African Herp News

Newsletter of the
Herpetological Association of Africa

Number 51 AUGUST 2010

HERPETOLOGICAL ASSOCIATION OF AFRICA

http://www. wits.ac.za/haa

FOUNDED 1965

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NEWSLETTER EDITOR'S NOTE

Articles shall be considered for publication provided that they are original and have not been published elsewhere. Articles will 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.

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Louis du Preez, School of Environmental Science and Development, North-West University, Potchefstroom Campus, Private Bag X6001, Potchefstroom 2520, South Africa. Louis.duPreez@nwu.ac.za

COVER PHOTOGRAPH: *Nucras lalandii* from Nottingham Road, KwaZulu-Natal Province, South Africa. Photograph by: Bryan Maritz. Canon EOS 50D (1/200, F18, ISO 100).

ANNOUNCEMENTS

SECOND ANNOUNCEMENT

10th Conference of the Herpetological Association of Africa
11-14th January 2011
Cape Town, South Africa
Venue: University of Cape Town, Kramer Building

The 10th Conference of the Herpetological Association of Africa will take place at the University of Cape Town in Western Cape Province, South Africa, from Tues 11th to Friday 14th January 2011. This conference is being organized by staff from the South African National Biodiversity Institute and the HAA. The venue lies in the heart of Cape Town, just 10km from tourist attractions such as the V&A Waterfront and the South African Museum. Accommodation will be available at the university residences, or some suggested guest houses (within walking distance). All meals will be catered for at the venue, with an icebreaker at a local venue. The conference talks will begin on the morning of the 12th and run through the 14th. Delegates for the conference are expected to arrive by the evening of Tue 11th Jan for registration and icebreaker.

Three keynote speakers, of high international standing and representing a broad array of interests, have been invited to lead the conference (pending funding), Ted Townsend (San Diego State University), Bieke Vanhooydonck (University of Antwerp) and Maarten de Wit (University of Cape Town).

Any parties interested in holding workshops are welcome to contact the conference organizers.

Visit the conference website: https://sites.google.com/site/10haacapetown/

Organizing committee:
Krystal Tolley (k.tolley@sanbi.org.za), John Measey (john@measey.com), Jessica da Silva (jessica.m.dasilva@gmail.com), Keshni Gopal (k.gopal@sanbi.org.za), Rowena Stevens (r.stevens@sanbi.org.za)

Additional Announcement:
At this stage the conference fees have not been finalized but, as in previous HAA conferences, we will attempt to provide a low cost conference and to encourage student attendance (accommodation at UCT is very reasonably priced).

Please register your intent to attend, which will put you on the conference mailing list by filling out the online form the conference website https://sites.google.com/site/10haacapetown/ or the new HAA website http://www.africanherpetology.org/ for updates. A call for abstracts will be issued in September.

ARTICLES

VARIATION IN HEMIPENES OF DIFFERENT COLOUR PHASES OF *PSEUDASPIS CANA* (LINNEAUS) WARRANTS RE-EVALUATION OF THE SPECIES

JOHN VISSER

P.O. Box 3599, Vineta, Swakopmund, Namibia. E-mail:jdvisser@iafrica.com.

Hemipenal extrusion of a road-killed *Pseudaspis cana* (SMR1065/JV8632) of the smaller northern brown phase of this species from 5 km south of Omaruru (2115BD), Namibia with a total length of 1225 mm, disclosed hemipenes that were much shorter than those of the southern larger black phase of the Western and Northern Cape (South Africa). To exclude the possibility of congenital defect for this observed shortness, material (SMR9886, 11031, 10032 from Katima Mulilo; SMR7079, 5 km south of Windhoek; SMR9390 from between Kalkrand and Omaseb) from the National Museum of Namibia was probed (N = 6, with total lengths of 805 mm (truncated) – 1148 mm, mean 1041 mm) and confirmed the small size of the hemipenes in the brown phase (Fig. 1).

Fig. 1: The extruded hemipene of a northern brown-phase *Pseudaspis cana* from 5 km south of Omaruru, Namibia. (Photo: John Visser).

The much longer hemipenes of the black phase are illustrated in Brain (1959) and Broadley (1983). The hemipenes of the brown phase which I examined lacked whorls, having just a slight twist in their length whereas in the black phase there are eight or nine whorls. In the brown phase specimens that I examined the hemipenes extend to subcaudals 6 – 10 (mean = 8) and, as deduced from photographs by Brain (1959) and Broadley (1983), in the black phase to subcaudals 18 or 25. I suspected that the hemipenes shown in Broadley (1983) may have been slightly decomposed as the whorls show more separation than that seen in freshly killed or living specimens. This separation would account for the higher subcaudal scale count termination in that specimen. The lower subcaudal scale termination shown in the Brain (1959) photograph of the left hemipenis illustrates the tighter whorls as seen in the hemipenes of living snakes.

Laurent (1956) proposed that the average lower midbody and subcaudal scale counts justified subspecific recognition for the northern brown phase as *P .c. anchietae.* Broadley (1983) concluded that these variations from the nominate race were clinal. The magnitude of the above differences in hemipenal characters between the two colour phases show a deeper level of subspecific separation than that based on the earlier but limited and currently disputed significance of scale counts The re-instatement *P.* c. *anchietae* based on hemipenal differences may be called for. As the literature of the past four decades has not discriminated between the colour phases, a physical re-examination of the cited material is required to justify a final decision and is in progress.

Acknowledgments

D.G. Broadley most generously provided all his data sheets for Zimbabwean, Zambian, Malawian and Mozambiquean brown phase *Pseudaspis cana.* Mrs. Matilda Awawas of the National Museum of Namibia, Windhoek, kindly lent material for comparative purposes. Wulf Haacke for his kindness in obtaining and sending a pdf of C.K. Brain's 1959 paper to me.

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SIZE-CLASS DISTRIBUTIONS FOR FOUR LIZARD SPECIES FOUND IN SUIKERBOSRAND NATURE RESERVE, GAUTENG, SOUTH AFRICA

GAVIN P.R. MASTERSON[1,2], DANIEL KOEN[2], LIESL DU TOIT[2], & NATALIE HORN[2]

[1]School of Animal, Plant, and Environemtal Sciences, University of the Witwatersrand, P.O. Wits, 2050. gavinmasterson@gmail.com.
[2] Gauteng Department of Agriculture & Rural Development, Cnr. Market & Eloff Strts, Johannesburg, 2000.

INTRODUCTION & METHODS

Size-class distribution data for populations of lizard species in southern Africa are not readily available in the literature. While field guides e.g., Branch (1998) report the size ranges and maximum sizes of reproductively-active lizards that are housed in museum collections, museum collections do not constitute a representative sample of the sizes of individuals within any localised population.

Terrestrial trap arrays are non-discriminatory and capture individuals of multiple species and a wide range of sizes. We captured individuals of *Trachylepis capensis* (Scincidae), *Trachylepis varia* (Scincidae), *Gerrhosaurus flavigularis* (Gerrhosauridae) and *Nucras lalandii* (Lacertidae) using terrestrial trap arrays, comprising drift fences, pitfall traps and funnel traps, between 18 November 2009 and 26 March 2010. Trap arrays were situated in the recently-acquired, northern extension to Suikerbosrand Nature Reserve, Gauteng, South Africa (see Masterson et al. 2009). The extension to Suikerbosrand Nature Reserve comprises 6 936 ha of mixed agricultural lands, undisturbed grasslands and small rocky koppies (Masterson et al. 2009). We measured the snout-vent length (SVL) of captured lizards to the nearest 1 mm and toe-clipped them in order to identify recaptured individuals. Data for the size-class distributions of each species exclude all recaptured individuals. For the three larger species i.e., *Trachylepis capensis*, *G. flavigularis* and *N. lalandii*, we used a bin width of 10 mm, but for the smaller *T. varia*, we used a bin width of 5 mm.

RESULTS & DISCUSSION

Summary statistics for the four lizard species are shown in Table 1. We captured 205 individuals of *T. capensis*, 173 *G. flavigularis* individuals, 17 *T. varia* individuals and nine individuals of *N. lalandii* during the five months of trapping. The size class distributions for the four lizard species are shown in Figure 1. The most frequently occurring size class of *T. capensis* and *G. flavigularis* individuals in the extension of Suikerbosrand Nature Reserve is the size class between 70 - 80 mm SVL, 35 - 40 mm for *T. varia* and 90 - 100 mm for *N. lalandii.*

Trachylepis capensis is a widespread and abundant species in the extension of Suikerbosrand Nature Reserve (Masterson et al. 2009). Adult *T. capensis* are reported to range between 80 - 120 mm SVL (Branch 1998) with a maximum SVL of 135 mm (FitzSimons 1943). The mean SVL of the *T. capensis* individuals we captured was 72.3 ± 22.3 mm, with a maximum SVL of 128 mm and a minimum of 27 mm (Table 1). Thirty-two percent of the individuals we captured fell within the range of adult sizes reported by Branch (1998).

Table 1: Summary statistics for four size class distributions of four species of lizards

Species	**N**	**Median (mm)**	**Mean (mm)**	**SD (mm)**	**Max (mm)**	**Min (mm)**
Trachylepis capensis	205	71	72.3	22.3	128	27
Gerrhosaurus flavigularis	173	75	73.9	20	125	37
Trachylepis varia	17	37	36.9	4.3	47	29
Nucras lalandii	9	91	88.8	8.1	99	72

Gerrhosaurus flavigularis is also widespread and abundant in the extension to Suikerbosrand Nature Reserve but is reported to be more sensitive to agricultural land transformation than *T. capensis* (Masterson et al. 2009). Adult *G. flavigularis* is reported to range between 110 - 130 mm SVL (Branch 1998) with a maximum SVL of 140 - 150 mm (FitzSimons 1943) or 142 mm (Branch 1998). The mean size of the *G. flavigularis* individuals we captured was 73.9 ± 20 mm, with a maximum SVL of 125 mm and a minimum SVL of 37 mm (Table 1). Four percent of the individuals we captured fell within the range of adult sizes reported by Branch (1998).

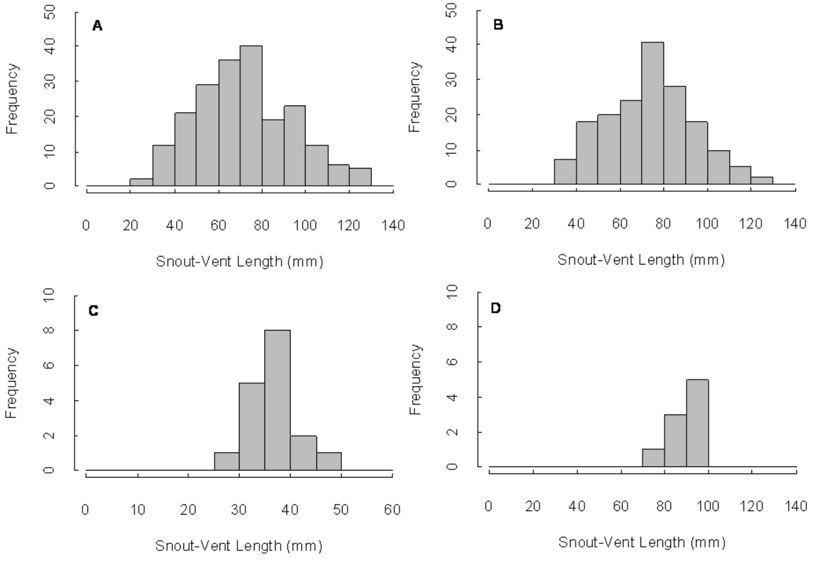

Fig. 1: Size-class distributions for four species of lizards in Suikerbosrand Nature Reserve, Gauteng, South Africa. A) *T. capensis*, B) *G. flavigularis*, C) *T. varia*, D) *N. lalandii.*

Trachylepis varia is less widespread and abundant in the extension of Suikerbosrand Nature Reserve than the two previous species, but is not as patchily distributed as *N. lalandii* (Masterson et al. 2009). Adult *T. varia* are reported to range between 50 - 60 mm (Branch 1998) with a maximum SVL of 65 mm in southern African specimens (FitzSimons 1943, Branch 1998). The mean SVL of the 17 *T. varia* individuals captured was 36.9 ± 4.3 mm, with a maximum SVL of 47 mm and a minimum SVL of 29 mm (Table 1). Zero percent of the individuals we captured fell within the range of adult sizes reported by Branch (1998).

Nucras lalandii is one of the least frequently detected species of lizard in the extension of Suikerbosrand Nature Reserve, and appears to be very sensitive to habitat modification associated with historical agricultural land use in the area (Masterson et al. 2009). The population of *N. lalandii* in southern Gauteng appears to be isolated from the main distribution of the species (Branch 1998) and seems to occur in small numbers in the patches of undisturbed grassland in the extension of Suikerbosrand Nature Reserve (Masterson et al. 2009). Adult *N. lalandii* are reported to range from 75 - 95 mm SVL with a maximum SVL of 110 mm (Branch 1998). The mean SVL of the *N. lalandii* we captured was 88.8 ± 8.1 mm, with a maximum SVL of 99 mm and a minimum SVL of 72 mm (Table 1). Eighty-nine percent of the individuals we captured fell within the range of adult sizes reported by Branch (1998).

Size-class distributions for the four species presented range from close to poor approximations of the normal distribution based on the number of individuals we captured. If we assume that the likelihood of capturing an individual in a trap is not affected by its size i.e., equal capture probabilities between size classes, and we assume that the frequency of capturing an individual of a particular size class is related to the proportional abundance of that size class in the population, we note with interest that the proportion of adults in the populations of the four species ranges from 0 - 89 %. Our data suggest that the size of adult individuals of *G. flavigularis* and *T. varia* may be smaller than the sizes currently reported in the literature and that the recruitment of *N. lalandii* may be limited. Alternatively, we may be incorrect in our assumption regarding the capture probabilities of the size classes of each species, particularly *N. lalandii*. Lastly we point out that we could not explicitly assess gonadal condition in the animals we captured as they had to be released according to the requirements of another study. We assert that reports of size class distributions for populations of reptile species in southern Africa are valuable for basic ecological purposes.

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NATURAL HISTORY NOTES

AMPHIBIA: ANURA

BREVICEPTIDAE

***Breviceps adspersus adspersus* Peters, 1882**
Bushveld Rain Frog

TRANSPARENT WINDOW

The presence of a translucent area (a window) on the ventrum of *Breviceps macrops* and *B. namaquensis* and four species of *Hyperolius (H. acuticeps, H. benguellensis, H. nasutus,* and *H. pusillus)* is unique amongst African frogs. Recently, a population of *Breviceps adspersus adspersus* from between Karibib (2115DD) and Omaruru (2115DB), Namibia, were also found to possess a window (Fig.1). In this population the area is continuous, clearly demarcated and less translucent than in *B. macrops* (Fig. 2). In total the patches in the Usakos/Omaruru *B.a. adspersus* are about 75% of the transparent area seen in *B. macrops* and translucent to the degree that some internal organs can be seen. As earlier references to a translucent area in *B. a. adspersus* cannot be traced from the literature, I assume that this intrapecific variation has escaped earlier notice in Namibia and other regions within the nominate form's wide distribution. Intraspecific variation in the presence or absence of a window, as reported here for *B. a. adspersus,* has not been reported for any of the other windowed species in Africa or for any species elsewhere, viz., *Boophis rappoides* and *B. luteus* in Madagascar, *Eleutherodactylus augusti* in New Mexico, *Centolene ilex, Hyalinobatrachium pellucidum, H. fleischmanni* and H. *pulveratum* in South America, *Rana archotaphus* in Indochina.

All three *Breviceps* spp. that posses a window occur in arid regions thus the relatively mesic habitats of the other windowed species does not correlate with that type of habitat. A possible hypothesis may be evolutionary pressure by the many demands of habitat-partitioning in the mesic species.

Morphologically the translucency of the skin over the window in the pelvic region does not imply that it is thinner than in frogs without a window as this apparent thinness may be an optical illusion due to the region being pigmentless (Channing 2001). Further valuable and highly interesting preliminary input to this note by Angelo Lambiris, as deduced from examination of the photograph of *B. macrops* in Fig. 1, has been made. He concluded that the skin does not seem to be obviously thinner than elsewhere, and that the network of fine blood vessels that one would expect to see at least in the areas of the lateral margins of the transparent window (based on cutaneous vascular patterns in other species) are not at all apparent. The ventral thigh muscles are clearly visible and normally coloured whereas the *m. rectus abdominis* is transparent.

Fig. 1: Translucent window in *Breviceps a. adspersus* from between Usakos and Omaruru (SMR1066/JV 9177).

Fig. 2: *Breviceps macrops* from Kleinzee, Northern Cape Province, South Africa.

This raises some fascinating questions about myoglobin and other muscle constituents. The assumed thinness of the skin is not just a matter of reduction or absence of pigment cells, but some kind of true translucency or transparency of skin, muscle and coelomic membrane - a condition that I am quite certain does not occur in any other African amphibians.

In conclusion, the intraspecific variation in the presence of a window in *Breviceps* spp. and for the properties and function of window in the other 15 species requires further elucidation.

Acknowledgments

I am most grateful to Dr. Angelo Lambiris who did much more than respond to my enquiries, both kindly and promptly, by thoroughly improving this note's content in many ways. He and Robert Hopkins of Bulawayo complimented my own first-hand experience in examining living *B.a.adspersus* at localities other than between Usakos - Omaruru. Dr P.C. Withers and Dr. G. Thompson responded to my request for reprints of their and co-authors' classic papers on water balance in desert-adapted amphibians which greatly enhanced my own understanding of the subject.

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Submitted by:

John VISSER, Box 3599, Vineta, Swakopmund, Namibia. E-mail: jdvisser@iafrica.com.

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REPTILIA: SQUAMATA: SERPENTES

ELAPIDAE

Naja nigricincta nigricincta Bogert, 1940
Western Barred Spitting Cobra

DIET

The Western Barred Spitting Cobra, or commonly known as the Zebra Snake (*Naja nigricincta nigricincta*), has a varied diet which includes reptiles, amphibians, fish, eggs, small mammals and even insects (Marais 1992, Branch 1998, Cunningham & Shilongo 2002, Alexander & Marais 2007). Although snakes form part of their diet (Hebbard 1990, Spawls & Branch 1995, Marais 2004, Alexander & Marais 2007) it is not well documented (Johan Marais *pers. comm.*).

On 1 May 2010, between 18h00 and 18h30 an adult *N. n. nigricincta* (800 - 900 mm total length) was observed preying on an adult Horned Adder (*Bitis caudalis*) (280 - 350 mm) just south of the Brandberg massif southwest of Uis (21°18’25” S; 14°34’51” E) in north central Namibia. The substrate was fine gravel and coarse sand with sparse herbaceous cover and the closest woody plant was approximately 10 - 15 m away, as were rocks and boulders. The cobra was agitated by our attention and regurgitated the adder whilst being photographed (Fig. 1). It then moved off to a rocky outcrop approximately 20 m away, but came back to the regurgitated adder after half an hour, after which it moved off again for cover after it sensed us. The next morning the Horned Adder was gone, but it could not be confirmed if it was eventually consumed by the cobra.

An unconfirmed sighting of *N. n. nigricincta* preying on a Puff Adder (*Bitis arietans*) by a SRT (Save the Rhino Trust) staff member during 2004 from the Brandberg West area was previously reported to the authors. As far as we could determine this is the first record of *N. n. nigricincta* observed preying on *Bitis caudalis* from Namibia.

Fig. 1: Zebra Snake (*Naja nigricinta nigricinta)* eating a Horned Adder (*Bitis caudalis)*, Brandberg, Namibia.

Acknowledgements
Our appreciation goes to Johan Marais for his views on the diet of Zebra snakes and encouraging us to publish this sighting.

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Submitted by:

Peter CUNNINGHAM, Environment & Wildlife Consulting Namibia, P. O. Box 90717, Windhoek, Namibia. E-mail: pckkwrc@yahoo.co.uk. & **Cornelis VAN DER WAAL,** Environment & Wildlife Consulting Namibia, P. O. Box 90717, Windhoek, Namibia.

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VIPERIDAE

Bitis gabonica Duméril, Bibron & Duméril, 1854
Gaboon Adder

WINTER BREEDING

The mating behavior and reproduction of Gaboon Adders (*Bitis gabonica*) is known primarily from John Akester's observations of captive individuals in Zimbabwe (Akester 1979a; 1979b; 1984). Gaboon Adder courtship in captivity is sometimes preceded by male combat, copulation is purportedly brief (5 minutes; Akester 1979b) and parturition occurs approximately one year later, suggesting bi- or even triennial breeding cycles (Akester 1979a; Luiselli et al. 1998). In Nigeria, Luiselli et al. (1998) found wild gravid females between May and July (early phase of the wet season) and observed male combat and copulation during January – March (peak of the dry season). Luiselli et al. (1998) and Angelici et al. (2000) therefore assumed clear seasonality of mating and pregnancy in equatorial Africa.

In subtropical South Africa, Bodbijl (1994) documented a March – May mating season, based on the presence of spermatozoa in male road casualties. Linn et al. (2006) suggested a promiscuous polygynous mating strategy for *B. gabonica*, with males undertaking long mate-searching movements for sedentary females. Subsequently, Warner (2009) found activity peaks for both sexes in autumn during a radiotelemetry study of the species, and concluded that female movement during this time is associated with pheromone trail deposition. A neonate captured in early June with fresh yolk scar on the dorsum implies parturition also occurs in South Africa during autumn (Warner 2009).

In this note, we report an extension of the previously recorded South African Gaboon Adder breeding season. A male and female kept for multiple years in large, separate, open-air enclosures at Kosi Bay in Zululand, northern KwaZulu-Natal were put together in the male enclosure on 1 July 2010. No interaction was observed between the sexes until 8 July 2010. The day of 7 July 2010 was cool and rainy, and the female was successfully fed two adult mice. A rainfall event of 96 mm was recorded on the evening of 7 July 2010. The following day was sunny and warm, but the entire lower half of the enclosure was flooded with 100 – 120 mm of water. Both Gaboon Adders were observed basking on the dry portion of the enclosure in the morning hours, separated by a distance of over 1 m. At 15:30 the two were observed mating, and copulation exceeded 1 hr. Air temperature was 20º C during mating but the enclosure substrate was undoubtedly cooler. After mating, both snakes moved into the flooded portion of the enclosure and curled up together. The male Gaboon Adder was observed systematically prodding the raised neck of the female with his head. The two snakes stayed curled up together for the night of 8 July 2010, and for the majority of the following day. By mid-afternoon on 9 July 2010, the Gaboon Adders relocated to the dry side of the enclosure and stayed in close proximity to each other (usually coiled up together) until they separated on 26 July 2010. Mating was observed a second time on 21 July 2010, and it is likely additional copulation occurred during the time the two snakes were together.

Our observation, albeit of captive individuals, demonstrates that Gaboon Adders are capable of copulation during winter. More research is needed to determine whether winter Gaboon Adder mating is opportunistic (proximate individuals will sometimes copulate) or induced by environmental, ecological and/or physiological conditions. The former may be more likely, as Warner (2009) recorded a marked cessation of movement and feeding by telemetred free ranging individuals during winter in Zululand. However, it would appear that the previously assumed strict mating season of March-May for Gaboon Adders in Zululand is in fact more labile. From 24 October – 2 November 2009, Warner (2009) observed a a telemetred male *B. gabonica* move a cumulative distance of 806 m, including a single movement of 405 m to the inside of a thicket where he was found with an adjacent female. This suggests that mating between wild Gaboon Adders may occur in autumn, winter and spring. Just as Alexander & Kruger (2009) have recently noted for Puff Adders (*Bitis arietans*), it is likely the breeding “season” for Gaboon Adders is somewhat variable from year-to-year, and between populations, dependent on extrinsic and intrinsic factors influencing individuals.

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Submitted by:
Kirsty J. KYLE, Kosi Bay, iSimangaliso Wetland Park, KwaZulu-Natal, South Africa; E-mail: rkyle@iafrica.com, & **Jonathan K. WARNER,** School of Biological and Conservation Sciences, University of KwaZulu-Natal, KwaZulu-Natal, South Africa; E-mail: jonathan.k.warner@gmail.com.

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VIPERIDAE

Bitis gabonica Duméril, Bibron & Duméril, 1854
Gaboon Adder

DIET

Gaboon Adders (*Bitis gabonica*) feed primarily on small to moderate-sized rodents and birds (Bodbijl 1994, Luiselli & Akani 2003) but are capable of ingesting small duiker (Warner, in press) and domestic cats and chickens (Warner 2009). Gaboon Adder predation on other snakes (ophiophagy) has not previously been recorded in the literature. We report here several cases of Gaboon Adder predation on Puff Adders (*Bitis arietans*).

Over a period of six months, an adult male Gaboon Adder (1.3 m total length) kept in a large open-air enclosure at Kosi Bay, KwaZulu-Natal, ingested three adult (600 – 700 mm total length) Puff Adders, all resident to the same enclosure for over a year. The final Puff Adder eaten by the Gaboon Adder was a female that gave birth to an unknown number of hatchlings in the first week of April, 2010. Within two weeks of parturition, she was killed and consumed by the Gaboon Adder. Although the feeding event was not directly observed, the noticeable bulge and distended scales of the Gaboon Adder indicated a recent meal. Escape or predation of the Puff Adder by another animal was unlikely, given the 1.5 m high concrete wall and gill-net roofing of the enclosure.

A second gravid Puff Adder (800 mm total length) was captured in an informal settlement on 4 March 2010 and placed with an adult male Gaboon Adder (1.1 m total length) in a nearby outdoor enclosure at the Crocodile Centre in St. Lucia Village, KwaZulu-Natal. The Gaboon Adder was resident in the enclosure for six years. Sometime during the evening of 5 March 2010 or early morning of 6 March 2010, the Puff Adder gave birth to 33 hatchlings. At approximately 10h00 on 6 March 2010, the Gaboon Adder was observed ingesting the Puff Adder. After eating the female, the Gaboon Adder slowly moved around the enclosure with head raised and tongue flicking, seemingly inspecting the hatchlings.

Both Gaboon Adders were in excellent condition and regularly fed rats. In addition to the postpartum Puff Adders, it is possible, but unverified, that one or both of the Gaboon Adders also preyed on some of the hatchlings.

Although our observations occurred in captivity under semi-natural conditions, this diet record is noteworthy due to its novelty, the species involved (Puff Adders and Gaboon Adders are morphologically similar and paraphyletic within *Bitis*) and the predation of the female Puff Adders after giving birth. Although coincidence should not be ruled out, the two feeding events involving gravid Puff Adders leads us to suspect that something subsequent but perhaps connected to the parturition process may have prompted the Gaboon Adders to feed, possibly involving pheromones or other chemosensory stimuli.

Gaboon and Puff Adders in South Africa are regionally sympatric at suitable forest/woodland and forest/grassland ecotones in Zululand, and in forest/farm mosaics such as the Dukuduku and Manguzi areas (Warner 2009). One case of hybridization between the species is known in South Africa (Broadley & Parkey 1976). These observations of ophiophagy suggest antagonistic interactions may also occasionally occur between Gaboon and Puff Adders.

Acknowledgements

We thank Stacy Farrell for capturing the Puff Adder at the informal settlement near St. Lucia and Mark Robinson for reporting the predation at the Crocodile Center.

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Submitted by:

Jonathan K. WARNER, School of Biological and Conservation Sciences, University of KwaZulu‑Natal, KwaZulu-Natal, South Africa; jonathan.k.warner@gmail.com &
Kirsty J. KYLE, Kosi Bay, iSimangaliso Wetland Park, KwaZulu-Natal, South Africa; rkyle@iafrica.com.

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REPTILIA: SQUAMATA: SAURIA

SCINCIDAE

Microacontias litoralis Broadley & Greer, 1969
Coastal Legless Lizard

MAXIMUM SIZE

In July 2001 a large female specimen of the orange morph of *Microacontias litoralis* was collected at McDougall's Bay in Port Nolloth, Northern Cape, South Africa (29° 17'11" S, 16° 53'03" E, 2916BD) in coastal sand covered by dry plant litter. The specimen [TM 85756, Ditsong National Museum of Natural History (formerly Transvaal Museum, NFI)], measured 126.1 mm snout-vent length (SVL) and 27.3 mm tail length (TL).

Branch (1998. Field Guide to the Snakes and Other Reptiles. Struik Publishers, Cape Town) gives a maximum SVL of 119 mm for the species, with a typical size range of 110 - 115 mm SVL. Broadley & Greer [1969. A Revision of the Genus *Acontias* Cuvier (Sauria: Scincidae). *Arnoldia* **4**: 1 - 29] also give a maximum SVL of 119 mm and tail length of 28 mm. When the total body length (SVL + TL) and SVL measurements are considered, this new specimen represents a 4.4% and 6% increase in maximum size, respectively.

Submitted by:

Lemmy MASHININI, Ditsong National Museum of Natural History. P. O. Box 413, Pretoria, 0001, South Africa. E-mail: lemmy@nfi.museum.

*****

SCINCIDAE

Trachylepis varia Peters, 1867
Variable Skink

REPRODUCTION

Trachylepis varia is widely distributed in Africa and occurs in Kenya, through Tanzania, Rwanda and Burundi, south to South Africa, west to the Democratic Republic of the Congo, north east to Somalia and Ethiopia (Spawls *et al.* 2002). It is viviparous in parts of its range and oviparous in other parts (Branch 1998). Details are not available as to the mode of reproduction for all populations although viviparity has been confirmed for the Mozambique population of *T. varia*, and oviparity occurs in northern South Africa (Branch *et al.* 2005). There are several reports of clutch/litter sizes for *T. varia* ranging from 2-12 (Branch, *op. cit.,* Spawls *et al., op. cit.,* Auerbach, 1987). The purpose of this note is to report a new maximum clutch size for *T. varia.*

One female *T. varia* from the herpetology collection of the Natural History Museum of Los Angeles County (LACM), Los Angeles, California (LACM 92580), SVL = 62 mm from Kasane, North-West District, Botswana, collected 8 November 1970, contained 13 oviductal eggs. No evidence of embryos was seen. A clutch size of 13 is a new maximum size record for *T. varia.*

Acknowledgements

I thank C. Thacker (Natural History Museum of Los Angeles County, Los Angeles, California) for permission to examine specimens.

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Submitted by:

Stephen R. GOLDBERG, Whittier College, Department of Biology, Whittier, California 90608 U.S.A., E-mail: sgoldberg@whittier.edu.

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GEKKONIDAE

Pachydactylus fasciatus Boulenger, 1888
Banded Thick-toed Gecko

REPRODUCTION

Pachydactylus fasciatus is endemic to northern Namibia and occurs in northern Damaraland and Kaokoveld (Branch 1998). Reproduction of this gecko has been documented by Barts (2002) over several years using captive animals as well as by Bauer & Branch (1991) under natural conditions. Both state clutch sizes of up to two eggs.

I kept a pair of captive born *P. fasciatus* together in a terrarium. After a cooling period temperatures were slowly increased to daytime temperatures of 26 - 31°C. Both animals were moved to a new terrarium at the beginning of January 2010 for cleaning of the former terrarium. The interior of the new terrarium, including the sand layer used as substrate, was new and had been placed in the terrarium shortly before the geckos were introduced. This fact excludes all possibilities of any eggs being present in the terrarium before the introduction of the animals.

On 9 February 2010, three hard-shelled eggs were found buried under a pile of sand and moved to an incubator. The eggs measured 9.3 x 11.1 mm, 9.4 x 11.8 mm and 9.4 x 11.8 mm. Sizes are in range with formerly published egg data, but above average size of 8.9 x 10.9 mm (Barts 2002). Incubation took place at temperatures of 30 - 31°C during daytime and 24 - 26°C at night. Juveniles hatched after 68, 70 and 71 days respectively.

The short period of four days between eclosion of the first and the last gecko indicates either a clutch size of three eggs or an extremely short oviposition interval. The eggs are believed to originate from one clutch, as the terrarium was checked for eggs on a daily basis by the author. Unusual clutch sizes of more than two eggs have already been observed in the family Gekkonidae, for example in *Uroplatus henkeli* (Svatek & van Duin 2002).

Acknowledgment
I thank Mirko Barts (Kleinmachnow, Germany) for the constant exchange of experiences on the genus *Pachydactylus*.

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Submitted by:
Christian SCHNEIDER, Fliederweg 6, 65527 Niedernhausen, Germany. E-mail: christian@pachydactylus.com.

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VARANIDAE

Varanus albigularis Daudin, 1802
Rock Monitor

DIET

On 1 April 2010 at 14h00 we observed what appeared to be a hatchling *Varanus albigularis* Daudin, 1802 (approximately 250 mm total length) feeding on a garden slug of approximately 60 mm total length in a Windhoek garden (Fig. 1). According to Jauch (2002) *V. albigularis* hatchlings have a total length of between 240 - 260 mm. The *V. albigularis* hatchling was struggling with the relatively large slug by bashing it against a mica rock, managing to swallow about 50% of the slug after 20 minutes of observation after which the lizard disappeared into the grass.

Fig. 1: *Varanus albigularis* hatchling eating a slug, Windoek, Namibia.

As a generalist feeder (Clauss & Clauss 2002) *V. albigularis* diet consists mainly of invertebrates (including land snails) or anything small enough to swallow ranging from small tortoises to snakes and even carrion (Branch 1998, Branch 2006, Alexander & Marais 2007).

Although this observation is not entirely unexpected it includes slugs to the long list of prey items for *V. albigularis*. What was interesting to note was the size of the slug (approximately 25 % of the total body length) that the hatchling *V. albigularis* was attempting to consume, albeit with difficulty, and probably a first lesson in prey selection.

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Submitted by:

Peter CUNNINGHAM & Janke CUNNINGHAM, Environment & Wildlife Consulting Namibia, P. O. Box 90717, Windhoek, Namibia. E-mail: pckkwrc@yahoo.co.uk.

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VARANIDAE

Varanus niloticus Linnaeus, 1758
Nile Monitor

FEEDING BEHAVIOUR

Nile monitors (*Varanus niloticus*) are the largest lizards in Africa (Alexander & Marais 2007), and are one of the most widespread. Nile monitors are known to occupy a wide variety of habitats (excluding desert environments) but are usually associated with permanent water bodies (Branch 1998, Alexander & Marais 2007). They can occur at fairly high densities in parts of Africa (as many as 40-60 per km^2 in northern Kenya, Ghana and around Lake Chad - Gore et al. 2003) and are heavily exploited for their meat, skin, organs or as live pets (Luiselli et al. 1999, Gore et al. 2003). Despite their large size, wide distribution, high abundance, and general exploitation, descriptions of their foraging strategies, intra-species relationships and cooperative behaviour have seldom extended beyond the generalized.

In mid-February 2008, two Nile monitors (*ca.* 1.2 m in total length) were observed from a distance of *ca.* 4 m between the hours of 08h30 and 09h10 foraging for fish in a shallow pool along the Sabie River in the Kruger National Park. One monitor was observed progressively moving across a shallow pool (maximum depth *ca.* 150 - 200 mm) of dimensions *ca.* 2 m x 3 m, using its body and tail to drive the trapped fish (most likely *Tilapia sp.*) into the shallow edges of the pool (Fig. 1). The trapped fish jumped over the body of the monitor to escape. The monitor snapped at fish as they jumped over its back and caught numerous fish in this manner. Fish (ca. 8-12cm in length) were swallowed immediately, seemingly whole. The second monitor remained on the edge of the pool, and at no time did it attempt to lunge or snap at fish either in the water or jumping out of the water although they were in easy reach. The lizards appeared to make use of both their visual sense and olfactory receptors (Jacobson's organ) through regular flicking of their forked tongues.

Fig. 1: Photograph of *Varanus niloticus* capturing fish in a shallow pool in the Kruger National Park.

Nile monitors generally forage for a wide range of prey items on or below the ground, in trees or in water (Branch 1998, Mayes 2006). They are considered generalist feeders that will scavenge and actively hunt prey (Arbuckle 2009). The most important prey items vary with habitat and season. They have been reported to revisit previous excavations and ambush nesting birds (Gore et al. 2003) and fish (Pienaar 1978). Nile monitors have also been observed cooperating in pairs to raid the nests of crocodiles (Gore et al. 2003, Mayes 2006) with one individual distracting the female crocodile from her nest while the other rushes in to steal her eggs. Our literature review revealed no other reference to *V. niloticus* herding fish in the manner that we witnessed.

Mayes (2006) reported on the Australian *V. mertensi* and described their diet and foraging strategies, and observed that this species was "rarely observed pursuing and capturing healthy fish within the aquatic environment" (Mayes 2006). However Hermes's (1981), as cited by Mayes (2006), makes reference to *V. mertensi* using their bodies and tails to herd fish in a manner similar to what we observed by *V. niloticus*. It is not surprising that an animal representing a genus so clearly "capable of adapting their foraging strategies to take advantage of the various ways in which potential prey present themselves" (Mayes 2006), has exhibited the behaviour described in this note. But as the only other reference to such foraging behaviour in the genus (*Varanus*) is for *V. mertensi* from Hermes (1981), we thought it prudent to report the same behaviour in *V. niloticus.*

We were also intrigued by the apparent interaction (cooperation) between the two monitors. Although there was opportunity for both monitors to take advantage of the trapped fish, the waiting monitor remained to the side of the pool smelling the air with its tongue. Was their interaction driven by the defence of an abundant resource? Was the observing monitor waiting for the first to have its fill and move away from the pond? Could this interaction be a form of "*proto-cooperation or automatic mutualism*" (as defined by Allee (1958)) rather than cooperation? Schaller & Crawshaw (1982) described similar proto-cooperation between Paraguayan Caiman (*Caiman crocodilus*) feeding at road culverts. It is especially difficult to surmise as very few intraspecific interactions have been recorded (Gore et al. 2003), but it poses interesting questions regarding feeding strategies and social behaviour.

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Submitted by:

Mark KEITH & Aimee E. GINSBURG, School of Animal, Plant and Environmental Sciences, University of Witwatersrand, P. Bag X3, WITS, Johannesburg, 2050, South Africa. E-mail: mark.keith@wits.ac.za.

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GEOGRAPHICAL DISTRIBUTIONS

AMPHIBIA: ANURA

MICROHYLIDAE

Phrynomantis affinis **Boulenger, 1901**
Spotted Rubber Frog

Namibia, Erongo Region, Brandberg, 2114BA, 16 July 1987, J.O. Wirminghaus, Angelo J. Lambiris collection, AJL2782.

The details of the *Phrynomantis affinis* tadpole illustrated in du Preez & Carruthers (2009, A Complete Guide to the Frogs of Southern Africa. Struik Nature, Cape Town, South Africa, Pp. 488) from the Brandberg extends the known distribution of this rare species by 275 km from Ombutjomatemba, Namibia (2017CA) in the north-east. This locality also extends the known range westward by 150 km for the species in Namibia as a whole from Oshigambo (1716CC), 19 km NNE of Odangwa and which is 375 km north of the Brandberg.

Acknowledgments
Louis du Preez answered queries on the source of the material for his and Carruthers' description of the Brandberg P. *affinis* tadpole. Angelo Lambiris sent details of the Brandberg *P. affinis* tadpole and a digital photograph of it which also served to verify his original identification. He generously gave permission to use his catalogued details for this note.

Submitted by:
John VISSER, P.O. Box 3599, Vineta, Swakopmund, Namibia. E-mail: jdvisser@iafrica.com.

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REPTILIA: CHELONIA

TESTUDINIDAE

Kinixys spekii **Gray,1863**
Speke's Hinged Tortoise

Namibia, 110 km north of Grootfontein, 1818DB, S 18° 54', E 18° 47', 6 March, 2010, J.D. Visser.

The distribution of *Kinixys spekii* in Namibia has been recorded as the northern districts of Okavango and the Caprivi districts, specifically the Mamili and Mudumu National Parks, the Mahango Game Reserve and the Caprivi and Popa Falls Game

Parks (Griffin 2003. Annotated checklist and provisional conservation status of Namibian reptiles. Namibia Scientific Society, Windhoek, Pp. 169). The same source mentions an unconfirmed record for Nkurenkuru (1718DA).

At 10:00 on 6 March 2010, a female *Kinixys spekii* crossed the B8 highway 110 km north of Grootfontein (S 18 54, E 18 47, 1818DB). in an area of forest savanna and woodland in the Omuramba catchment area. This record is 320 km from Popa Falls Game Park, the nearest confirmed locality (Griffin, op.cit.) and is 142 km from Nkurenkuru. Length to height ratio of the specimen was 2.4 (length = 150 mm, height of shell = 64 mm). Scalation details are as per Boycott & Bourquin (2000, The southern African Tortoise Book. O. Bourquin, P.O. Box 1083, Hilton, 3245, KwaZulu-Natal, South Africa, Pp. 228) viz., vertebrals = 5, costals = 4 pairs, and marginals = 1. As the specimen was not collected and Figure 1 serves as the voucher.

Fig. 1: Dorsal (top), and ventral (bottom) views of a Speke's Hinged Tortoise collected 110 km North of Grootfontein, Namibia.

Submitted by:
John VISSER, P.O. Box 3599, Vineta, Swakopmund, Namibia. E-mail: jdvisser@iafrica.com.

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TESTUDINIDAE

Psammobates oculifer Kuhl, 1820
Serrated Tortoise

Zimbabwe, Matabeleland North Province, Hwange District, Hwange National Park, sand ridge north of Ndodanna gate on the southern boundary of the National Park (Chemuumi vlei), S 19º16’, E 27º16’ (1927AD) approximately 1020 masl. Four specimens were seen by J.H. on 16 and 17 December 2008. On 21 May 2009 a dark juvenile was photographed and on 1 October 2009 a pale adult was photographed (Fig. 1 & 2). The species has only been seen on this one sand ridge.

These records are the first for Zimbabwe and represent a north-easterly range extension of approximately 150 km from the nearest Botswana locality near Nata (Boycott & Branch, 1989, *in* Swingland & Klemens (eds), *The Conservation Biology of Tortoises, Occ. Pap. IUCN Species Surv. Comm.* 5**:** 1-202).

This area in the south of the Hwange National Park is classified as Central Kalahari Tree/Shrub Savanna (Wild & Grandvaux Barbosa, 1968, *Flora Zambesiaca Supplement – Vegetation Map*), with *Acacia leuderitzii, A. erioloba, Lonchocarpus nelsii, Baikiaea plurijuga, Ochna pulchra, Terminalia sericea* and *Baphia massaiensis.* This vegetation type is replaced south of the Chemuumi vlei by savanna woodland, mainly *Colophospermum mopane*.

Fig. 1: Dorsal view of a Serrated Tortoise observed in Hwange National Park, Zimbabwe.

Fig. 2: Ventral view of a Serrated Tortoise observed in Hwange National Park, Zimbabwe.

Submitted by:

Donald G. BROADLEY, Natural History Museum of Zimbabwe, P.O. Box 240, Bulawayo, Zimbabwe. E-mail: broadley@gatorzw.com, **Jane HUNT** & **Gary CANTLE,** Lion Research, c/o Main Camp, Hwange National Park, Zimbabwe. E-mail: dindinde@mweb.co.zw & gary.cantle@qmail.com.

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REPTILIA: SQUAMATA

ELAPIDAE

Dendroaspis poylepis polylepis Günther 1864
Black Mamba

Angola, Luanda Pil, approximately 6.5 km west of Soyo airport, S 06° 09' 20", E 12° 15' 58". Adult male killed by vehicle and photographed (Fig. 1).

The bio-diversity of Angola as a whole has been poorly documented and the distribution and diversity of the country's snakes is no exception. According to Spawls & Branch (1995), *D. polylepis* occurs throughout much of the eastern half of Angola, but has not been recorded in the north-western portion of the country. The following record of *D. polylepis* from north-western Angola therefore appears to represent a considerable range extension to the known distribution of this species.

On the 25th of June 2010 I collected an adult male specimen that had been caught up in the wheel hub of a "Terex" crane. The snake was attempting to cross the road as the crane drove past. The location of the record was in an area known locally as Luanda

Pil (S 06° 09’ 20”, E 12° 15’ 58”) which is approximately 6.5km west of Soyo airport (S 06° 08’ 23”, E 12° 22’ 18”). The habitat in the vacinity of the record is made up of grasslands with scattered trees and patches of dense bush. The shore line in the immediate area of Luanda Pil is bordered by a narrow strip of mangrove.

Fig. 1: *Dendroaspis polylepis polylepis* from Luanda Pil, Angola

The town of Soyo falls within a transition zone between Angolan scarp savanna and woodland (Olsen et al. 2001) and central African mangroves. This ecoregion is comprised of several ecological zones with palm savanna and grasslands (CSIR, 2005) being the dominant habitats on the fringes of the Congo River estuary system. The combination of open palm savanna interspersed with isolated patches of thickets and forests should provide ideal habitat to sustain a large elapid such as *D. polylepis.* Spawls & Branch (1995) state that this species is most common in well- wooded savanna at low altitude.

I was able to source reference to four other locality records for *D. Polylepis* in Angola. J.V.B. du Bocage (1895) recorded two large specimens of *Dendroaspis angusticeps* [= *D. polylepis*] from Quindumbo and Cahata. Sara Manacas (1982) listed four localities for *D. polylepis* in Angola, namely Cahata, Hanha, Quindumbo and Quissange. As far as I am able to ascertain the four mentioned localities are in Benguela and Huambo provinces of south western Angola, an area approximately 675km south of the Luanda Pil record.

The specimen measured 1680 mm + 515 mm. Basic scale counts were as follows: 13 lower labials and 9 upper labials with the 4th entering the eye. 3 pre-oculars, 4 postoculars, anal shield undivided, subcaudals paired. Temporals were 2 + 4 (right side) and 2 + 3 (left side). I was unable to obtain an accurate ventral, subcaudal or midbody row count due to the severity of the snake’s wounds suffered as a result of being caught in the wheel hub. The specimen was photographed and frozen to be later preserved in formalin.

Acknowledgements
I thank D.G. Broadley for providing references for *D.polylepis* locality records in Angola and Nicole Mann, Angola LNG wildlife technician, for her assistance in collecting data from the specimen in question.

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Submitted by:
Tim BAYNHAM, Angola LNG Project, Kwanda base, Soyo, Angola, E-mail: nyamireptile@yahoo.co.uk.

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ELAPIDAE

Dendroaspis polylepis polylepis Günther, 1864
Black Mamba

Farm Welgevonden (Plot 37), Gauteng, South Africa, S 25° 22' 24"; E 28° 24' 18". Collected on the 14 March 2010 by Mr A Vosges. Deposited in the collection of the Transvaal Museum (TM 85808).

Dendroaspis polylepis polylepis is a large venomous elapid snake that occurs throughout large parts of East and Central Africa, southwards to the savannas of South Africa (Branch 1998). In South Africa, *D. p. polylepis* is known from Limpopo, Mpumalanga, North-West, and KwaZulu-Natal provinces. Jacobsen (1995) recorded the species just outside of Gauteng in a QDS that crosses the provincial border (2528BC). However *D. p. polylepis* has never been formally recorded within Gauteng Province itself

(Whittington-Jones et al. 2008).

On 14 March 2010 an adult male Black Mamba was killed by Mr A Vosges on the farm Welgevonden, approximately 5 km within the Gauteng Provincial border. The snake measured 1810 mm + 470 mm in length, and did not have any food in its gut. This specimen thus represents a new provincial record for Gauteng.

Anecdotal evidence suggests that some tropical species of snakes have recently extended their ranges southwards further into northern Gauteng (e.g., *Python natalensis* and *Naja annulifera*). We speculate that this may also be the case with *D. p. polylepis*, although several anecdotal reports of the species suggest that it has been previously observed in the area.

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Submitted by:

Bryan MARITZ, School of Animal, Plant & Environmental Sciences, University of the Witwatersrand, P.O. Wits, 2050, South Africa, E-mail: bryanmaritz@gmail.com, & **Graham J. ALEXANDER**, School of Animal, Plant & Environmental Sciences, University of the Witwatersrand, P.O. Wits, 2050, E-mail: graham.alexander@wits.ac.za.

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SCINCIDAE

Acontias namaquensis Hewitt, 1938
Namaqua Legless Skink

On 8 October 2009 at 14h00 an adult Namaqua Giant Legless Skink was found on the main road (N7) 16.9 km south of Garies, Northern Cape Province (3018CA; 30°40’58” S, 18°03’34” E, Elevation 340 m asl). The day was cloudy and rain had fallen in the region during the early morning. The specimen was in distress, either from overheating on the tar surface or due to buffeting by passing vehicles, but recovered soon after capture. After being photographed, the specimen was euthanized for tissue collection. It was accessioned into the Port Elizabeth Museum herpetological collection (PEM R18207).

An additional juvenile specimen (PEM R18218), collected in coastal sand dunes on the farm Noup, Northern Cape Province (3017CA; 30°07’13” S, 17°12’12” E) by Bryan

Maritz in October 2009, documents the southern record in the coastal region.

Broadley & Greer (1969) recorded the species as far south Port Nolloth in the coastal region, and inland as far as Kamiesberg (the latter based on a paratype in the Albany Museum (AM unnumbered; now PEM R4826). The Noup record extends the coastal population approximately 100km south of Port Nolloth, whilst the Garies record extends the inland distribution south of the Kamiesberg by about 35km.

This form was originally described as a western race of *Acontias plumbeus* (Hewitt 1938) and later as an isolated race of *A. gracilicauda* (Broadley & Greer 1969). Numerous examples of cryptic taxa within *Acontias* have been demonstrated using genetic analysis (Daniels et al. 2009). Given the large disjunction in distribution between *A. g. namaquensis* and the typical race in the east we suggest that *A. namaquensis* is best treated as a full species.

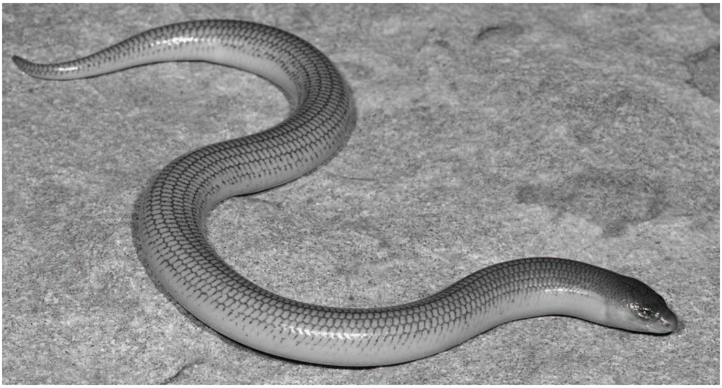

Fig. 1: *Acontias namaquensis*, 16.9 km south of Garies, Northern Cape Province, South Africa. (Photograph: W.R. Branch).

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Submitted by:

William R. BRANCH, Department of Herpetology, Bayworld (Port Elizabeth Museum), P.O. Box 13147, Humewood 6013, South Africa, & **Bryan MARITZ**, School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Johannesburg, South Africa, P.O. Wits, 2050, E-mail: bryanmaritz@gmail.com.

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AFRICAN AMPHIBIAN WORKING GROUP 14
2-4 JUNE 2010
MONKEY VALLEY RESORT, NOORDHOEK, CAPE TOWN

ABSTRACTS

THE HAIRY FROG, A CURLY FIGHTER? – A NOVEL HYPOTHESIS ON THE FUNCTION OF HAIRS AND CLAW-LIKE TERMINAL PHALANGES, INCLUDING THEIR BIOLOGICAL AND SYSTEMATIC SIGNIFICANCE

BAREJ, Michael F.[1,2], **Wolfgang BÖHME** [2], **Steven F. PERRY** [3], **Philipp WAGNER** [2], **& Andreas SCHMITZ**[4]

[1] *Museum für Naturkunde, Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin, Invalidenstrasse 43, D-10115 Berlin, Germany*
[2] *Zoologisches Forschungsmuseum Alexander Koenig, Adenauer Allee 160, D-53113 Bonn, Germany.*
[3] *Institut für Zoologie der Universität Bonn, Poppelsdorfer Schloss, D-53115 Bonn, Germany.*
[4] *Muséum d'histoire naturelle, Department of Herpetology and Ichthyology, C.P. 6434, CH-1211 Geneva 6, Switzerland.*

The Central African Hairy Frog *Trichobatrachus robustus* Boulenger, 1900 possesses two morphological peculiarities, its unique hair-like dermal appendages, and claw-like terminal phalanges also known from related genera. We present published hypotheses on the function of the "hairs" and provide new data on their structure. Moreover, we review formerly published data on claw-like terminal phalanges in African amphibians and discuss their systematic significance, pointing out that recent phylogenies do not support close relationships of genera with this unique structure. Finally we present a novel hypothesis on the use of claws and "hairs".

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CONFIGURING THE DAINTY FROGS (*CACOSTERNUM*)

BURGER, Marius[1], **Alan CHANNING**[1], **& Andreas SCHMITZ**[2]

[1] *Department of Biodiversity & Conservation Biology, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa*
[2] *Department of Herpetology and Ichthyology, Muséum d'histoire naturelle, C.P. 6434, CH-1211 Geneva 6, Switzerland*

The taxonomy of the genus *Cacosternum* Boulenger 1887 remains unsettled due to the

continued discoveries of morphologically cryptic species within this genus. Three new species were described in the past decade, but several more await formal recognition. With the analyses of acoustic, morphological and genetic differences, we present a provisional review of the dainty frogs. Included in this revision is the description of two new species from KwaZulu-Natal, South Africa.

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SPECIES BOUNDARIES IN THE *HYPEROLIUS NASUTUS* COMPLEX (ANURA: HYPEROLIIDAE): MOLECULAR EVIDENCE

CHANNING, Alan[1], **Annika HILLERS**[2], **Stefan LÖTTERS**[3], **Mark-Oliver RÖDEL**[2], **Susan SCHICK**[3], **& Mercurio VINCENZO**[4]

[1]Biodiversity and Conservation Biology Department, University of the Western Cape, Private Bag X17, Bellville, 7535, South Africa.
[2]Museum für Naturkunde Berlin, Herpetology, Invalidenstr. 43, 10115 Berlin, Germany
[3]University of Trier, Biogeography, Am Wissenschaftspark 25-27, 54295 Trier, Germany
[4]Gneisenaustrasse 57, 10961 Berlin, Germany

The widespread long-nosed reedfrog complex, generally referred to as *Hyperolius nasutus*, was shown in 2002 to consist of at least three populations with different advertisement calls. Further work since 2002 has shown that the situation is more complex. The present consensus recognises seven species in this complex, based on small morphological differences and the experience of the investigators. We ask if molecular evidence will support the status quo. We sequenced 64 individuals, which were collected from 16 countries for 12S and 16S mtDNA, Direct optimisation was used to produce a consensus phylogeny. This produced six clades, each representing a species. The species differed from each other by 6 to 18% of the 16S sequence. The six species now recognised do not fully support the status quo.

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USING VIE MARKING AS A MONITORING TECHNIQUE FOR THREATENED GHOST FROG SPECIES

CONRADIE, Werner

Port Elizabeth Museum (Bayworld), P.O .Box 13147, Humewood, Port Elizabeth, 6013, South Africa

Ghost frogs belong to the family Heleophrynidae which are endemic to southern Africa. Ghost frogs diverged from all other amphibians over 160 million years ago, and are thus evolutionarily distinct from any other modern amphibian species. Only six species are found in southern Africa, of which two are critically endangered: Hewitt's ghost frog

(*Heleophryne hewitti*) and Rose's ghost frog (*Heleophryne rosei*). *Heleophryne hewitti* specifically is threatened by habitat degradation and loss of suitable habitats as a result of commercial afforestation and are restricted to only four streams in the Elandsberg Mountain range. Adults are secretive and notoriously difficult to find, while tadpoles are present all year round in fast-flowing perennial mountain streams. These tadpoles have an extended larval stage of over a year. The ease of finding the tadpoles of the species proved to be the ideal model to study the species in more detail. The movement of these tadpoles, population structure, as well as their individual growth must be studied and monitored. Visible Implant Elastomers (V.I.E.) markers were used to determine if the established method can be used as a new improved monitoring technique. One transect of 30 m was chosen and tadpoles are collected bi-monthly. Tadpoles are sedated in a weak MS 222 solution and marked with a specific colour code, then revived and released. Tadpoles showed no negative reactions when exposed to this technique and a 3-12% recapture rate was obtained so far. Does this technique have good potential in South African amphibian monitoring?

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DISTRIBUTION AND HABITAT PREFERENCES OF THE PAINTED REED FROG *HYPEROLIUS MARMORATUS* RAPP IN ITS NOVEL RANGE IN THE WESTERN CAPE PROVINCE OF SOUTH AFRICA

DAVIES, Sarah J., Melodie A. MCGEOCH & Susana CLUSELLA-TRULLAS

Centre for Invasion Biology, Department of Botany and Zoology, Stellenbosch University, P. Bag X1, Matieland 7602, South Africa

The characteristics of the novel environment are an important determinant of the success of range expansion in biological invasion. We measured the extent of occurrence and rate of invasion of the painted reed frog (*Hyperolius marmoratus*) in artificial water bodies in the Western Cape Province and modeled the habitat characteristics associated with water body occupancy. Occupancy records from twelve breeding seasons (1997/8 to 2008/9) showed that range expansion was most rapid during the second half of the period. Occupied dams spanned the Western Cape from its eastern boundary to the Cape Peninsula in the west, describing a range of 2869 km^2 and 4.6 degrees of longitude. Discontinuities in the extent of occurrence confirmed the importance of long distance jump dispersal suspected from a previous study in the invaded range. Positive spatial autocorrelation in occupancy up to a distance of c. 85 km suggested that dispersal was effective over relatively large distances. Climatic conditions and the availability of roosting sites adjacent to dams were important determinants of the presence of this species, while landscape characteristics assumed less importance. This species provides an informative case study of the rate and extent of potential future invasions by amphibians in this region, although further investigation of the mechanisms of the invasion is required.

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THE GIANT BULLFROG (*PYXICEPHALUS ADSPERSUS*) META-POPULATION IN GAUTENG, SOUTH AFRICA: CAN IT BE SAVED? (POSTER)

Ed Stam , Chris de Beer, & Abeda Dawood

National Zoological Gardens, Pretoria, South Africa

The presentation will focus on the Biodiversity Reserve launched in 2009 at the Total site on the N14 close to Lanseria and will share some insight on conservation projects the National Zoological Gardens will undertake at the site. Aims of the NZG giant bullfrog *in situ* conservation project include: to monitor long term population trends at the Total site, to monitor the movement patterns of translocated individuals, to investigate whether newly introduced individuals can establish themselves in a receiving population, to investigate the effect of life stage at translocation on survival.

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DIET OF THE COMMON LEAF LITTER FROG IN KIHANSI GORGE

(POSTER)

De Rezende, Tatiana

Biodiversity and Conservation Biology Department, University of the Western Cape

Little is known of the ecology of forest-floor dwelling vertebrates such as the common leaf litter frog, *Arthroleptis xenodactylus*. An incidental collection of these small frogs has been made in Kihansi Gorge. The study will closely examine morphological differences between male and female frogs, and determine the diet of these animals by a study of the gut contents. This will involve careful dissection under a microscope, and accurate sample handling, labelling and identification. Gut contents will be identified mostly by reference to entomology texts. All work will be documented by the preparation of permanent slides and photographs. A sufficiently large sample will be studied to ensure that the results are statistically significant.

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MONITORING THE THREATENED TABLE MOUNTAIN GHOST FROG (POSTER)

De Villiers, Atherton & M.E. de Villiers

Scientific Services, Western Cape Nature Conservation Board (CapeNature), Private Bag X5014, Stellenbosch 7599, South Africa

This critically endangered species (*Heleophryne rosei*) is endemic to an area of less than 10 km² of Table Mountain (Cape Town, South Africa). It is dependent on perennially flowing mountain streams in which to breed as ghost frog tadpoles take more than a year to complete metamorphosis. Although this species is threatened by habitat degradation and loss, all of its habitat is situated within a protected natural environment. The frogs of this species are difficult to monitor as they are highly cryptic and at least 70% of their habitat includes steep, rugged, inaccessible terrain. Monitoring is, therefore, focused on their distinctive tadpoles and habitat threats. This commenced in 1997 and is done annually during late summer when stream levels are at their lowest, making it easier to observe and count the tadpoles more accurately. Tadpole abundance graphs are presented for the two best known streams from which the most data have been recorded, Skeleton Gorge and Window Gorge (1997-2010). The erratic abundance patterns in the graphs can partly be attributed to inconsistencies with data collection data during an initial trial period. Data have been collected more consistently since 2005, and the further refinement of monitoring methods is being assessed. Habitat threats monitored include invasive alien vegetation, erosion and water abstraction activities. The management of these threats is addressed by the management authorities concerned on the basis of an annual report on this species.

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THE GULF OF GUINEA IDS: A WINDOW INTO AFRICA'S PAST

DREWES, Robert

California Academy of Sciences

A series of six California Academy of Sciences multidisciplinary expeditions have focused on the oceanic islands of São Tomé and Príncipe since 2001. Results of a number of recent molecular studies based upon fresh material of the unique amphibians and some of the endemic reptiles of these two islands suggest a closer relationship with East African taxa than with nearby western mainland species. This pattern of disjunction is reiterated in numerous traditional studies of plants, mollusks and other groups; some of these data predate the current sociopolitical difficulties in sampling in the Congo Basin. These distribution patterns may be explained by one of at least two hypotheses: 1. Intermediate taxa are currently present in the Congo Basin and simply haven’t been sampled; 2. The Gulf of Guinea island and East African components of these distributions are peripheral remnants of a once continuous Afrotropical belt of fauna and flora that was disrupted by geomorphogical changes on the mainland since the Oligocene . The possibility that both hypotheses have merit will be discussed.

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HABITAT USE AND POPULATION STRUCTURE OF THE WESTERN LEOPARD TOAD (*AMIETOPHRYNUS PANTHERINUS*) IN AN AGRICULTURAL SETTING

DUCETTE-RIISE, Stephen

South African National Biodiversity Institute, Cape Town, South Africa

Habitat alteration, primarily associated with human expansion and consumption, has been identified as the leading threat to worldwide biodiversity. Although many organisms are experiencing deleterious effects, amphibians appear to be suffering more than other vertebrate groups. Once species that has experienced impact through habitat alteration and urbanization is the Western Leopard Toad (*Amietophrynus pantherinus*: Bufonidae). In the western area of its disjunct distribution of the Southwestern Cape, the population is large and genetically diverse with a plethora of breeding sites. However, extinctions in the eastern area as well as a low number of breeding sites (only currently 7 identified) have sparked concern over conservation of this management unit. Previous studies have indicated that in urban settings in the western distribution, toads use gardens as foraging areas and terrestrial refuges during non-breeding portions of the year. Urban areas also have short distances between breeding sites allowing toads to disperse, and forming a stable metapopulation. In rural areas, the habitat is a more agricultural with greater distances between breeding sites (up to 15 km). Is the Western Leopard Toad capable of gene flow between distant breeding sites in rural areas? What habitat type do Western Leopard Toads use as terrestrial refuges and dispersal corridors in rural areas? In order to answer these questions, radio-telemetry and genetic analysis, by use of microsatellite loci, practices will be used. Here we present preliminary data on microsatellite loci and detail plans for radio-tracking during the 2010 breeding season.

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MIND THE GAP: INVESTIGATING THE CAUSE OF THE CURRENT RANGE DISJUNCTION IN THE CAPE PLATANNA (*XENOPUS GILLI*)

FOGELL, Deborah

South African National Biodiversity Institute, Cape Town, South Africa

The endangered Cape Platanna, *Xenopus gilli*, is a lowland and coastal species endemic to the Cape Floristic Region. The acid blackwater pools to which it is adapted are usually nutrient poor and contain high concentrations of humic compounds found within the fynbos vegetation indigenous to this area. Due to their very specific niche, human impacts such as agricultural and residential developments have reduced their distribution to a small number of localities. The current range of *X. gilli* is limited to three areas: the tip of the Cape Peninsula as well as Betty's Bay to Pearly Beach and on the Agulhas Plain. In other species with a similar disjunct distribution, such as the endangered western leopard toad, *Amietophrynus pantherinus*, substantial genetic divergence has occurred between populations. This study uses analyses of mitochondrial sequences to determine whether the gap in the distribution of *X. gilli* has resulted in a similar divergence, and when this disjunction occurred. Here we present results from SAMOVA and coalescent analysis to test the theories on the origin of the disjunction which we hypothesise could be due to (1) fragmentation due to sea level changes since the Pliocene, (2) recent warming and drying events circa 5000 years ago or (3) recent anthropogenic disturbances. The identification of separate *Xenopus gilli* lineages is essential in the formation of conservation strategies as they may merit separate management units. Threats such as building developments and potential hybridization due to the expansion in range of the Common Platanna, *Xenopus laevis*, are ongoing and put this red list species at risk of future extinction.

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CAPE RAIN FROGS IN AN URBAN SETTING: FACTORS IN CONSERVATION MANAGEMENT

HARRISON, James

JAH Environmental Consultancy, Cape Town, South Africa

The University of Cape Town recognizes the presence of a threatened species on its property, namely the Red Listed Cape Rain Frog *Breviceps gibbosus* (Vulnerable). The University commissioned a survey to describe the distribution and status of the species on its Middle and Lower campuses. The study showed that spatial distribution of the frogs was correlated with (a) spatial and temporal patterns of development, (b) physical features in the built environment, and (c) layout and management of gardens. These findings were used to make recommendations on how to protect the population and promote its spread into new habitats on the campuses.

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THREATENED FROGS IN KWAZULU-NATAL, SOUTH AFRICA: RECENT FINDINGS AND CONTRIBUTIONS TO THEIR CONSERVATION

HARVEY, James

Pietermaritzburg, South Africa

The KwaZulu-Natal province in eastern South Africa supports a high species richness of anurans (ca 72 species). Of these, six species are classified as Threatened (Critically Endangered, Endangered or Vulnerable), and another species currently listed as Data Deficient is likely to be upgraded to Threatened. Together with the south-western Cape, KwaZulu-Natal is one of two hotspots for threatened frogs in South Africa. The majority of these species are historically known from very few locations, poorly known and inadequately protected. The author has collected additional information regarding species distributions, population sizes, new populations and threats for several of the threatened species in the province and has contributed to improving their conservation status. This presentation provides an overview of the contributions the author has made recently to our knowledge of these species and their conservation.

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REPRODUCTIVE PLASTICITY IN A SAVANNA FROG - THE KEY TO COPING WITH UNPREDICTABLE CONDITIONS?

HIRSCHFELD, Mareike & Mark-Oliver RÖDEL

Museum für Naturkunde; Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin; Invalidenstr. 43; 10115 Berlin; Germany

West African savannas are habitats with unpredictable rainfall. Only species with plastic life history traits may survive successfully in these environments. In the microhylid frog *Phrynomantis microps* precipitation was important to trigger reproduction. However, the amount of rainfall needed for reproduction, differed in relation to rainy season length and total annual rainfall. Especially in years and/or regions with a short rainy season a threshold of minimum precipitation was needed to initiate spawning, reflecting a trade-off between the need to reproduce and the survival probabilities of offspring in ponds with a high desiccation risk. Trade-offs between reproduction and the risk of losing off-spring due to desiccation and/or predation was also reflected in a wide range of clutch sizes. This revealed an unexpectedly large frame of potential reproduction strategies in *P. microps* which probably is the key for this species to survive in a highly unpredictable environment.

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POPULATION DIVERGENCES IN MONTANE AMPHIBIANS THROUGHOUT THE EASTERN ARC MOUNTAIN RANGE; INVESTIGATING THE EFFECTS OF GAPS, GEOLOGIC FEATURES AND CLIMATE

LAWSON, Lucinda

University of Chicago, USA

Species with similar geographic distribution patterns are often assumed to have a shared biogeographic history, an assumption that can be tested with a combination of molecular, spatial, and environmental data. This study investigates three lineages of *Hyperolius* frogs with concordant ranges within the Eastern Afromontane Biodiversity Hotspot to determine whether allopatric populations of codistributed lineages shared a parallel response to historical events. The roles of refugial distributions, isolation, and climate cycles in shaping their histories are examined through Hierarchical Approximate Bayesian Computation, comparative phylogeography, and comparisons of current and past ecological niche models. Results from these analyses show that these three lineages have independent evolutionary histories, which spatially restricted available habitat (montane wetlands) has shaped into convergent geographic ranges. In spite of independent phylogeographic histories, diversification events are temporally concentrated, implying a degree of community response to vicariance events. This mixture of apparently disparate histories is likely due to different responses to climate cycle shifts promoting expansion or retreat during climate fluctuations. The combination of climatic modeling and phylogeographic data provides insight into potential unrecognized complexity in the evolution of codistributed taxa, yielding more information than any method alone.

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BAD INVENTORIES AND POOR TAXONOMY: 'THE' PROBLEM WHEN DEVELOPING CONSERVATION STRATEGIES FOR AFROTROPICAL AMPHIBIANS

LÖTTERS, Stephan[1], **D. RÖDDER**[1], **& J. KIELGAST**[2]
[1]*Department of Biogeography, Trier University, Am Wissenschaftspark 25-27, 54296 Trier, Germany*
[2]*Department of Biology, Section for Microbiology and Evolution, Copenhagen University, Universitetsparken 15, 2100 Copenhagen, Denmark*

Amphibians are worldwide declining at alarming rates with one third of the more than 6,600 species 'threatened with extinction' when IUCN Red List criteria are applied. As anchored in the IUCN Amphibian Conservation Action Plan, multi-dimensional conservation strategies need to be developed to prevent biodiversity loss at the large scale. Problems when developing conservation measures are different all over the world. We here show, using the Congo basin tree frogs (genus *Hyperolius*) as an example, that in tropical Africa major problems include limited species inventories combined with slow progress in systematics. In total less than 30 local species lists are available from the region, suggesting a range of 10 to 95 spp. suggesting that several of the relatively few inventories are bad. Comprehensive local surveys may reveal high numbers of species, e.g. eight syntopic *Hyperolius* species at Salonga NP (DRC). Their identification is hampered by poor original descriptions, lack of biological data, so that an integrative taxonomic approach is largely hampered. In addition, the likely existence of paraphyletic species has recently been discovered, suggesting that species identification is even more complicated.

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HOW CAN THE PAST HELP US WITH PLANNING THE FUTURE OF FYNBOS FROGS?

MEASEY, John

South African National Biodiversity Institute, Cape Town, South Africa

Most red list amphibians are threatened by habitat change, but their future contains many uncertainties including a changing climate. However, changes in climate since the last glacial maximum (LGM) are also likely to have had profound effects on the distribution of many species. The south-western Cape contains many lowland species, some of which are range restricted and threatened by habitat loss, alien invasive plants and fish, as well as urbanisation. Can information about their past help to predict future pressures of a predicted drying climate? In this study, three species are investigated using a combination of genetics and modelling to unravel their recent past back to the LGM. In the light of retrospective predictions, suggestions for future conservation scenarios are mapped out.

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FOAM NESTS IN *BREVICEPS*

MINTER, Les

PO Box 200, Barrydale 6750, South Africa

Egg masses of the terrestrial, direct developers, *Breviceps adspersus* and *B. sylvestris* were obtained from nests constructed by captive pairs and from nests found in situ in the field. Most of the tadpoles reared individually in petri dishes, developed to metamorphosis, whereas attempts to rear intact egg masses were less successful. Nest location and structure is described and the possible functions of the foam they contain, is discussed.

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(UN)SUSTAINABLE USE OF FROGS IN WEST AFRICA: ECOLOGICAL CONSEQUENCES

MOHNEKE, Meike, Bilassé ZONGO, Jana RIEMANN, Joachim NOPPER, Joseph I. BOUSSIM & Mark-Oliver RÖDEL

Museum für Naturkunde; Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin; Invalidenstr. 43; 10115 Berlin; Germany

Amphibian populations are declining world-wide. One of the major reasons for this decline is overexploitation. All over the tropics many anuran species are caught from the wild, mainly for food, but also for medicinal purposes or the pet trade. In West Africa the frog trade seems to increase dramatically in recent years. It so far was mainly restricted to local or national scale. However, we now could also detect intense cross-border trade of frogs from Benin to Nigeria. Whereas particular West African tribes have always used frogs as food, medicine or for cultural reasons, the current increase in frog hunting seems to be new. As savanna frogs are key-species for the functioning of temporary savanna waters, their decrease or even local extinction are likely to have unforeseen and negative ecological consequences, including effects on human welfare and health. In rural savanna regions of West Africa, freshwater ecosystems are essential water resources for humans and cattle. Altering these ecosystems therefore may have important economic and health consequences. Prospective impacts on water chemistry, algae and aquatic invertebrate taxa are therefore likely. In our project we are investigating the extent, the social, socioeconomic and the ecological aspects of a probably unsustainable use of frogs in northern Benin, south-eastern Burkina Faso and Nigeria. To address these topics we carried out semi-structured interviews in different areas in the respective countries. Surveys of natural freshwater ponds were undertaken in proximity to villages where frogs are exploited and in protected areas for comparative reasons in Burkina Faso. Additionally, we set up artificial tadpole communities involving species from different trophic levels. This approach allowed us to study the effects of a tadpole species loss on species survival, algae growth, water quality and mosquito species and density. Analyses of experimental runs in 2007 and 2008 could reveal significant differences in the survival and development rate of tadpole species and in water quality. All examined tadpole species differed in their ecological roles; hence the loss of just one species might have crucial consequences for ecosystem properties in general.

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BIODIVERSITY CHANGE: PRELIMINARY MONITORING OF ANURAN SPECIES IN SELECTED VEGETATION SITES IN SOUTHWEST NIGERIA

ONADEKO, Abiodun

Department of Zoology, Faculty of Science, University of Lagos, Akoka, Lagos, Nigeria

Four study sites of different vegetation structures were selected and monitored for anuran species between 2007-2009 applying the transect sampling method. These sites were located around Ijede (060 34’ 072’’N 0030 35’ 030’’E), Ijebu Oru (060 56’ 493’’N 0030 56’ 792’’E), Onidundun (070 37’ 313’’N 0030 55’ 258’’E) and Ibapon Oyewole (080 05’ 129’’N 0040 11’ 132’’E) all in Southwest Nigeria. The study sites of Ijebu Oru (forests/abandoned farmlands) and Ibapon Oyewole (savanna) had a mean number of species of 21±0 and 14±0; the mean number of individuals 236±5.0 and 108±7.9 respectively. However at Ijede (swamps/forests), there was 18% reduction of the initial number of species recorded in 2007 due to shifting agricultural practices. *Amnirana albolabris, Aubria subsigillata* and *Ptychadena aequiplicata* were no longer accounted for in 2009 surveys. Also at Onidundun (derived savanna/forests), there was also 17% reduction of anuran species (*Ptychadena mascareniensis, Hyperolius f. burtoni* and *Arthroleptis* sp) in 2008, but 12% of these species (*Hyperolius f. burtoni* and *Ptychadena mascareniensis*) were again seen in 2009 after substantial amount of vegetation growth had occurred. The mean number of species and individuals at the study sites of Ijede and Onidundun were 16.67±1.5 and 16.67±1.5; and 203.67±6.7 and 169.67±8.3 respectively. Difference of seasonal abundance revealed that less than 50% of species observed during the rainy season are absent from the study sites during the dry season. Habitat degradation and modification are key threats to habitat loss of anuran species observed in this study. The formation of conservation sites and protected areas for anurans should be a top priority for conservationists and well wishers of the future health of the environment and adequate monitoring procedures should be employed so as to ascertain the diversity and abundance of anuran species within the selected regions which will go a long way in establishing the fact of amphibian decline, if results are compared to future monitoring surveys in similar sites.

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BIOGEOGRAPHY OF WEST AFRICAN AMPHIBIANS - INSIGHTS FROM EXTRAPOLATIONS & MODELLING

PENNER, Johannes, & Mark-Oliver RÖDEL

Museum für Naturkunde; Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin; Invalidenstr. 43; 10115 Berlin; Germany

The quest for patterns and explanations in the distribution of species is the most important aim in biogeography. Insights from such results are strongly needed for conservation actions. However, the complete distribution of species is often difficult or impossible to assess. One solution is to derive the distribution from extrapolation or modelling. We accomplished this for nearly all West African amphibian species (159) and analysed the resulting patterns. Areas of highest diversity are identified along the borders of Côte d'Ivoire & Ghana and the borders of Sierra Leone, Guinea and Liberia.

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SPATIAL RISK ASSESSMENT FOR THE AMPHIBIAN CHYTRID FUNGUS IN TROPICAL AFRICA

RÖDDER, Dennis[1], Jos KIELGAST[2], & Stefan LÖTTERS[1]

[1]Department of Biogeography, Trier University, Am Wissenschaftspark 25-27, 54296 Trier, Germany
[2]Department of Biology, Section for Microbiology and Evolution, Copenhagen University, Universitetsparken 15, 2100 Copenhagen, Denmark

Amphibians are worldwide declining at an alarming rate. Next to habitat loss, recent spread of the panzooic amphibian fungus *Batrachochytrium dendrobatidis* has been suggested to play a major role in recent population declines. Herein, we present results of a spatial explicit risk assessment for the fungus in tropical Africa highlighting areas where conservation efforts may be best employed. Results of our model are compared and verified with field data from Kenya.

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FROG NEWS FROM WEST AND CENTRAL AFRICA

Rödel, Mark-Oliver

Museum für Naturkunde; Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin; Invalidenstr. 43; 10115 Berlin; Germany

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THE AMPHIBIANS OF THE NIMBA MOUNTAINS

Sandberger, Laura, Joseph Doumbia, & Mark-Oliver Rödel

Museum für Naturkunde; Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin; Invalidenstr. 43; 10115 Berlin; Germany

The Nimba Mountains in Western Africa are one of the biodiversity hotspots. Since 2007 we investigate some aspects of the amphibians at Nimba, focusing on riparian amphibian assemblages and the viviparous Nimba toad (*Nimbaphrynoides occidentalis*). The riparian amphibian assemblages consist of different numbers of species depending on the sampled region within the area. The Nimba toads are truly viviparous (not ovoviviparous) and hence, water independent. A distinctive life-history and a patchy distribution underline the importance of ecological studies on this viviparous species. Some results of these studies will be presented.

*****

ISOLATION AND HIGH GENETIC DIVERSITY IN DWARF MOUNTAIN TOADS (*CAPENSIBUFO*) FROM SOUTH AFRICA

Tolley, Krystal

South African National Biodiversity Institute, Cape Town, South Africa

Traditional models of amphibian dispersal and gene flow point to low dispersal and high philopatry. In recent years, this traditional view has been challenged and it appears that no general model holds across taxa. Conservation of amphibians cannot be addressed on an over-arching scale, but must come on a case by case basis especially for range-restricted species where information on gene flow and migration must be incorporated into conservation efforts. The only two members of the genus *Capensibufo* Grandison (Anura: Bufonidae) are range restricted small bufonids, with distributions limited to montane areas in South Africa. We examined the genetic patterns in *C. rosei* and *C. tradouwi*, in order to understand both taxonomic and geographic boundaries, using a Bayesian analysis of two mitochondrial markers (16S and ND2). These species were not monophyletic, and demonstrate no clear taxonomic boundaries. Instead the genus is ex-

tremely diverse genetically, with distinct lineages confined to isolated mountains that represent geographic boundaries. In addition, bioclimatic modeling using MAXENT and scenarios of climatic conditions at both the present and Last Glacial Maximum suggest multiple bioclimatic and physical barriers to gene flow at present and in the past. We conclude that members of the genus have very low vagility, that current taxonomic boundaries are inadequate, and that strong geographic structuring has undoubtedly contributed to genetic diversity at the species level, rather than the population level.

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EVOLUTION OF THE MOSS FROGS (GENUS *ARTHROLEPTELLA*): FROM GENES TO CONSERVATION

TURNER, Andrew[1,2] **& Alan CHANNING**[1]

[1]*Biodiversity and Conservation Biology, University of the Western Cape, Private Bag X17, Bellville, 7535, South Africa;*
[2]*Scientific Services, Cape Nature, Private Bag X 5014, Stellenbosch, 7599, South Africa*

Moss frogs of the genus *Arthroleptella* represent an unusual pattern of evolution in South African anurans but are emblematic of the particular evolutionary history of the Cape Floristic Region. There is a general pattern of allopatry with an imprint of restricted gene flow between populations that spans the Neogene. The spatial arrangement of genetic differentiation in moss frogs echoes that found in the hyperdiverse flora of this region. Evidence of restricted gene flow was found at very fine spatial scales. Evolution of the moss frogs is tightly coupled to the evolution of their underlying habitat. This has yielded a complex array of evolutionary units for conservation management. However we can use the distribution and phylogenetic information retrieved in this study to identify species and areas of conservation priority and this is shown by the example of the rough moss frog *A. rugosa*.

*****

OSSA ANURA AFRICA AUSTRALIS
(POSTER)

VAN DIJK, Eddie

University of Stellenbosch, South Africa

There is much to be learned about the bones of African anurans. Even the intensively studied *Xenopus* (*sensu latu*) offers examples of features which were long overlooked. The peculiar mode of sound production was reported by Leslie in 1890 and overlooked for a hundred years. That the pelvis could move backwards and forwards between the ilia was discussed by Hilgendorf in 1884 and, although the phenomenon was rediscovered more than forty years later, his work seems to have been overlooked for more than a hundred years. That the anterior parts of the ilia are not parallel in Trueb's 1996 drawing of the *X. largeni* pelvis raises questions. The fluted zygapophyses of xenopodines seem to have been first recorded by Vergnaud-Grazzini in fossils in 1966. The peculiar humerus of *Xenopus* invited study, and accords with recent studies of extra-aquatic predation. The vertebral column, including the sacral diapophyses, and the pectoral girdle have received attention in classification. However, features not easily seen in dissections: X-rays or stained preparations, or even in tomographs, have often been overlooked. Thus the angles of the zygapophyses, especially anteriorly, and the inner aspect of the scapula are often not easily studied or recorded. There is evidence that there is considerable variation in zygapophyses and scapula, as well as consistency within groups. There is good reason for study and recording of individual bones. They may occur in the excreta, faeces or regurgitated pellets, and in fossils derived from these. There have been moves in educational circles to promote investigations of owl pellets as a substitute for dissections of frogs in biology classes. The poster draws attention to bones found to be of use in identification at family or generic level.

Fusions
Sacrum+Urostylus
*Xenopu*s; *Breviceps*
Sacrum+presacral vertebra (relevantly common as abnormalities, often then asymmetric)
Ptychadena
Scapula+Clavicula+Coracoideus
Hemisus
Atlas+Axis (Vertebrae V1 & V2)
Heleophrynids; *Hemisus; Breviceps*

Articulations
Neural arches of Atlas&Axis (cotyles of Atlas widely spaced)
Leptopelis, Hyperolius, Afrixalus (? not *A. spinifrons*) , *Kassina*

Ossa
Atlas
Phrynomantis; Chiromantis;Tomopterna; Phrynobatrachus widely spaced cotyles
Bufonidae; *Pyxicephalus; Ptychadena* cotyles close together, neural arch solid
Afrana; Amietia; Strongylopus; cotyles close together, gap between neural arches
Sacrum (some vary procoele/diaplasiocoele)
Heleophrynidae; Bufonidae; *Phrynomantis* procoele diapophyses expanded +, ++, +++
Phrynobatrachus diplasiooele, diapophyses directed laterally
Afrana; Amietia; Strongylopus; Pyxicephalus diplasiocoele, diapophyses angle backwards
Leptopelis; Hyperolius; Afrixalus, Kassina diplasiocoele, diapophyses angle backwards

Ilium

Phrynomantis; Brevicipitidae; Heleophyrnidae; Bufonidae shaft without ala (crest)
Xenopus acetabulum overlaps basal process, ala anteriorly with flange on shaft
Ptychadena; Afrana; Strongylopus; Arthroleptis shaft curved, ala high
Amietia (senso stricta); *Pyxicephalus* shaft curve slight, ala not high
Tomopterna shaft curve very slight, ala low, may be almost absent
Leptopelis; Hyperolius; Afrixalus; Kassina shaft curve slight, ala not high

Femur

Xenopus stout sigmoid
Afrana;Amietia; Strongylopus; Ptychadena; slender, sigmoid
Chiromantis slender, slightly sigmoid
Pyxicephalus stout, slight arch forward inflected distally, extensive ridge posterior
Phrynomantis slender, slightly sigmoid, very short ridge at proximal end, or absent
Heleophrynidae slender arch forward inflected distally, short ridge proximally
Bufonidae moderately stout, arch forward inflected distally, extensive ridge posterior
Capensibufo; slender, sigmoid
Leptopelis; Hyperolius; Afrixalus; arched forward inflected distally, short ridge proximally
Breviceps arched forward, ridges

Tibiofibula

Breviceps stout, with twist

TibulareFibulare

Breviceps stout, often held together by cartilage
Strongylopus; Hyperolius may be slight and held together by cartilage

Scapula

Breviceps distinctly forked proximally, narrow beyond fork, very elongate
Heleophrynidae, Bufonidae short, with no ridge over glenoid fossa
Afrana; Amietia; Strongylopus; Ptychadena; Pyxicephalus short, with ridge over glenoid
Kassina somewhat elongate, ridge internally over most of length
Leptopelis; Hyperolius; Afrixalus elongate, ridge internally

Coracoideus

Breviceps stout

Humerus

Xenopus complex ridges and grooves proximally, broadens distally
Breviceps stout, with tall ridge extending over most of length
Heleophyrnidae ridges proximally, very large in *Hadromophryne*
Bufonidae stout, strong ridge proximally, medial ridge high in larger species

Afrana; Amietia; Strongylopus; Ptychadena; slender, simple ridge proximally
Chiromantis slender, simple ridge, extensive
Pyxicephalus stout, with strong ridge proximally, low ridges distally laterally and medially
Leptopelis; Hyperolius, Afrixalus; Kassina very slender, with short ridge proximally

Radioulna
Breviceps stout
Leptopelis; Hyperolius; Afrixalus; Kassina slender

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THE AFRICAN AMPHIBIANS LIFEDESK, A COMMUNITY-DRIVEN RESOURCE FOR AFRICAN AMPHIBIAN DATA

ZIMKUS, Breda

Museum of Comparative Zoology, Harvard, USA

Africa remains one of the most poorly understood areas for amphibians globally, with basic data often lacking. It is therefore imperative that taxonomic data be assembled to facilitate research. Online resources, which have become essential research tools, are the easiest way to assemble and disseminate information. Building an authoritative website is important for us as a community so that all this data is both organized and accessible. I will discuss the newly created African amphibian Lifedesk (http://africanamphibians.lifedesks.org/), a tool which will allow us to develop an authoritative, community-driven resource that includes taxon pages for all African amphibians, including species descriptions, diagnoses, distributions, ecology, conservation status, photographs, and bibliography, including PDFs of pertinent literature. We hope that this to be a key resource for both the public and experts in the field, including those who may not have access to scientific journals, with data being fed directly into the Encyclopedia of Life and Amphibiaweb. Of the utmost importance is assembling high-quality taxonomic information that is reviewed by experts in the field. I will outline the number of ways by which participants can contribute to this project, including writing species descriptions, uploading images and call data, contributing PDFs that are no longer under copyright, translating species descriptions, acting as a taxonomic expert by reviewing species pages, adding recent research or newsworthy items, and participating in a forum that links researchers, individuals in the field, and amateur herpetologists.

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INSTRUCTIONS TO AUTHORS

Contributions submitted in an incorrect style (see guide-lines below) will be returned to the authors.

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** (capitals, bold, centred); **AUTHOR (S)**$^{(1,2)}$ (bold, centred); Author's address(es) (use superscripts with authors' names and addresses if more than one author); **HEADINGS** (bold, centred) and **Subheadings** (bold, aligned left) as required; **REFERENCES**, following the formats given below:

BRANCH, W.R. 1998. *Field Guide to the Snakes and Other Reptiles of Southern Africa*. Third edition. Struik, Cape Town.

BROADLEY, D.G. 1994. The genus *Scelotes* Fitzinger (Reptilia: Scincidae) in Mozambique, Swaziland and Natal, South Africa. *Ann. Natal Mus*. **35**: 237-259.

COOK, C.L., & MINTER, L.R. 2004. *Pyxicephalus adspersus* Peters, 1854. pp. 303-305, *in* Minter, L.R., Burger, M., Harrison, J.A., Braack, H.H., Bishop, P.J., and Kloepfer, D. (eds.), *Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland*. SI/MAB Series #9. Smithsonian Institution, Washington, DC.

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: **Scientific name** (including author citation); **Common name** (using Bill Branch's *Field Guide to Snakes and Other Reptiles of Southern Africa*, third edition, 1998, for reptiles; and Passmore & Carruthers' *South African Frogs*, 1995, for amphibians as far as possible): **KEYWORD** (this should be one or two words best describing the topic of the note, e.g. Reproduction, Avian predation, etc.); the **Text** (in concise English with only essential references quoted and in abbreviated form); **Locality** (Country; Province; quarter-degree locus; location; latitude and longitude if available; elevation above sea level); **Date** (day, month, year); **Collector(s); Place of deposition and museum accession number** (required if specimens are preserved). **References**, if only one or two, should be incorporated into the text; three or more references should be placed after the main text, as for Articles. **Submitted by**: **NAME**, Address.

GEOGRAPHICAL DISTRIBUTION

Brief notes of new geographical distributions (preferably at least 100 km from the nearest published record) of amphibians and reptiles on 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: **Scientific name** (including author citation); **Common name** (for sources, see Natural History Notes); **Locality** (Country; Province; quarter-degree locus; location; latitude and longitude; elevation above sea level); **Date** (day, month, year); **Collector(s)**; **Place of deposition and museum accession number** (required if specimens are preserved); **Comments**, including data on the size, colour and taxonomic characters, eg. scalation, webbing, especially for taxonomically problematic taxa; and nearest published locality record(s) in km; **References**, if only one or two, should be incorporated into the text; three or more references should be placed after the main text, as for Articles. **Submitted by**: **NAME**, Address.

Records submitted should be based on specimens deposited in a recognised collection.

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 a defined geographic unit of especial relevance to the herpetological community. For example, surveys could 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.

Survey results should be presented in the following format: **TITLE, including an indication of the survey area or locality** (country, province or state, location, quarter-degree units, or bounding latitude and longitude); **AUTHOR(S)** (format as for long articles, above) **Dates** (day, month, year); **Statement of relevance**; and **SPECIES LIST**, in tabular form comprising ***Scientific name*** (including author citation), **Location / Habitat**; **Evidence** (including registration numbers and location of vouchers); and **Comments** (where required). The note should end with a **SUMMARY** statement and **REFERENCES**.

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).

PHOTOGRAPHS AND FIGURES

Photographs and figures should be submitted as separate JPEG files, and not embedded in the text. They should preferably be 500—800 KB in size, and not more than 1.5 MB. The name of the photographer should be given, if not taken by the author or senior author of the article.

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ISSN 107-6187