with minor pulmonary oedema was present. The lung was atelectatic without significant pulmonary oedema. Optimal body fat reserves were present although the gut was empty. The specimen was in the advanced preparatory stages of ecdysis exhibiting milky blue eyes.

External examination of the *P. wahlbergi* specimen revealed obvious thermal injury as portions of the skin appeared discoloured. Histopathological analyses of the specimen revealed extensive typical thermal injury to dermal tissue. Connective tissue liquefaction resulted in epidermal separation from coagulated subepidermal collagen (Fig. 3). The lungs were atelectatic with minor pulmonary oedema. Tracheal epithelial ciliation appeared lost potentially from the inhalation of heated gasses. The central nervous system showed evidence of thermal modification with the spinal cord visibly degenerated and the subcranium brain tissue liquefied. Oral musculature exhibited thermal injury. Testes were active but no spermatozoa were observed in the epididymis, indicating possible mating preceding death.

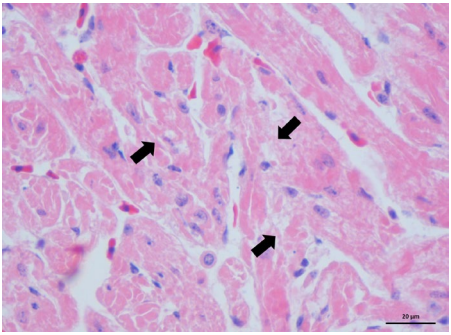

Figure 1. Myofibrillar hypereosinophilia and fragmentation (arrows) with scattered karyorrhexis in the *Causus rhombeatus* fire mortality. (Photomicrograph, 400x magnification, haematoxylin and eosin staining)

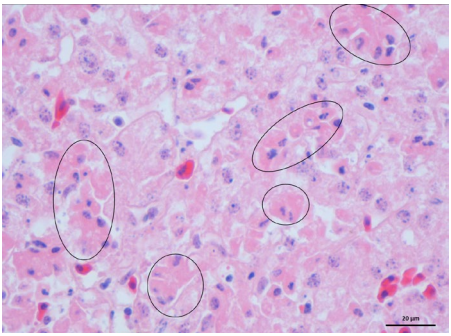

Figure 2. The liver of the *Causus rhombeatus* fire fatality with multifocal acute hepatocellular necrosis characterised by cytoplasmic shrinkage, hypereosinophilia and karyorrhexis (circles) (Photomicrograph, 400x magnification, haematoxylin and eosin staining).

This observation, reports on a specific reptile assemblage and its associated responses to a small-scale fire used in preventative fire management within Highveld grassland. Factors such as the nature of the habitat, fire size, intensity and the season when burning takes place, have been shown to influence the extent of reptile survivorship (Engstrom 2010). Minor fires such as this firebreak, is considered small enough for most animals to escape its negative effects (Whelan 1995; Boycott 2015), whilst lower ambient temperatures during winter periods are generally considered to depress reptile activity, with torpor refugia potentially shielding animals from the effects of habitat combustion compared to warmer periods of higher activity (Brook and Griffiths 2004; Beaupre and Douglas 2012; Boycott 2015).

All live reptiles were encountered under rock cover, illustrating the buffering effect of rock based refugia to fire effects (e.g. Wright 1988). From the observations derived from this survey, a minimum total reptile density of 38.75 individuals per hectare was calculated (number of reptile observations/total area of the burn in ha) with a minimum density of 26.88 *P. wahlbergi* per hectare. The actual density of reptiles is certainly higher than our derived estimates, as some reptiles fled from the fire or sheltered in burrows instead of seeking shelter under rocks situated in the burn-scar, evading assessment.

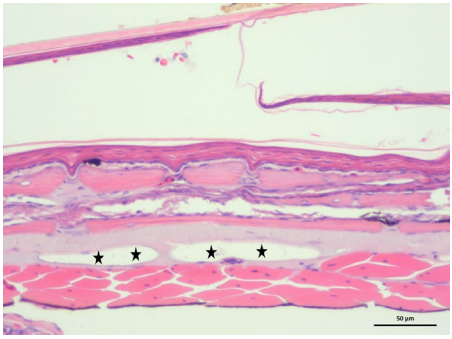

Figure 3. Skin and subcutis of the *Panaspis wahlbergi* fire fatality showcasing thermal injury induced subosteodermal vesiculation (stars) (Photomicrograph, 200x magnification, haematoxylin and eosin staining).

Strictly fossorial species (e.g. *Afrotyphlops bibronii*, Smith 1846), detected in low densities during the survey (n=1), were not adequately quantified as specialised techniques are required to survey soil living taxa (e.g. Maritz and Alexander 2008). Total reptile mortality rate could consequently be lower than our derived estimates. Both analysed specimens which succumbed to fire exhibited different signs of thermal injury and asphyxiation. Ecdysis has been implicated as a factor preventing the early detection of fires by snakes, dulling senses and hampering escape leading to casualty (Beaupre and Douglas 2012) which would explain the inability of the examined *C. rhombeatus* specimen to evade even this relatively small narrow fire. This observation conforms to current opinions and suspicions regarding the direct effect of small-scale fires on reptiles, considered to produce low mortality rates.

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# SECOND RECORDED OCCURRENCE OF THE ASIAN COMMON TOAD *DUTTAPHRYNUS MELANOSTICTUS* (ANURA: BUFONIDAE) IN SOUTH AFRICA

W. R. SCHMIDT, W. K. DICK & N. EVANS

The Asian Common Toad or Black-spined Toad (*Duttaphrynus melanostictus*) (Schneider, 1799) is widely distributed across much of Asia, from Pakistan in the west to Vietnam and China in the east. It also occurs in Malaysia (AmphibiaWeb, 2019). It has been identified as highly invasive outside its natural distribution range, with invasive populations in Bali (Church 1960); Timor-Leste (Trainor 2009); New Guinea and Madagascar (Kolby 2014; Moore et al. 2015; Pearson 2015). It is regularly transported in shipping consignments from Asia and individuals have been discovered in Australia (Mo 2017), Mauritius and South Africa (Measey et al. 2017). In December 2012, an individual was discovered in a consignment of furniture in Tokai, Cape Town (Measey et al. 2017). We here report on a second known individual discovered in a shipping container at the Bluff, Durban, KwaZulu-Natal, South Africa (Figs 1 & 2).

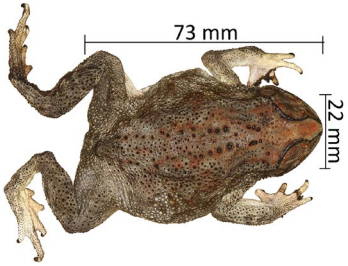


Figure 1. Dorsal aspect of PEM A14252 *Duttaphrynus melanostictus*.

Figure 2. Ventral aspect of *Duttaphrynus melanostictus*.

## SECOND RECORDED SPECIMEN FROM SOUTH AFRICA

An adult *Duttaphrynus melanostictus* was discovered on 14 October 2018 and handed over to the second author for identification, who in turn alerted Nick Evans from the organisation KwaZulu-Natal Amphibian and Reptile Conservation. Once identified, the authorities (Ezemvelo-KZN Wildlife), were alerted and it was jointly decided to euthanise the specimen due to its highly invasive nature and risk of disease transmission. We were unable to track the exact locality and circumstances under which the toad was discovered but it was apparently found when unpacking a shipping container of unknown origin and stated as being in the Durban harbour/Bluff area, Durban, KwaZulu-Natal, South Africa (29° 53'S; 31° 00'E).

## SPECIMEN DATA

The specimen is a female measuring snout – urostyle length of 73 mm with a body width of 46 mm (measured between the limbs at the widest point). Sex was determined after a ventral incision was made revealing a mass of eggs within the abdominal cavity, indicating that it was fully gravid at the time of discovery. Head width is 22 mm (measured diagonally between the points above the tympanum). The allocated Field Reference Number is WRS A-00338 and it has been accessioned into the Port Elizabeth Museum (Bayworld), accession number: PEM A14252.

## INVASION RISK

In a study on invasion pathways for amphibians in southern Africa, Measey et al. (2017) allocated *Duttaphrynus melanostictus* an impact category of 'major', meaning that the species poses a serious invasion risk to South Africa. *Duttaphrynus melanostictus* was first reported from eastern Madagascar on 26 March 2014 where the species has established itself near the port town of Toamasina (Pearson 2015). Dedicated surveys have indicated that it may have been introduced as early as 2009 or 2010. It has since spread to numerous localities on the periphery of Toamasina (Moore et al. 2015).

As highlighted by the Madagascan studies, and examples elsewhere, including invasions by Cane Toads (*Rhinella marina*), once toad populations are established, they are practically impossible to eradicate and spread rapidly. Therefore, preventative measures are essential in mitigating invasion risk. The climatic and ecological variables in KwaZulu-Natal are highly conducive to *Duttaphrynus melanostictus* (Measey et al. 2017). Although South Africa has a highly diverse bufonid fauna, the competitive impact or disease transmission to indigenous toads by outside contenders is unknown. The effect on predators known to consume toads such as night adders (*Causus*) and cobras (*Naja*) by invasive toads which may have different toxic compositions are also unknown.

Measey et al. (2017) indicated that southern Africa is becoming more vulnerable to amphibian invasion because of increased trade. Due to the highly invasive nature of *Duttaphrynus melanostictus* and its occurrence in Madagascar, as well as increased trade with Asian countries, it is recommended that increased awareness be disseminated to the herpetological community and conservation authorities in KwaZulu-Natal, as well as national biosecurity units and port authorities. Standard protocols should be drafted for shipping and logistics companies should they discover any biological organism inside their consignments, including the correct disposal methods, and a reporting mechanism by which alien species can be logged and information disseminated to the appropriate authorities. Specimens should be accessioned into a natural history repository for future reference.

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AHN
NATURAL HISTORY
notes

## BUFONIDAE

***Sclerophrys poweri***
(Hewitt, 1935)
Western Olive Toad

## COLOURATION

P. BERG & F. S. BECKER

Natural and sexual selection drive the diversity of communication strategies in the animal world. Colour displays can function as visual signals transmitting information to inter- and intraspecific receivers, thereby impacting the fitness of an animal substantially. For example, in the context of predation, it may be protective to blend in with the environment (camouflage) or warn potential predators (aposematism) (Rojas 2017). Moreover, visual signals can facilitate mate recognition and choice, and complement acoustic communication in anurans. Whereas conspicuous colour displays may increase an individual's reproductive success, they may at the same time increase predation risk, hence resulting in a trade-off between different selective pressures. Sexual dichromatism, a form of sexual dimorphism in which males and females differ in colour, usually results from sexual selection for conspicuous colours in males and natural selection for cryptic colours in females and its prevalence and diversity in frogs and toads is increasingly recognized (Doucet and Mennill 2010; Bell and Zamudio 2012; Bell et al. 2017). Dynamic dichromatism refers to a temporary colour change between the sexes in the context of breeding, as opposed to a permanent or ontogenetic colour change, and is probably under-documented due to its ephemeral nature (Bell et al. 2017).

In the late evening of 26 April 2014, in the rain, a female *Sclerophrys poweri* was observed sitting in a hotel garden puddle (Fig. 1A) in Oshakati, Oshana region, Namibia (17° 47' 08.1" S 15° 41' 56.4" E, 1102 m a.s.l.). The toad displayed a very distinctive red dorsal body colouration, which covered the head, back, and, to a lesser extent, limbs and lateral body parts (Fig. 1 B, C). The normal colouration of *S. poweri* is yellow-brown to olive-green with pairs of dark-edged brown or reddish-brown patches and red infusions on the hindlegs (Du Preez and Carruthers 2017). A light throat and the absence of nuptial pads on the feet suggest that the encountered individual was female.

A similarly coloured female *S. poweri*

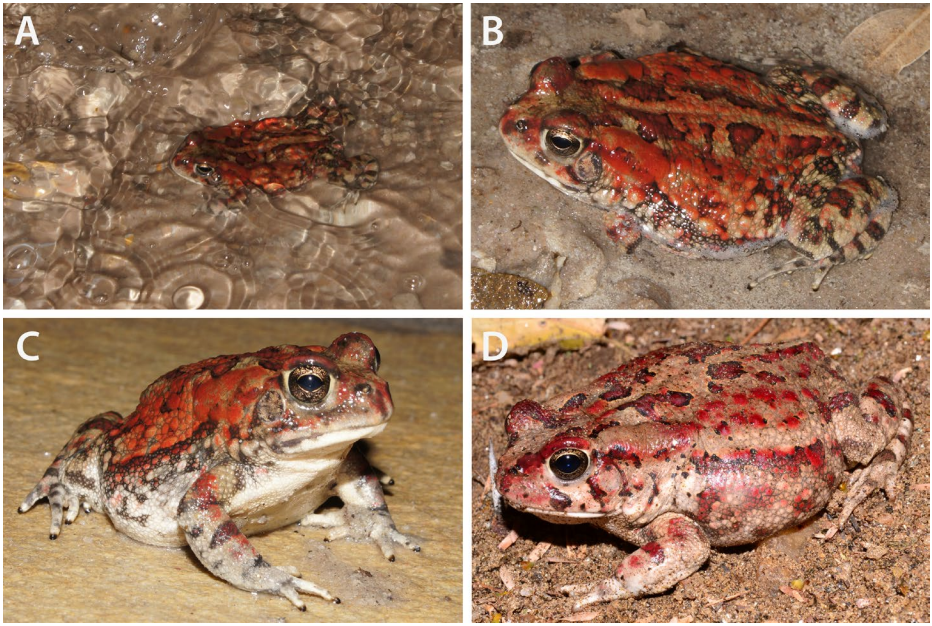


Figure 1. Conspicuous red pigmentation in the Western Olive Toad, *Sclerophrys poweri,* in Namibia. The first toad was encountered in a rain puddle in the late evening in Oshakati, Namibia (A). Dorsolateral (B) and frontolateral view (C) of the same individual. A second individual of *S. poweri* with a reddish dorsal body colouration was encountered in the rain at night in Windhoek, Namibia (D). (Photos: A–C: P. Berg; D: F. S. Becker)

was observed 550 km away in Windhoek, Khomas region, Namibia, on the first rainy night in the season on 23 October 2018 (Fig. 1D), about 10 m from a pool where these toads have been known to breed.

Both observations were made in the rain, under low light conditions. Amphibians possess two types of rod photoreceptors, which may allow for rod-based colour discrimination at very low light levels (Yovanovich et al. 2017). Bright colouration has been suggested to play a role in both sexual selection and mate recognition in nocturnal amphibians (Gomez et al. 2009; Gomez et al. 2010; Robertson and Greene 2017). While colouration linked to sexual selection is usually associated with males, the recognition of conspecifics affects both sexes, and can have several advantages in the breeding context. For example, males of the nocturnal treefrog *Hyla versicolor* are more likely to give courtship calls if they detect an approaching female (Reichert 2013), which may represent a strategy to balance the risk of being conspicuous to predators and the chances to attract attention of potential mates.

In the literature, information on the reproduction biology of *S. poweri* is scarce with the exception of Channing (2001), who states that the first rain in the season initiates breeding. Hence, there may be a link between the observed conspicuously red pigmentation and rain-triggered breeding activity. In related species breeding has been recorded at various times of the year (Conradie and Bills 2017). Anecdotal observations indicate that *S. poweri* may breed throughout spring and summer in perennial, usually artificial, water bodies, but that breeding activity is more pronounced after the first rain of the season. Although the toads were not collected and observed later, it is assumed that this colouration is temporal, because it is atypical for the species, even compared to sightings of conspecifics in Windhoek and northern Namibia. Moreover, if this conspicuous colouration was of permanent nature, the predation risk would be augmented and it seems unlikely that the individuals reached adult age. While colour or pattern polymorphism has been described for many anuran species, aberrant colour morphs characterized by an unusual reddish pigmentation (erythrism) have been reported less commonly. For example, erythristic specimens with red pigmentation confined to dorsal body parts and less pronounced on the limbs, similar to the case described here, have been documented for (female) *Bufo viridis* (Lanza and Canestrelli 2002) and for the toad *Pelobates fuscus* (Kolenda et al. 2017). Environmental factors, namely high iron concentrations in water and soil, rather than mutations affecting pigment production or chromatophores distribution, were hypothesized as a trigger in the latter case (Kolenda et al. 2017); alternative explanations, including dynamic sexual dichromatism, were not discussed.

Dynamic dichromatism has been described for males of other toads of the genus *Sclerophrys*, but not for females of any species. Males of *S. lemairii* (Lemaire's Toad) turn bright yellow during breeding periods (Bittencourt-Silva 2014; Conradie and Bills 2017) as do males of *S. kisoloensis* (Kisolo Toad), which revert to their normal colouration after a few hours (Channing and Howell 2006). According to an overview presented by Bell et al. (2017), dynamic dichromatism occurs fairly commonly in the family Bufonidae and a transient yellow or yellow-brown colouration has also been described for *S. gutturalis*, *S. maculatus* and *S. togoensis*. Other colours have been reported for male toads of the genus *Altiphrynoides,* which change to lime green or orange (Channing and Rödel 2019). However, a temporary shift to yellow coloration is by far the most common display colour in dynamically dichromatic frogs (Bell et al. 2017). If the colouration of the observed individuals of *S. poweri* represents sexual dichromatism, this case would be an exception to the norm in terms of colour and sex. While reports of "reverse"

ontogenetic sexual dichromatism (i.e., more ornate coloration in females than in males) exist, it is assumed to have evolved in species with sex role reversal (e.g., Engelbrecht-Wiggans et al. 2019; Portik et al. 2019; but see Heinsohn et al. 2005 for an exception in a bird). For dynamic sexual dichromatism, all known cases refer to a temporary colour change in breeding males but one case of mutual dynamic colour change in both males and females of the bufonid *Xanthophryne tigerinus* (Bell et al. 2017). In addition, sexual dichromatism in the Wood Frog (*Rana sylvatica*) has been shown to follow a seasonal cycle in both sexes (Lambert et al. 2017), which hence may qualify as mutual dynamic sexual dichromatism. However, research on sexual selection that acts on females has only recently started to receive growing attention (Hare and Simmons 2019).

To our knowledge, this is the first record of such a bright red colouration in this species. Although widespread and common, many questions about the biology and phylogeny of these toads remain open, and numerous cryptic species may still await their discovery (e.g., Liedtke et al. 2016). In hyperoliid frogs, for example, sexual dichromatism has been linked to accelerated diversification (Portik et al. 2019) and more information about the breeding behaviour of *S. poweri,* related species as well as regional differences could add to our understanding of the evolution of African toads.

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## CHAMAELEONIDAE

***Chamaeleo dilepis***
Leach, 1819
Common Flap-necked Chameleon

## REFUGIA

S. DAVIDSON-PHILLIPS & J. SWART

On the 25th June 2013 at 09:28am, an adult Common Flap-necked Chameleon, *Chamaeleo dilepis* Leach, 1819 was observed in the Welgevonden Game Reserve (WGR), Limpopo Province, South Africa (24º 22' 03.22'' S, 27º 51' 45.36'' E) at an elevation of 1504 m. The recorded temperature from the WGR weather station located approximately 20 km away was 12°C. The chameleon was found inside an old dried dung bolus of an African Elephant, *Loxodonta africana* (Blumenbach 1797). The specimen was found while kicking into the dung and toppling the bolus (Fig. 1) during routine fire belt preparation.

The chameleon appeared to be in a state of dormancy with eyes initially closed. It was cold to the touch and dark coloured.(Fig. 2). Dormancy has been recorded in various reptilian species and is associated with lipid storage and use, most often through winter periods (Kenneth Derickson 1976; Price 2017). Dry season dormancy/aestivation is also a well-recognised phenomenon in chameleons (Longstaff and Poulton 1907; Loveridge 1954; Broadley and Blake 1979). There have been several anecdotal reports of Common Flap-necked Chameleons "brumating" (Mitchell 1946; Raw 1993; Alexander and Marais 2008), however, this may be the first recorded observation of a Common Flap-necked Chameleon making use of elephant dung to protect itself from environmental elements. WGR is located within two vegetation types namely the

Figure 1. Common Flap-necked Chameleon (*Chamaeleo dilepis*) observed inside an old dung pile deposited by an African Elephant (*Loxodonta africana*).

Figure 2. Common Flap-necked Chameleon (*Chamaeleo dilepis*) showing the initial dark colouration shortly after disturbance.

Waterberg Mountain Bushveld (SVcb 17) and Waterberg-Magaliesburg Summit Sourveld (Gm 29) (Mucina and Rutherford 2006). Both these vegetation types are characterised by a high incidence of fires, therefore as suggested by Alexander and Marais 2008, some anecdotal reports may also suggest *Chamaeleo dilepis* seeking refuge as a strategy to escape fires.

Elephants were reintroduced to the WGR in 1995 and may be important facultative habitat modifiers for reptilian diversity. Damage to vegetation from elephant have been known to create refuge for other lizard species (Pringle 2008). Other herpetofauna have also been known to make use of mega herbivore dung piles. One such case was recorded in south-eastern Sri Lanka where three different amphibian species were found to be utilising Asian Elephant, *Elephas maximus* Linnaeus, 1758 dung as refugia (Campos-Arceiz 2009). It is highly likely that the use of mega herbivore dung piles by herpetofauna as refugia is more common than currently recorded.

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## CORDYLIDAE

### *Cordylus imkeae*
Mouton and Van Wyk, 1994
Rooiberg Girdled Lizard

## REPRODUCTION, GROWTH AND LONGEVITY

V. J. T. LOEHR

The Rooiberg Girdled Lizard (*Cordylus imkeae*) is one of the smallest species in the genus (Mouton and Van Wyk 1994; Reissig 2014). It inhabits a minute range on the Rooiberg in Namaqualand (Bates et al. 2014). Because of this species' intrinsic vulnerability and the virtual lack of published information, I collected one male, one female and two juveniles at the type locality in December 2006, for a captive study in the Netherlands.

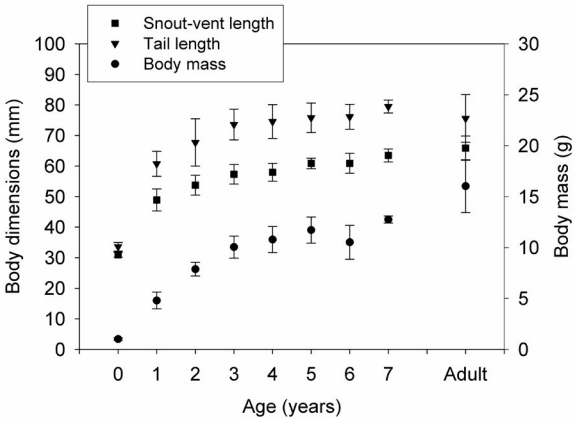


Figure 1. Snout-vent length, tail length and body mass of 11 captive-bred and four adult-collected *Cordylus imkeae*

The two juveniles represented a second couple. Both couples produced 1–3 offspring in March 2007, July–August 2008, 2009 and 2011, and September 2012 (total 11 offspring), at northern hemisphere climatic conditions (see Loehr 2010 for details). The unusually skewed sex ratio of 10 males and one female suggested that temperature-dependent sex determination had occurred. Reproduction ceased abruptly when adult couples were transferred to different enclosures, possibly caused by smaller enclosure sizes (750 x 600 x 400 mm instead of 1 500 x 600 x 400 mm). Efforts to isolate causes by adjusting annual temperature cycles and housing lizards individually, except during the mating season (i.e., April–May; Loehr 2010) when copulations were observed, failed to trigger reproduction. Nevertheless, females consistently produced infertile eggs in August–November if lizards were subjected to brumation. Brumation consisted of gradually reduced temperature and photoperiod from November until February. For three weeks in January, spotlights were switched off to reach maximum enclosure temperatures of 16–20°C. Juvenile growth was slow and it required several years before individuals reached adult body dimensions (Fig. 1). After seven years of growth, body mass still appeared lower than the body mass of the two adult couples (Fig. 1). One of the lizards that had been collected as an adult was still alive in December 2019. Assuming similar growth rates in the wild and in captivity, this lizard was at least seven years old when collected in 2006 and has reached an age of 21 years. The minimum age that the lizard has reached is 14 years. In total, 10 lizards have died during the study and some were deposited at museums, namely Leiden

Museum of Natural History (RMNH. RENA.42013 and RMNH.RENA.48680) and Zoological Museum of Berlin (ZMB 74352 and ZMB 74353). Two carcasses were discarded after post-mortem dissection and four are in the process of being deposited at Bonn Museum König. I conclude that this study has revealed several factors (i.e., enclosure size, brumation, temperature-sensitivity of embryos) that appear important for captive-breeding of the species, but predictable and consistent production of offspring was not attained.

## ACKNOWLEDGEMENTS

I am grateful to the Northern Cape Department of Environment and Nature Conservation for granting permission (0650/06) to collect and export *Cordylus imkeae*. In addition, I would like to thank Mr and Mrs Beukes for allowing me to capture lizards on their farm. Le Fras Mouton is thanked for sharing information about the type locality.

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AHN
GEOGRAPHICAL DISTRIBUTIONS

## SALAMANDRIDAE

### *Pleurodeles waltl*
Michaelles, 1830
Iberian Ribbed Newt

A. HERNANDEZ & D. ESCORIZA

The genus *Pleurodeles* is endemic to the western Mediterranean ecoregion, where three species occur, the Algerian Ribbed Newt *Pleurodeles nebulosus* and the Edough Ribbed Newt *P. poireti* in northern Algeria and Tunisia and the Spanish Ribbed Newt *P. waltl* in the Iberian Peninsula and northwest Morocco (Escoriza and Ben Hassine 2019). *Pleurodeles waltl* typically occupies dry and open habitats in plains and mid-altitude Mediterranean mountains, reaching its elevational limit in the southeast of the Iberian Peninsula, in the Baetic Mountains (Charco del Negro, 1400 m: García-París et al. 2004).

In Morocco this species is distributed throughout much of the northwestern Atlantic plain and reaches peripherally the mountain systems of the Rif (Chaouen, Tetouan) and the Middle Atlas (Plateau d'Oulmès) (Bons and Geniez 1996; Fahd et al. 2015; Hernandez 2018) at altitudes of 650 m in the surroundings of Chaouen and 1100 m in Oulmès (Pasteur and Bons 1959; Escoriza and Ben Hassine 2019; Marmol et al. 2019).

In this study we reported two new locations for this species in the Middle Atlas, including the elevational record for the species throughout its distributional range. In April 2017, four adults of *P. waltl* were found around Dayat Aoua (Ifrane; 33° 38' 23.9" N, 5° 01' 09.9" W; WGS 84 geodetic datum), at the altitude of 1484 m (Fig. 1). These adults were inactive under stones (air temperature

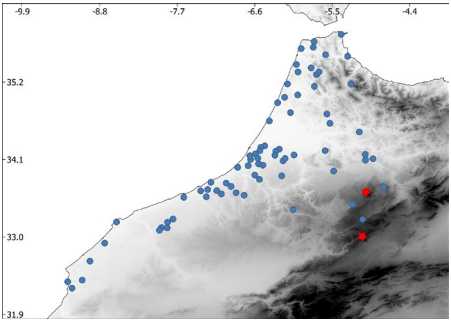


Figure 1. Map of the study region (northern Morocco). Blue circles: occurrence of *P. waltl* according to Escoriza and Ben Hassine (2019); red stars new locations of *P. waltl* described in this study.

= 25.4°C, air humidity = 66%), close to a temporary pond of 600 m² of surface (Fig. 2). The vegetation consisted of a riparian community (*Populus nigra*), surrounded by scattered formations of *Cedrus atlantica*. Other species of amphibians and reptiles observed in the area were *Bufotes boulengeri* (Bufonidae), *Hyla meridionalis* (Hylidae) and *Pelophylax saharicus* (Ranidae) and reptiles *Emys orbicularis* (Emydidae), *Mauremys leprosa* (Geoemydidae) and


Figure 2. A. Adult individual of *Pleurodeles waltl* found in Dayat Aoua, Ifrane region, Middle Atlas at 1,484 m a.s.l. B. Habitat of the species in Dayat Aoua. Pictures: Axel Hernandez.

*Timon tangitanus* (Lacertidae).

In May 2019 another adult specimen was found in the Col du Zad (Khénifra; 33° 00′ 35″ N, 5° 04′ 22″ W, 2100 m; Fig. 1). The specimen was inactive under large rocks (air temperature = 14.2°C, air humidity = 68%). The plant community consisted of alpine grasslands surrounded by some scattered trees (*Cedrus atlantica* and *Quercus ilex*). The only other amphibian observed in the area was *Bufotes boulengeri*.

These records extend the distribution of *P. waltl* to the southeast, in the Atlas mountain system, and increase the elevation range of this newt in Morocco. In Morocco this species has been cited mostly at low altitudes, below 600 m (Escoriza and Ben Hassine 2019), but these new observations indicate that it also occurs in mountainous areas, where it reaches the alpine zone In this sense, the congeneric species *P. nebulosus* also occupies mountain habitats in Tunisia and Algeria, at altitudes of 1000–1378 m (Escoriza and Ben Hassine 2015). However, *P. nebulosus* can occupy closed forests while *P. waltl* is very rare in this type of habitats.

Our observations suggest that *P. waltl* inhabits the northwest of the Atlas chain, favoring scarcely vegetated habitats, structurally similar to those it occupies in the plains. These habitats are also similar to those occupied by this species in the mountains of the Baetic System (doline ponds with scarce peripheral vegetation).

Future research has to determine whether there are other populations in the southern and eastern Middle Atlas. Apparently the species is scarce in the region, because although some parts of these mountainous systems have been intensely prospected (e.g. Ifrane surroundings; Beukema et al.

2013) *P. waltl* had never been previously recorded. This area is subject to intense agricultural and tourist development, with the consequent destruction or alteration of aquatic habitats that could damage the fragile populations of this species (Hernandez 2017).


Figure 3. A. Adult male specimen of *Pleurodeles waltl* found in the vicinity of Col du Zad, Khénifra region, Middle Atlas located at 2,100 m above sea level. B. Habitat of the species in this locality. Pictures: Axel Hernandez.

## ACKNOWLEDGEMENTS

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## GERRHOSAURIDAE

### *Tetradactylus breyeri*
Roux, 1907
Breyer's Long-tailed Seps

D. W. PIETERSEN

Breyer's Long-tailed Seps (*Tetradactylus breyeri*) is a rare, endemic, serpentiform lizard that occupies high-altitude grasslands along the eastern escarpment of South Africa (Branch 1998; Bates 2014). It remains rare in both scientific collections and in the literature, with only 31 documented occurrence records (Alexander et al. 2019). The latest conservation assessment of this species classifies it as Near Threatened, citing habitat loss and transformation as driving this species' decline (Alexander et al. 2019). Although this conservation assessment states that no recent records exist of this species in KwaZulu-Natal, Free State or Mpumalanga provinces, occurrence records in this same publication indicate that there are contemporary records in both Mpumalanga and KwaZulu-Natal provinces (Alexander et al. 2019). The current article reports on three additional recent records of this species in the Free State and KwaZulu-Natal provinces.

All individuals are referred to the genus *Tetradactylus* based on the serpentiform body, long tail, quadrangular dorsal scales and reduced limbs. Individuals are further specifically referred to *T. breyeri* based on the presence of two minute digits on the front limbs and/or distribution (Bates 1996; Branch 1998).

A single adult *T. breyeri* was found and photographed on the farm Sneeuwberg 254 (27° 44' 55" S, 29° 41' 43" E, 2729DA), Free State Province, South Africa by Darren Pietersen on 1 February 2016 at approximately 10:00 am (Figs 1 & 2). It was actively moving through short grassland

Figure 1. Breyer's Long-tailed Seps (*Tetradactylus breyeri*) photographed on the farm Sneeuwberg 254, Free State Province, South Africa. Picture: Darren Pietersen.

Figure 2. Close-up of the Breyer's Long-tailed Seps (*Tetradactylus breyeri*) from the farm Sneeuwberg 254, Free State Province, South Africa, showing the characteristic two small digits on the forelimb. Picture: Darren Pietersen.

on a rocky slope at the time of discovery. This individual was found in Eastern Free State Sandy Grassland near the ecotone with Low Escarpment Moist Grassland (Mucina and Rutherford 2006). It was photographed and released unharmed at the capture site. This record is 55 km north of the nearest previous recorded locality on the farm Boundary Slopes 11081, KwaZulu-Natal Province (Quarter Degree Square 2829BA; ReptileMAP no. 5520, available online at http://vmus.adu.org.za/?vm=ReptileMAP-5520; Bates 2014).

Matthews K. Fusi photographed an individual in Sterkfontein Dam Nature Reserve (Farm Bosch Kloof 487; 28° 31' 24" S, 28° 59' 41" E, 2828DB), Free State Province, South Africa, on 22 January 2014 (ReptileMAP no. 151035, available online at http://vmus.adu.org.za/?vm=ReptileMAP-151035). This record is from eastern Free State Sandy Grassland near the ecotone of Northern Drakensberg Highland Grassland (Mucina and Rutherford 2006). No additional information is available for this record, although the photographs suggest that it was killed by a predator or was perhaps a roadkill. This is the first record of this species in this QDS, although it has previously been recorded in the adjoining QDS (2829CA; Bates 2014).

Robyn Colyn photographed an individual at Ingula Pumped Storage Scheme (Farm Bedford 389, 28° 15' 22" S, 29° 34' 27" E, 2829BC), KwaZulu-Natal Province, South Africa on 23 October 2014 (ReptileMAP no. 152135, available online at http://vmus.adu.org.za/?vm=ReptileMAP-152135). This individual was found in short mesic montane grassland within 4 km of the nearest previous record on the farm Boundary Slopes 11081, also part of Ingula Pumped Storage Scheme (ReptileMAP no. 5520, available online at http://vmus.adu.org.za/?vm=ReptileMAP-5520; Bates 2014). Both Ingula records are in Eastern Free State Sandy Grassland near

the ecotone with Low Escarpment Moist Grassland and Northern Afrotemperate Forest (Mucina and Rutherford 2006).

These recent records suggest that *T. breyeri* does still occur in the eastern Free State and western KwaZulu-Natal Provinces, with an additional previous record indicating that this species also still persists in southern Mpumalanga Province (ReptileMAP no. 676, available online at http://vmus.adu.org.za/?vm=ReptileMAP-676; Bates 2014). It appears that this species is rare, or at least difficult to detect, and additional targeted surveys are required to determine the full extent of this species' range. The current (and other recent) records suggest that this species may now be restricted to well-managed high-altitude grasslands.

## ACKNOWLEDGEMENTS

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# AHN
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publishes manuscripts in four categories, namely Articles, Herpetological Surveys, Natural History Notes, and Geographical Distributions. The details of these categories are provided below. The newsletter will also consider publishing content that may not necessarily fit into these categories (e.g. envenomation, opinion pieces).

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The type of submission (e.g., Article, Natural History Note, Geographical Distributions) should be clearly indicated in the file name. As a general note, always use the latest available issue of AHN for instructions.

All submissions should be typewritten in English (UK spelling), set in 10 pt Calibri. Words should not be divided at the right-hand margin. Use the active voice in the first person where possible (except for submissions for *Tomorrow's Herpetologists Today*). Formatting should be achieved with paragraph settings rather than tabs or spaces. Authors should consult the *Council of Biology Editors Style Manual,* 5th edition (1994) for style and abbreviations. Sentences should be separated by a single space (character). Genus and species names must be italicised. Centre major headings in small caps. Subheadings are in bold and left justified (*also in title case*). Footnotes are not accepted. The International System of Units (Systeme Internationale; SI) should be followed. Use decimal points rather than commas. Measures should be in mm, m or km rather than cm or dm. Integers less than 10 should be spelled, while those greater than 10 (including 10) should be given numerically. Group integers of thousands together with a space and do not use a comma (e.g. 10 500 and 1 230). All statistical symbols should be italicised. Follow the Fourth Edition (1999) of the International Code of Zoological Nomenclature. Every word in English common names should start with a capital letter (e.g., Namaqua Dwarf Adder). Appendices, Material Examined, Tables, legends to Figures, and Figures must follow the References.

## ARTICLES

African Herp News publishes longer contributions of general interest that would not be presented as either Natural History Notes or Geographical Distributions. A standard format is to be used, as follows:

**TITLE** (bold, centred, upper case);

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## HERPETOLOGICAL SURVEYS

African Herp News publishes succinctly annotated species lists resulting from local surveys of amphibians and reptiles on the African continent and adjacent regions, including the Arabian Peninsula, Madagascar, and other islands in the Indian Ocean. The area surveyed may be of any size but should be defined as a geographic unit of special relevance to the herpetological community. For example, surveys should address declared or proposed conservation reserves, poorly explored areas, biogeographically important localities or administrative zones. The relevance of survey results should be judged by the extent that these records fill distributional gaps or synthesise current knowledge. As far as possible, survey records should be based on accessible and verifiable evidence (specimens deposited in public collections, photos submitted illustrating diagnostic features, call recordings and sonograms, or DNA sequences accessioned into international databases).

Survey results should be presented in the same format as used for Articles (described above), and must additionally include:

**SYSTEMATIC ACCOUNT** (bold, aligned left): comprises Scientific name (including author citation), location and habitat, evidence (including registration numbers and location of vouchers), and comments (where required).

## NATURAL HISTORY NOTES

Brief notes concerning the biology of the herpetofauna of the African continent and adjacent regions, including the Arabian Peninsula, Madagascar, and other islands in the Indian Ocean. A standard format is to be used, as follows:

**FAMILY** (bold, centred, uppercase)

***Scientific name*** (bold, italicised, centred)

Author citation (centred, and use brackets only when the current genus is different to the original genus when the taxon was described)

English Common Name (centred, all words starting with a capital letter)

**KEYWORD** (bold, centred)

**AUTHOR(S)** (initials and surname, bold, centred)

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**ACKNOWLEDGEMENTS** (bold, centred), if applicable

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The Keyword should be one or two words best describing the topic of the note (e.g., Reproduction, Avian predation, etc.).

The body of the note should include information describing the locality (Country; Province; quarter-degree locus; location; latitude and longitude in D° M' S" format; elevation above sea level), providing the date (day, month, year), naming the collector(s), and stating the place of deposition and museum accession number or describing the fate of the animal.

## GEOGRAPHICAL DISTRIBUTIONS

Brief notes of new geographical distributions of amphibians and reptiles on the African continent and adjacent regions, including the Arabian Peninsula, Madagascar, and other islands in the Indian Ocean. Records submitted should be based on specimens deposited in a recognised collection. A standard format is to be used, as follows:

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Author citation (centred, and use brackets only when the current genus is different to the original genus when the taxon was described)

English Common Name (centred, all words starting with a capital letter)

**AUTHOR(S)** (initials and surname, bold, centred)

Original text (left aligned)

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English common name (using Bill Branch's Field Guide to Snakes and Other Reptiles of Southern Africa, third edition, 1998, for reptiles; and Channing and Rödel's Field Guide to the frogs and other amphibians of Africa, 2019, for amphibians as far as possible).

The body of the note should include information describing the locality (country; province; quarter-degree locus; location; latitude and longitude in D° M' S" format; elevation above sea level), providing the date (day, month, year), naming the collector(s), and stating the place of deposition and museum accession number, or fate of the animal. The body should also include information on the size, colour and taxonomic characters (e.g., scalation, webbing) used to identify the specimen, as well as the distance to the nearest published locality.

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This is a popular style article showcasing the work and/or research of young, upcoming herpetologists across the African continent. Unlike any of the other submissions, this style should be written in the third person. It could feature work already published or ongoing work. Photographs to accompany the article are highly encouraged. These may include study specimens, study area, and/or researchers.

A general format should be followed:

Author name ([in full], centred, upper case)

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## ACKNOWLEDGEMENTS

Acknowledgements should be brief and should not list titles and institutions, but should include the first name and surname in full. Institutions should only be listed where individuals are cited as pers. comm. in the text. Authors must acknowledge collecting permits and animal care protocols together with which author they were granted. Any mention of authors should refer to them by initials only (e.g. GJA for Graham J. Alexander). It is recommended that authors acknowledge reviewers by name if they waive anonymity. This is not a requirement, but would be greatly appreciated.

## REFERENCES

Reference formatting is similar to *African Journal of Herpetology*. As of 2019, extensive changes have been made to simplify its appearance. However, as always, references should be listed in alphabetical order and should refer only to publications cited in the text. Abbreviate journal names in the References in the standard way. Standard abbreviations can be found at various web sites such as: www.bioscience.org/atlases/jourabbr/list.htm or home.ncifcrf.gov/research/bja/

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**African Herp Newsletter**: Bates MF, Nuttall R. 2013. Article: A case of death-feigning in the striped grass snake *Psammophylax tritaeniatus* (Gunther), with a review on the occurrence of this phenomenon in southern and eastern African snakes. African Herp News 60: 5–9.

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In text citations should be in chronological order: (Jacobs 1952, 1966; Edwards and Holmes 1965; Rosen et al. 1990). When a paper with more than two authors is cited, only the first appears in the text (Taylor et al. 1993). If a paper has more than ten authors, only the first five should appear in the references followed by et al. Cite unpublished data as e.g. Alexander (in press), which then appears in the list of references, or as G. J. Alexander (pers. comm.), in which case Graham J. Alexander's name and institutional affiliation should appear under Acknowledgements. Unpublished reports are cited as personal communications.

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Authors' full names and affiliations should be provided at the end of the submission, as follows:

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Tables should be in Arabic numerals, double spaced and on separate pages with a legend at the top. Lines should only be used to separate headings. Table formatting is most convenient when 'table commands' are used to separate columns. Do not use vertical lines. All tables must be mentioned in the text and numbered consecutively (Arabic numerals).

## FIGURES AND PHOTOGRAPHS

Figures must be restricted to the minimum needed to clarify the text. The same data should not be presented in both graph and table form. Photographs and figures should be provided at high resolution (minimum of 600 dpi for colour images). Lower resolutions are not acceptable. Files should be saved and submitted as one of the following file formats: TIFF (Tagged Image File Format; preferred), PostScript or EPS (Encapsulated PostScript). Please submit line art as a scalable vector diagram (EPS). Labelling in figures should be in lower case, except for the first letter of the first word. All figures must be mentioned in the text and numbered consecutively (Arabic numerals).

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